

**Central and Southern Florida, Everglades Agricultural Area (EAA), Florida**

**Formerly titled: Draft Environmental Impact Statement for SFWMD Section 203**

**Everglades Agricultural Area Southern Reservoir and Stormwater Treatment Area**

**(June 2018)**

**Final Environmental Impact Statement**

**Date January 2020**



**US Army Corps  
of Engineers®**

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**Cover Sheet**  
**FINAL ENVIRONMENTAL IMPACT STATEMENT**

**Central Everglades Planning Project**

Final Environmental Impact Statement for Central and Southern Florida, Everglades Agricultural Area (EAA), Florida  
Formerly titled: Draft Environmental Impact Statement for SFWMD Section 203 Everglades Agricultural Area  
Southern Reservoir and Stormwater Treatment Area (June 2018)

**St. Lucie, Martin, Okeechobee, Glades, Hendry, Palm Beach, Broward, Miami-Dade, Monroe, Collier, Lee and  
Charlotte Counties, FL**

**Lead NEPA Agency:** **Department of Army**  
**U.S. Army Corps of Engineers, Jacksonville District**

**Abstract:**

In section 1308(a) of the Water Resources Development Act of 2018, Congress authorized the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida in accordance with section 601 of the Water Resources Development Act of 2000, as recommended in the addendum to the Central Everglades Planning Project Post Authorization Change Report (CEPP PACR), Feasibility Study and Draft Environmental Impact Statement prepared by the South Florida Water Management District (SFWMD) and dated May 2018, with such modifications as the Secretary of the Army considers appropriate. This authorization modified the New Water Phase of the Central Everglades Planning Project, which was authorized by Congress in the Water Resources Development Act of 2016. The purpose of the project is to improve the quantity, quality, timing and distribution of water flows to the Northern Estuaries, Water Conservation Area 3, Everglades National Park, and Florida Bay while increasing water supply for municipal, industrial and agricultural users to a greater extent than would be accomplished in the Central Everglades Planning Project authorized in 2016. The Preferred Alternative would change the authorized Central Everglades Planning Project to achieve these benefits by reducing the large Lake Okeechobee water management releases to the St. Lucie and Caloosahatchee estuaries by redirecting approximately 370,000 acre-feet of water on an average annual basis south through the Greater Everglades. Components of the Preferred Alternative include an above ground storage reservoir, stormwater treatment area and increased canal conveyance within the Miami and North New River canals. The Preferred Alternative would route treated water south and redistribute it across spreader canals to increase hydropattern restoration in the Greater Everglades in addition to what was provided within the 2014 Central Everglades Planning Project Final Integrated Project Implementation Report and Environmental Impact Statement (CEPP Final PIR/EIS).

This Final EIS is also being used to support a permit decision on an application from the Non-Federal Sponsor, the SFWMD, to construct and operate a component of the Preferred Alternative, the A-2 Storm Water Treatment Area. The SFWMD proposes to discharge dredged or fill material into waters of the United States in order to construct and operate the stormwater treatment area prior to execution of a Project Partnership Agreement for the project. As such, the SFWMD will need to acquire a Department of the Army permit under Section 404 of the Clean Water Act prior to construction.

Send your comments by:  
**February 24th, 2020**

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## **EXECUTIVE SUMMARY**

In section 1308(a) of the Water Resources Development Act (WRDA) of 2018, Congress authorized the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida in accordance with section 601 of the Water Resources Development Act of 2000, as recommended in the addendum to the Central Everglades Planning Project Post Authorization Change Report (CEPP PACR), Feasibility Study and Draft Environmental Impact Statement prepared by the South Florida Water Management District (SFWMD) and dated May 2018, with such modifications as the Secretary of the Army considers appropriate. This project modifies CEPP, which was authorized in WRDA of 2016. In Section 1308(b) of WRDA 2018, Congress directed that the project may be constructed only after the Secretary of the Army prepares a report that addresses the concerns, recommendations, and conditions identified in the Assistant Secretary of the Army for Civil Works (ASA(CW)) Review Assessment of the CEPP PACR dated May 2018.

## **PURPOSE AND NEED**

The ASA(CW)'s October 26, 2018 Interim Guidance for Comprehensive Everglades Restoration Plan, Central and Southern Florida, Everglades Agricultural Area, Florida directed the Corps to conduct an analysis of the project authorized in Section 1308 of WRDA 2018 "with such modifications as the Secretary considers appropriate," in accordance with the National Environmental Policy Act (NEPA). Therefore, the Corps has prepared this Final Environmental Impact Statement (Final EIS) in accordance with NEPA to evaluate and document effects of the Central and Southern Florida, Everglades Agricultural Area, Florida project on the quality of the human environment in relation to the No Action Alternative, which is CEPP as authorized in 2016. This Final EIS will also provide the NEPA to support the Corps' decision on the South Florida Water Management District' (SFWMD) application for a Department of Army permit requesting to discharge fill into waters of the United States to construct a component of the project in advance of execution of a Project Partnership Agreement for the Federal project.

## **AUTHORITY**

Congress authorized the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida in section 1308(a) of the WRDA 2018, which modifies the CEPP authorized in WRDA 2016. As authorized in 2016, CEPP provides the first increment of restoration of the central Everglades by reducing some of the discharges to the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary) and providing an average of approximately 210,000 acre-feet (ac-ft) per year of additional flow into the central portion of the Everglades. CEPP, a component of the Comprehensive Everglades Restoration Plan (CERP), was approved as a framework for restoring the south Florida ecosystem while providing for other water-related needs of the region in the WRDA 2000. CEPP presented a description of existing and expected future conditions in the south Florida ecosystem, formulation, and evaluation of plans considered to address ecosystem restoration needs in the region, analysis of environmental effects of the recommended plan, project costs, and implementation challenges.

The Corps has determined that the other authorized CEPP project features are able to accommodate the additional freshwater flows to the central Everglades that would result from this Central and Southern Florida, Everglades Agricultural Area, Florida Project. These additional flows are delivered with a timing shift that favors dry season flows when downstream infrastructure has adequate capacity to convey the flow. The project features, as authorized in WRDA 2018, include the A-2 Reservoir, Stormwater Treatment Area, and canal conveyance improvements in the New Water Phase of CEPP. The project achieves the final increments of the required storage in the EAA (CERP Component G) and freshwater flows to Northwest and Central WCA3A (CERP Component II), providing the remaining one-third of the restoration flow goal identified in CERP and in CEPP. **Table ES-1** shows CEPP project features by implementation phase.

**Table ES-1. Description of Planned Features within CEPP, as modified by the Central and Southern Florida, Everglades Agricultural Area Project**

<b>CEPP North</b>	
L-6 Diversion	
S-8 Pump Modifications	
L-4 Levee Degrade and Pump Station	
L-5 Canal Improvements	
Miami Canal Backfill	
<b>CEPP South</b>	
L-67 A Structure North	L-67 C Levee Degrade (approximately 8 miles)
L-67 C Levee Gap (6,000 feet)	Remove L-67 Extension Levee (No Backfill)
Increase S-356 capacity to 1,000 cubic feet per second	8.5 Mile Blue Shanty Levee
Increase S-333 capacity	Remove L-29 Levee Segment
L-29 Gated Spillway	Backfill L-67 Extension
L-67 A Structures 2 and 3 South	Remove Old Tamiami Trail <sup>1</sup>
L-67 A Spoil Mound Removal	
<b>CEPP New Water</b>	
Seepage Barrier L-31 N	
A-2 Reservoir and Stormwater Treatment Area	
Miami Canal and North New River Canal Conveyance Improvements	

<sup>1</sup> Removal of Old Tamiami Trail can be completed at any time during implementation but must precede backfilling of L-67 Extension Canal.

## ALTERNATIVE PLANS AND THE RECOMMENDED PLAN

Planning goals for CERP projects include enhancing ecological and economic values and social well-being. These three goals were considered during the formulation of alternative plans in the 2014 CEPP Final PIR/EIS and within the CEPP PACR; and project-specific objectives and constraints were established to evaluate the plans. In general, ecosystem restoration objectives focused on capturing freshwater releases from Lake Okeechobee that historically have been sent to the St. Lucie and Caloosahatchee estuaries and providing additional water to the Greater Everglades. In this Final EIS, the quantity, timing, and distribution of flows to the Northern Estuaries and the quantity, quality, timing, and distribution of flows to the Greater Everglades were evaluated; as well as the ability of the plans to maintain existing levels of flood control service and water supply for municipal, agricultural, and Tribal use.

The CEPP PACR plan formulation strategy consisted of a formulation phase that followed the natural, pre-drainage, southerly flow of water from Lake Okeechobee through the Everglades ecosystem to Florida Bay. The strategy involves the formulation of canal conveyance, above-ground storage, and treatment wetlands that serve to reduce damaging discharges to the Northern Estuaries and restore the central portions of the Everglades by utilizing the CEPP North and South project features to improve flow to Water Conservation Area 3A (WCA 3A), WCA 3B, Everglades National Park (ENP) and Florida Bay consistent with both CEPP and CERP. The plan formulation framework considered conveyance, aboveground storage, and wetland treatment measures within the EAA consistent with the CERP and CEPP, to capture, store, and deliver water south to the Greater Everglades.

### **PREFERRED ALTERNATIVE**

The CEPP New Water Modification alternative (Alternative 3) in this Final EIS is the Preferred Alternative, for the federal project and the permit action. Alternative 3 consists of a 240,000 ac-ft reservoir (10,500 acres of storage) with multi-purpose operational flexibility, a STA with a treatment area of 6,500 acres, and conveyance improvements that would provide benefits to more than 1.5 million acres in the St. Lucie and Caloosahatchee estuaries, WCA 3A, WCA 3B, ENP, and Florida Bay (**Figure ES-1**). The CEPP New Water Modification alternative has been optimized to address the ASA(CW)'s concerns, recommendations, and conditions described in the Review Assessment. These changes to the CEPP PACR Recommended Plan (Alternative 2) included minor design modifications to reduce seepage, manage offsite impacts, and ensure water quality benefits. A Potential Failure Mode Analysis (PFMA) made recommendations to be incorporated during Pre-Construction, Engineering and Design (PED). The project's minor design refinements, which occurred between publication of the draft EIS in May 2018 and this Final EIS and resulted in a new alternative (Alternative 3), were not substantial changes that are relevant to environmental concerns. In addition, after considering the analyses and modeling that has been completed on the project since the publication of the draft EIS, the Corps has determined that there is no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. Therefore, a supplemental Draft EIS is not warranted. The minor design refinements are further discussed in Section 3 of this Final EIS.

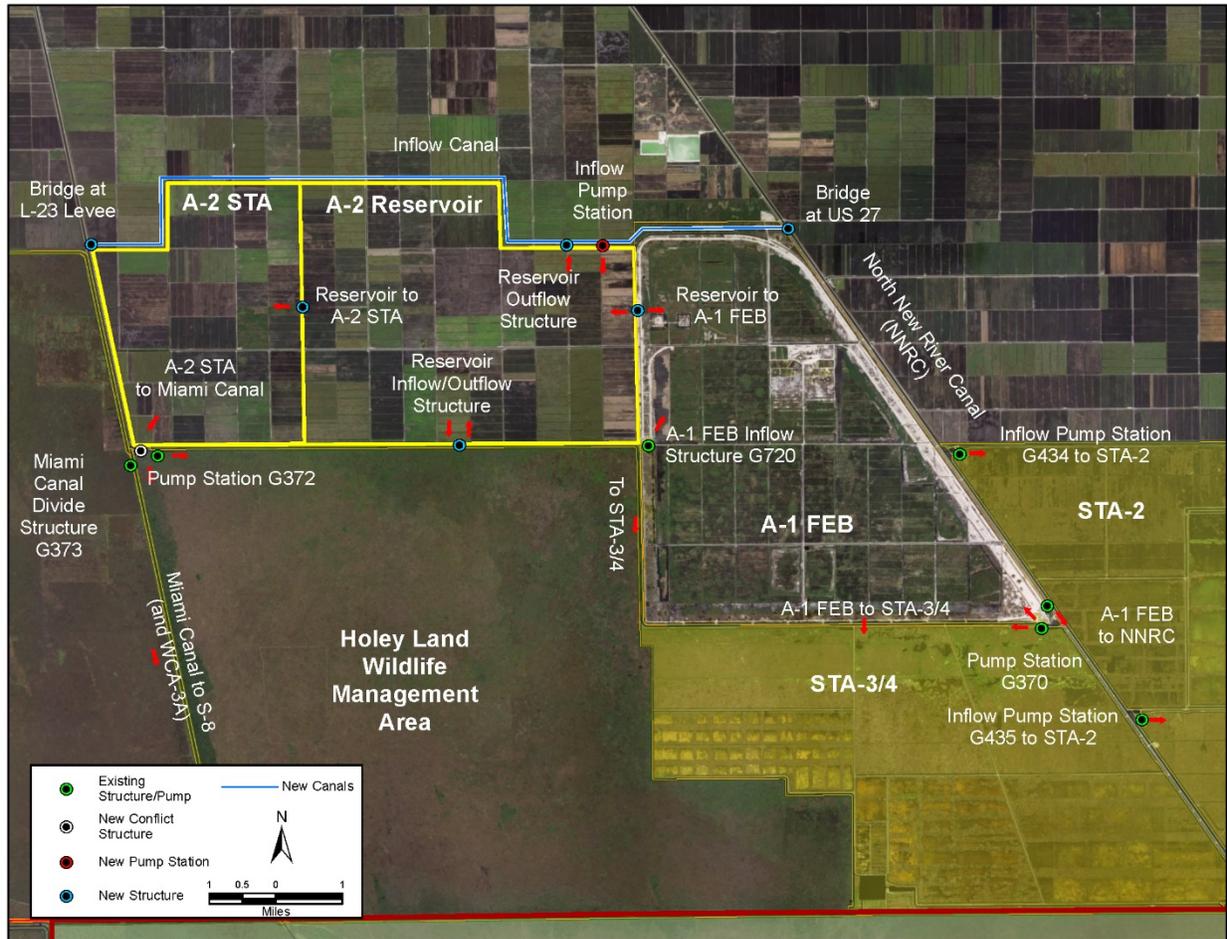


Figure ES-1. Preferred Alternative – CEPP New Water Modification

### COORDINATION WITH AGENCIES AND PUBLIC

The SFWMD held six project scoping meetings in both West Palm Beach (4) and Clewiston (2) to engage the public in scoping of key issues to be addressed in development of the alternatives. Notices of the meetings were published in the Florida Administrative Weekly. The scoping meeting and comment period was identified as an open process utilized to define the purpose and need of the action (or project), identify any issues, determine the project point of contact, establish the project schedules, and provide recommendations to the agency.

A NEPA scoping letter dated April 16, 2018 was used to invite comments from Federal, State, and local agencies, federally recognized Indian Tribes, and other interested private organizations and individuals. Scoping comments were accepted through May 1, 2018. A Notice of Intent (NOI) to prepare a Draft EIS for the SFWMD Section 203 Preferred Alternative was published in the Federal Register (FR Volume 76, Number 232) on April 16, 2018. Public meetings were held on June 26, 27, and 28 of 2018. A Notice of Availability of the Draft EIS for a 45-day public review period was published in the Federal Register on June 8, 2018, with letters announcing the public release, along with a Press Release on June 8, 2018. The Corps, Regulatory Division placed the SFWMD’s application for a permit to construct the A-2 STA component on

public notice on September 5, 2019, for a 30-day comment review period. An additional opportunity for public review is being provided on this Final EIS.

## **ENVIRONMENTAL CONCERNS AND AREAS OF CONTROVERSY**

The ASA(CW) reviewed the CEPP PACR Recommended Plan to determine whether it complies with Federal law and regulation, to make a determination on the study's feasibility, and to identify any conditions or recommendations. Pursuant to Section 1308(b) of WRDA 2018, prior to the project's construction, the Secretary is required to address the concerns, recommendations, and conditions of the ASA(CW)'s Review Assessment. The Corps has completed the analyses and modeling required to do so and incorporated minor changes into the project originally presented in the Section 203 Study. The changes discussed in the Final EIS respond to new information resulting from the potential seepage and dam safety analysis, water quality modeling, and concerns from the Miccosukee Tribe of Indians of Florida. These concerns are briefly described below:

- **Water Supply** –Additional water supply may be available for agricultural/municipal water supply with the CEPP New Water Modification, but the purpose of the reservoir is environmental restoration and water supply for the environment receives first priority.
- **Planning and Policy** – During the 2014 CEPP study process, the Corps and SFWMD considered a reservoir and screened it out early (see 2014 CEPP Final PIR/EIS for details) due to the cost benefit ratio. Subsequently, the SFWMD, under Laws of Florida, Chapter 2017-10, was mandated to evaluate a reservoir CEPP PACR, without screening the alternative for cost. The CEPP PACR planning process was restricted with regard to lands under Laws of Florida, Chapter 2017-10, which prohibited the use of eminent domain. The Corps planning process would not include such constraints.
- **Water Quality** – The expected benefits from the CEPP New Water Modification include improvements on the health of the Caloosahatchee and St. Lucie estuaries due to the reduced potential for freshwater releases from Lake Okeechobee. However, there is a potential for slightly degraded water quality in the Everglades Protection Area resulting from releasing Lake Okeechobee water to WCA 3A if the STA features do not perform as expected. Water quality modeling was used by the SFWMD to determine how implementation of the Preferred Alternative would impact water quality, and as with any modeling, there are uncertainties and associated risks that water quality results during implementation of the project do not match what was predicted. The Corp's review of the Dynamic Model for Stormwater Treatment Areas version 2 water quality model used to analyze the CEPP New Water Modification verified that appropriate assumptions were used by the SFWMD to simulate phosphorus treatment in the system, and that modeling uncertainties were reduced to the maximum extent practicable. Based on this analysis, the WQBEL for water discharged from the A-2 STA is expected to be achieved. A conservative modeling approach coupled with reasonable assurance measures including a NPDES permit issued to the SFWMD, monitoring, and adaptive management are included as project components designed to reduce risks associated with modeling uncertainty to a tolerable level and provide reasonable assurances that negative impacts to water quality will not occur due to implementation of the CEPP New Water Modification.

- **Tribal** – The Miccosukee Tribe has a Federal Reservation and leased lands within the northern portion of WCA 3A. Due to the proximity of the CEPP New Water Modification to these lands, the Tribe has expressed concerns over the conversion of the FEB to a deep-water storage reservoir south of Lake Okeechobee. In a letter from the Miccosukee Tribe to the SFWMD dated January 8, 2018, the Miccosukee Tribe states that FEBs provide “critical water quality benefits” that a deep reservoir cannot provide. The Miccosukee Tribe expressed concern that discharges from the STA will not meet the Tribal Water Quality Standard of 10 parts per billion (ppb) total phosphorus (TP) or less. The Tribe supports the CERP and the restoration of the Everglades; however, the Tribe believes that Everglades’ restoration should require “more clean water”. The Miccosukee Tribe asserts that the lack of water flow across Tamiami Trail has caused “discriminatory flooding of Tribal lands” and that the CEPP New Water Modification will cause more flooding of polluted water within their reservation and leased lands. The Miccosukee Tribe recommends that the de-compartmentalization of the Everglades through construction of CEPP, the opening of the S-12 gates, and the maintenance of culverts on the L-67 and L-29 levees take priority over construction of the CEPP New Water Modification. Responses to the Miccosukee Tribe’s concerns are found in Section 5 of the Final EIS.
- **Engineering** – The Engineering Appendix of the CEPP PACR represents a limited level of design, but includes documentation of all engineering assumptions and conceptual designs. Congressional authorization in WRDA 2018 directed the Secretary to address the Review Assessment concerns, recommendations, and conditions. All work has been coordinated and reviewed between the USACE and the SFWMD to ensure that the work meets USACE guidance, standards, and regulations, and incorporates, as applicable, SFWMD design guidance. Additional information is located in Section 5 and Annex C of this Final EIS.

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## 1 INTRODUCTION

The purpose of this Final Environmental Impact Statement (Final EIS) is to evaluate potential effects on the human environment of the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida authorized in section 1308(a) of the Water Resources Development Act of 2018. This Final EIS is also being used to support a permit decision on a Department of the Army application [application number SAJ-2018-03427(SP-KDS)] submitted on August 6, 2019, from the Non-Federal Sponsor, the South Florida Water Management District, to construct and operate a component of the Preferred Alternative, the A-2 Stormwater Treatment Area.

Congress authorized the Federal project in accordance with section 601 of the Water Resources Development Act of 2000, as recommended in the addendum to the Central Everglades Planning Project Post Authorization Change Report (CEPP PACR), Feasibility Study and Draft Environmental Impact Statement prepared by the South Florida Water Management District (SFWMD) and dated May 2018, with such modifications as the Secretary of the Army considers appropriate. As described in section 1308 of the Water Resources Development Act of 2018, the project was authorized subject to certain requirements that must be completed prior to construction of the project:

*(a) Authorization.--Subject to subsection (b), the Secretary is authorized to carry out the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida, in accordance with section 601 of the Water Resources Development Act of 2000 (114 Stat. 2680), as recommended in the addendum to the Central Everglades Planning Project Post Authorization Change Report, Feasibility Study and Draft Environmental Impact Statement prepared by the South Florida Water Management District and dated May 2018, with such modifications as the Secretary considers appropriate.*

*(b) Requirement.--*

*(1) In general.--The project authorized by subsection (a) may be constructed only after the Secretary prepares a report that addresses the concerns, recommendations, and conditions identified by the Secretary in the review assessment titled "Review Assessment of South Florida Water Management District's Central Everglades Planning Project, Section 203 Post Authorization Change Report, Integrated Feasibility Study and DRAFT Environmental Impact Statement (March 2018, Amended May 2018)" and dated May 2018.*

*(2) Expedited completion.--The Secretary shall expedite the completion of the report under paragraph (1) and shall complete report not later than 90 days after the date of enactment of this section.*

*(c) Consultation.--In reviewing the report identified in subsection (a), and completing the report identified in subsection (b), the Secretary shall consult with the South Florida Water Management District on any project modifications.*

*(d) Consideration.--Nothing in this section shall be construed to delay the design, construction, and implementation of components and features of the project for ecosystem restoration, Central Everglades, authorized by section 1401(4) of the Water Resources Development Act of 2016 (130 Stat. 1713), that are not directly affected by the project authorized by subsection (a).*

The project modifies the New Water Phase of the Comprehensive Everglades Restoration Plan (CERP), Central Everglades Planning Project (CEPP), which was authorized by Congress in the Water Resources Development Act of 2016. Therefore, the Preferred Alternative described in this Final EIS is titled the “CEPP New Water Modification” alternative. Pertinent background information on the CERP, CEPP, and the **CEPP PACR** and associated environmental documentation are incorporated by reference in an effort to avoid duplication of documents. The 2014 CEPP Final PIR/EIS is located online here:

[http://www.saj.usace.army.mil/Portals/44/docs/Environmental/CEPP/01\\_CEPP%20Final%20PIR-EIS%20Main%20Report.pdf](http://www.saj.usace.army.mil/Portals/44/docs/Environmental/CEPP/01_CEPP%20Final%20PIR-EIS%20Main%20Report.pdf)

The CEPP PACR, including appendices and updated sections of appendices are located in Annex A and Annex C of this Final EIS.

As described in the 2014 CEPP Final PIR/EIS and authorized in 2016, CEPP would store, treat, and redirect approximately 210,000 acre-feet (ac-ft) of water on an average annual basis to the historical Everglades ecosystem in lieu of releasing the excess water from Lake Okeechobee through the St. Lucie Canal (east) and the Caloosahatchee Canal (west) to the coastal estuaries (referred to as the Northern Estuaries). The improvements included in the 2014 CEPP Final PIR/EIS would deliver approximately two-thirds of the additional flow estimated to be provided by the CERP to the central portion of the Everglades.

### **1.1 Project Purpose and Need**

The purpose of the project is to provide additional storage, treatment, and conveyance in the Everglades Agricultural Area beyond what was authorized in CEPP in 2016, to further reduce water management releases from Lake Okeechobee to the Northern Estuaries, and to deliver water essential to Everglades’ restoration, consistent with CERP performance goals.

Since congressional authorization of CEPP in WRDA 2016, the State of Florida has experienced excessive rainfall well above average, resulting in greater releases from Lake Okeechobee to the Northern Estuaries than in an average rainfall year. The rainfall experienced in the months of June 2017, September 2017, and October 2017 was approximately 190% greater than the average rainfall expected for these months due in large part from Tropical Storm Philippe and Hurricane Irma (**Figure 1-1**). As a result of the greater than average rainfall in 2017, Florida Governor, Rick Scott, declared a state of emergency under Executive Orders (E.O.) 16-59, 16-155, and 16-156.

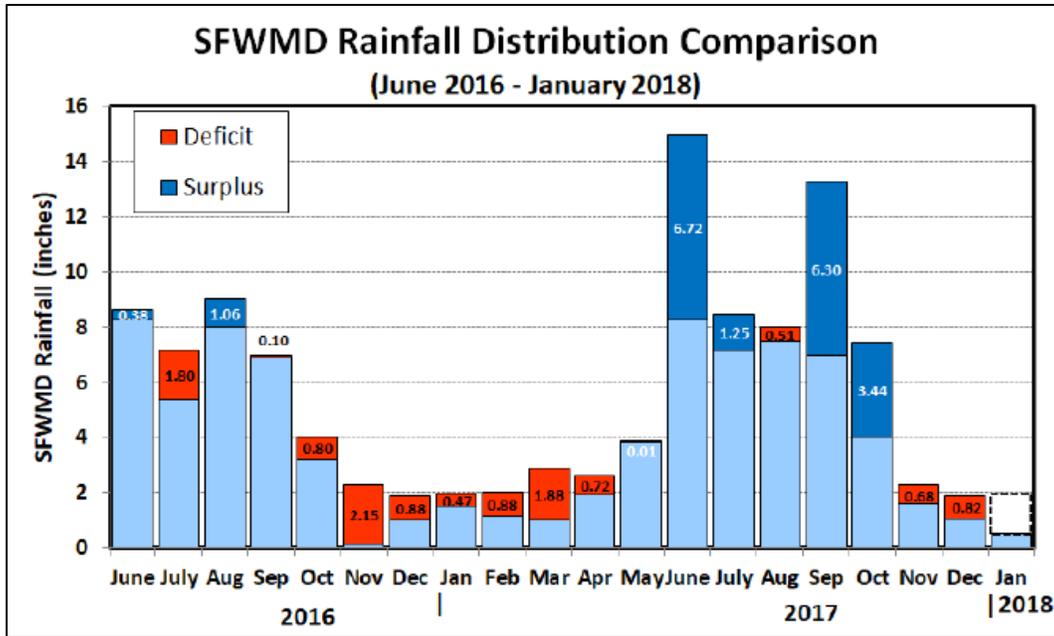


Figure 1-1. Lake Okeechobee Water Level Comparison for SFWMD Area Wide Monthly Rainfall from June 2016 to January 2018

Immediately following the Governor’s Executive Orders, the Florida State Legislature passed the Water Resources Law of 2017 (Laws of Florida, Chapter 2017-10, formerly known as Senate Bill 10). The law, signed by the Governor May 9, 2017, directed the SFWMD to pursue an expedited process to provide increased storage, treatment capacity, and conveyance in the Everglades Agricultural Area (EAA) jointly with the U.S. Army Corps of Engineers and consistent with CERP. The SFWMD is the state agency responsible for water resources management in south Florida and acts as the non-Federal sponsor for Federal water resources projects, including CERP.

SFWMD proposes to construct and operate the stormwater treatment area component of the project prior to execution of a Project Partnership Agreement for the Federal project. As such, the SFWMD will need to obtain a Department of the Army permit under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 prior to construction.

The SFWMD has applied for a Department of the Army (DA) permit pursuant to Section 404 of the Clean Water Act (CWA) to discharge dredged or fill material into waters of the United States in order to construct and operate the stormwater treatment area. In addition, a Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) authorization because the project includes work that may affect the course, location, control, or capacity of a navigable Water of the United States. A public notice for the proposed project was posted on September 5, 2019. The project purpose as described by the SFWMD is to construct the stormwater treatment area component of the project recommended within the June 2018 Draft EIS. The SFWMD further described that the STA is needed to ensure that the recommended plan can comply with State Water Quality Based Effluent Limits. The SFWMD stated that prior to the USACE completing the reservoir, the STA will be used to treat a portion of the Everglades Agricultural Area runoff and Lake Okeechobee discharge from the Miami Canal prior to returning it to the Miami Canal. Although permit

applicants are encouraged to provide a statement of the proposed activity's purpose and need from their perspective, ultimately, the USACE, will in all cases exercise independent judgment in defining the purpose and need for the project from both the applicant's and the public's perspective. An applicant's project purpose cannot be so narrow as to eliminate all other alternatives from consideration. For actions subject to NEPA, where the USACE is the permitting agency, the analysis of alternatives required for NEPA environmental documents will in most cases provide the information for the evaluation of alternatives under the Section 404(b)(1) Guidelines; on occasion, however, the NEPA document may address a broader range of alternatives.

This Final EIS is intended to serve two purposes: 1) consider the impacts of the Federal Civil Works project authorized in WRDA 2018 on the human environment, and 2) consider the impacts of the construction and operation of the stormwater treatment area as described in the SFWMD's Section 404 and Section 10 permit application and subsequent additional information on the human environment. The overall project purpose of the regulatory action is improve the quality of water flows to the central Everglades (Water Conservation Area 3 and Everglades National Park) and Florida Bay. In addition, if the Corps constructs the proposed A-2 Reservoir, the overall project purpose would include improvement of the quantity, quality, timing and distribution of water flows to central Everglades (Water Conservation Area 3 and Everglades National Park), and Florida Bay while increasing water supply for municipal, industrial, and agricultural users. The SFWMD's preferred alternative per the permit application is the same as the STA described in this Final EIS's preferred alternative.

## 1.2 Study AREA

The study area (**Figure 1-2**) for this project is the same area as the area analyzed in the 2014 CEPP Final PIR/EIS: the Northern Estuaries (St. Lucie River and Indian River Lagoon and the Caloosahatchee River and Estuary), Lake Okeechobee, the EAA, the Water Conservation Areas (specifically WCAs 2 and 3), Everglades National Park (ENP), the Southern Estuaries (specifically focused on Florida Bay), and portions of the Lower East Coast (LEC) (See **Table 1-1** in the CEPP PACR (page 1-13), Annex A for written descriptions of the area).

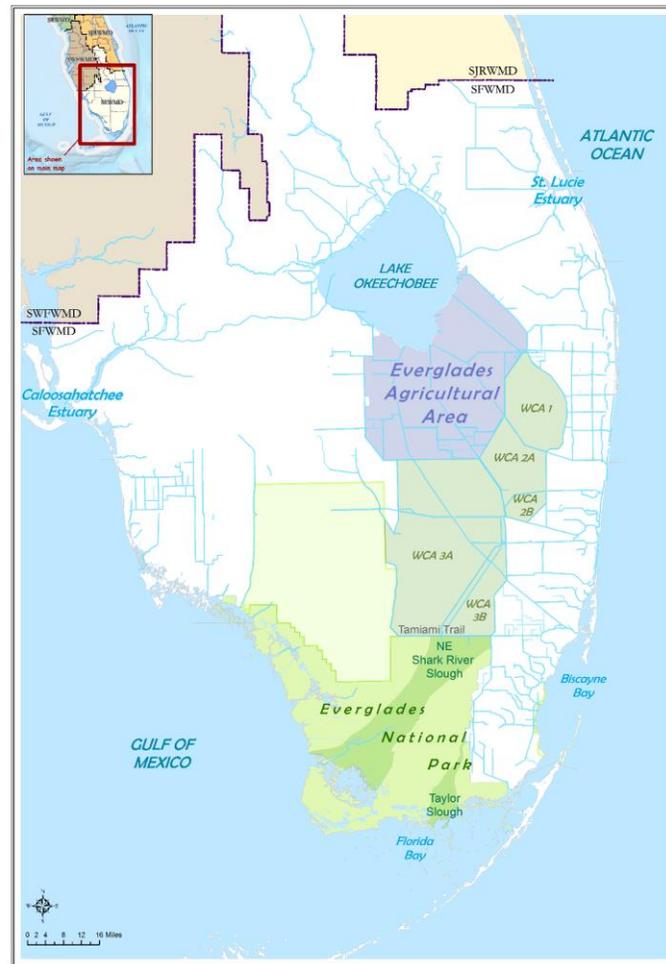


Figure 1-2. CEPP PACR Study Area

### 1.3 Purpose: Objectives and Constraints

This subsection discusses objectives of, and constraints on, CERP, CEPP, and the CEPP PACR.

#### 1.3.1 CERP, CEPP, and CEPP PACR Objectives

CERP was authorized in WRDA 2000 and Section 601(h) of WRDA 2000 states “[t]he overarching objective of the Plan [CERP] is the restoration, preservation, and protection of the South Florida Ecosystem while providing for other water-related needs of the region, including water supply and flood protection.” These same objectives are applied to all CERP projects, including CEPP study efforts and SFWMD applied them to the CEPP PACR (Table 1-1).

The CEPP PACR objectives are the same as the 2014 CEPP Final PIR/EIS Objectives listed in the table. In Section 1308 of WRDA 2018, Congress authorized the Corps to “carry out the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida, in accordance with section 601 of the Water Resources Development Act of 2000 (114 Stat. 2680), as recommended in the addendum to the Central Everglades Planning Project Post Authorization Change Report, Feasibility Study and Draft Environmental Impact Statement prepared by the South Florida Water Management District and dated May 2018, with such modifications as the Secretary considers appropriate.”

Table 1-1. Objectives of CERP, 2014 CEPP Final PIR/EIS, and CEPP PACR

<b>CERP Objective</b>	<b>2014 CEPP Final PIR/EIS Objective</b>	<b>CEPP PACR Objective</b>
<b>CERP Goal: Enhance Ecological Values</b>		
Improve habitat and functional quality	Reduce high-volume discharges from Lake Okeechobee to improve the quality of oyster and SAV habitat in the Northern Estuaries	Same as 2014 CEPP Final PIR/EIS
Improve habitat and functional quality	Restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades System	Same as 2014 CEPP Final PIR/EIS
Improve habitat and functional quality	Improve sheetflow patterns and surface water depths and durations in the Everglades system in order to reduce soil subsidence, the frequency of damaging peat fires, the decline of tree islands, and salt water intrusion	Same as 2014 CEPP Final PIR/EIS
Increase the total spatial extent of natural areas	No corresponding CEPP objective; consider this objective in future increments	No corresponding objective
Improve native plant and animal species abundance and diversity	Reduce water loss out of the natural system to promote appropriate dry season recession rates for wildlife utilization	No corresponding objective
Improve native plant and animal species abundance and diversity	Restore more natural water level responses to rainfall to promote plant and animal diversity and habitat function	Same as 2014 CEPP Final PIR/EIS
<b>CERP Goal: Enhance Economic Values and Social Well-Being</b>		
Increase availability of fresh water (agricultural/municipal & industrial)	Increase availability of water supply	Increase availability of water supply
Reduce flood damages (agricultural/urban)	No corresponding CEPP objective; consider this objective in future increments	No corresponding objective
Provide recreational and navigation opportunities	Provide recreational opportunities	Provide recreational opportunities

CERP Objective	2014 CEPP Final PIR/EIS Objective	CEPP PACR Objective
Protect cultural and archeological resources and values	Protect cultural and archeological resources and values	Protect cultural and archeological resources and values

### 1.3.2 CERP, CEPP, and CEPP PACR Constraints

In developing its CEPP PACR, SFWMD included constraints consistent with CERP to ensure that the CEPP PACR's Recommended Plan would not reduce the level of service for flood protection, not eliminate or transfer existing legal water supply users, and would meet applicable water quality standards for the natural system.

In accordance with the Savings Clause provisions of the CERP authorization in WRDA 2000 (Sections 601(h)(4) and (5)) and applicable State and Federal standards, SFWMD applied the following constraints to the CEPP PACR, many of which were included in the 2014 CEPP Final PIR/EIS planning and implementation:

- Not reduce levels of service for flood protection that were in existence on the date of enactment of WRDA 2000
- Not eliminate or transfer existing legal sources of water until a new source of comparable quality and quantity is available
- Meet applicable State water quality standards
- Not affect the Tribal Compact

In addition, unlike CERP planning but consistent with direction in Florida Law Chapter 2017-10, SFWMD limited land acquisition to acquisitions on a "willing seller" basis. Under the FL Law 2017-10:

"The Legislature declares that acquiring land to increase water storage south of the lake is in the public interest and that the governing board of the district may acquire land, if necessary, to implement the EAA reservoir project with the goal of providing at least 240,000 acre-feet of water storage south of the lake. The use of eminent domain in the EAA for the purpose of implementing the EAA reservoir project is prohibited."

## 1.4 Decision to Be Made

This Final EIS assesses potential environmental effects on the human environment as they relate to the project as authorized by Congress and the SFWMD's proposed project. The decision to be made is whether to approve the No Action Alternative (Alternative 1), the CEPP PACR Recommended Plan (Alternative 2), or the CEPP New Water Modification (Alternative 3). The No Action Alternative (Alternative 1) is the future without project condition, which is CEPP as authorized in 2016. The CEPP PACR Recommended Plan (Alternative 2) is SFWMD's Preferred Alternative as presented in the application. The primary differences between the No Action Alternative and the CEPP PACR Recommended Plan are the conversion of the 14,000 acre CEPP A-2 Flow Equalization Basin to a 10,500 storage acre reservoir and the addition of a

Stormwater Treatment Area (STA) with treatment area of 6,500 acres to work in tandem with existing state operated STAs to treat the additional volume of water associated with the CEPP PACR Recommended Plan. The CEPP PACR Recommended Plan's project footprint also includes the additional 3,000 acres necessary to accommodate a 6,500-acre STA. The CEPP New Water Modification (Alternative 3) also includes a 10,500 acre storage reservoir and a 6,500 acre STA but with minor design refinements to mitigate off-site seepage impacts. These design refinements include a secondary seepage collection canal and changing the Cutoff wall material soil-bentonite to soil-cement bentonite.

In addition, this Final EIS is a comprehensive environmental analysis of the permit application for the STA project that would meet the project purpose as defined by the USACE. This Final EIS is the primary document to satisfy NEPA and the Council of Environmental Quality Regulations (CEQ, 40 CFR Parts 1500-1508) as well as the Corps' Procedures for Implementing NEPA (Engineering Regulation 200-2-2). It also evaluates applicable federal laws, executive orders, and federal regulations as well as applicable state laws and regulations. Under Section 2 [42 USC subsection 4321] of the NEPA, the purposes of the Act are: "To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation" (NEPA 1969). The NEPA also mandates an open process for the public to be informed about the proposed project, the environmental consequences, and the agency's decision.

The Proposed Action would result in the discharge of fill in 280 acres of waters of the United States (tributaries including canals and ditches) and excavation of 230 acres of wetlands and could have potential significant effects on the human environment. Under Section 404 of the CWA (33 USC 1344), the USACE is responsible for regulating the placement of fill and discharge of dredged material in the waters of the United States, including tributaries to those waters, as well as wetlands adjacent to those waters. Therefore, because the SFWMD is seeking approval of a permit from the USACE, a federal agency, the project involves a federal action. The scope of the federal permitting action includes all of the SFWMD project components (33 CFR 325) described in its application. Based on review of this EIS, the USACE will make a decision to either issue, issue with conditions, or deny a permit for the Proposed Action. The USACE will render a permit decision under Section 404 of the CWA for discharge of fill material (including permanent inundation) within federal jurisdictional areas and waters of the United States. A separate Record of Decision will be completed to support the permit decision.

The Proposed Action, through the USACE permit review requires consultation under Section 7 of the ESA and Section 106 of the National Historic Preservation Act. Additionally, the Proposed Action would involve evaluation for compliance with the Section 404 (b)(1) Guidelines of the CWA; the Magnuson-Stevens Fishery Conservation and Management Act; Section 401 of the CWA; and the Coastal Zone Management Act consistency. Consultation and coordination, including public involvement, are included in Section 5 of this Final EIS. Also, permits, licenses, and consultation requirements for the project are further described in Section 5 of this Final EIS.

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## 2 EXISTING CONDITIONS/AFFECTED ENVIRONMENT

The existing conditions of this project largely remain the same as listed in the **2014 CEPP Final PIR/EIS, Section 2 and Appendix C.1** of the 2014 CEPP Final PIR/EIS are available upon request, or online: <http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/>. In addition, the existing conditions within the project area are also documented within the **CEPP PACR in Section 2.0, Table 2-1** and in further detail within the **CEPP PACR, Appendix C.1 as the Future Without Project (FWO) condition**. The information presented in these two documents is hereby incorporated by reference within this Final EIS.

During review of SFWMD's permit application, a site-specific evaluation was completed for the STA footprint to determine the extent and condition of the existing aquatic environment. The existing conditions are described in the following sections are based on SFWMD's August 6, 2019, permit application and supporting documents. The STA project site is a 6,500-acre parcel comprised of active and fallow sugarcane fields with uplands, open water (canals and ditches), and one wetland.

### 2.1 Aquatic

The STA footprint has approximately 283 acres of agricultural canals and shallow ditches run north to south and east to west within the 6,500-acre STA project footprint. Open water dominates the center channel, with sparse coverage of floating vegetation such as water hyacinth and water lettuce. Canal banks are covered with herbaceous and shrubby vegetation including common ragweed, frogfruit, torpedograss, smutgrass, beggar tick, saltbush, Brazilian pepper, sugar cane, and castor bean. The canals and ditches are regularly maintained to ensure water management of the adjacent farm fields. During maintenance the dredged material is often sidecast adjacent to the ditches and canals. The open waters are currently managed for agriculture, seasonal water elevations typically vary between elevation 3.6 feet (NAVD) and 8.1 feet (NAVD).

### 2.2 Wetlands

The 230-acre wetland system consists of a previously farmed area that has been abandoned since 2004 and since the area became fallow, the area has reverted to wetland. Vegetation within the wetland includes a variety of invasive and non-invasive grass and shrub species including Common reed (*Phragmites australis*), Torpedo grass (*Panicum repens*), Carolina Willow (*Salix carolinensis*), and Napier grass (*Pennisetum purpureum*). Other plants present within the STA project area consist of facultative-wet species adapted to life in saturated conditions. The wetland contains hydric soils which appear to stay saturated through most of the wet season.

### 2.3 Uplands

The upland land uses within the project site consist of berms and levees constructed from spoil dredged from the adjacent ditches. Access dirt roads and trails exist on the top of the berms and levees. The predominant vegetation observed sparingly throughout the upland areas consists of Broom grass (*Andropogon virginicus*), Knotroof Bristlegrass (*Setaria geniculata*), Wiregrass (*Aristida stricta*), Saw

palmetto (*Serenoa repens*), Cabbage palms (*Sabal palmetto*), Bull Thistle (*Cirsium vulgare*), Bahia grass (*Paspalum notatum*), Crowfoot grass (*Dactyloctenium aegyptium*), and Slash pine (*Pinus elliotii*).

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### 3 ALTERNATIVES

The plan formulation framework of the CEPP PACR considered conveyance, aboveground storage, and wetland treatment alternatives within the EAA consistent with the CERP and CEPP, to capture, store, and deliver water south to the Greater Everglades. That alternatives analysis is incorporated by reference. As the STA proposed in the regulatory application has the same project purpose as the STA that is part of the civil works project, the alternatives analysis will support the permit decision as well.

The alternatives considered would modify project components associated with the New Water Phase of CEPP. The 2014 CEPP North and South project components for redistributing water within WCA 3A, creating additional hydrologic connectivity between WCA 3A, WCA 3B, and ENP, and effectively managing seepage along the eastern boundary of the Everglades, were re-evaluated during the preparation of the CEPP PACR and determined to be robust enough to accommodate the additional timing shifts and flow volumes that would be delivered by the alternative plans for New Water project components evaluated in the CEPP PACR and in this Final EIS.

#### 3.1 Alternatives Plan Formulation Strategy for the 2014 CEPP Final PIR/EIS and CEPP PACR

In the 2014 CEPP Final PIR/EIS, deep storage on the A-1 and A-2 parcels was screened out during the formulation process due to the high cost to benefit ratio. The 2014 CEPP Final PIR/EIS partially addressed the established CERP goals of restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. These goals will be achieved by delivering treated new water to the natural system and reducing water management releases to the Northern Estuaries (St. Lucie and Caloosahatchee). A larger reservoir and STA configuration was considered during the 2014 CEPP Final PIR/EIS planning process. However, at that time “the deep reservoir storage was not brought forward (for detailed analysis) due to unacceptable cost levels associated with the large increase in both storage and treatment capacity required to provide greater delivery of water to the Everglades” (2014 CEPP Final PIR/EIS, Section 3.4, page 3-39). The rationale for eliminating a deep storage reservoir option from further study focused almost entirely on the total cost associated with the delivery of additional water to the Everglades that would be necessary to fully achieve the CERP goal. When the 2014 CEPP Final PIR/EIS was prepared, the decision to eliminate based on the high cost was appropriate and focused on delivering an increment of storage and flows delivered south to the Everglades. Since then, there have been several concurrent years of well above average rainfall in both the wet and dry seasons that resulted in more frequent Lake Okeechobee releases to the estuaries. These events highlighted the need to expedite CERP projects that would focus on reducing these water management releases.

In screening out the deep storage reservoir measure as cost prohibitive, the 2014 CEPP Final PIR/EIS developed the first increment of restoration to obtain early benefits consistent with the 2006 Committee for the Independent Scientific Review of Everglades Restoration Progress biennial report recommendation to use an incremental adaptive restoration approach. It also focused on providing ecological benefits by restoring flows to the central Everglades and less on benefits from reducing water management releases to the St. Lucie and Caloosahatchee. A deep storage reservoir with greater capacity and operational flexibility is more beneficial than a shallow FEB if the project purpose includes reducing freshwater

releases to the estuaries over a shallow FEB. The CEPP PACR reevaluated CEPP to determine if modifications could be made to address the need to reduce Lake Okeechobee water management releases to the estuaries while also taking steps to meet CERP goals.

The 2014 CEPP Final PIR/EIS (Section 6.9.9, page 6-84) noted that future increments of CERP might include additional storage in the EAA:

*“The A-2 FEB does not preclude future increments of CERP planning for additional storage in the EAA ... For example, the A-2 FEB could be converted to an STA or deeper reservoir and STA that works in conjunction with the State’s existing STA system to accommodate any future upstream storage to further increase water deliveries to the WCAs ... CEPP is not seeking the deauthorization of the CERP EAA Reservoir Phase – I, recognizing that improvements will need to be considered in future increments of CERP that provide additional storage for capturing water currently being sent to tide from Lake Okeechobee... Future CERP increments that provide this additional storage will increase water made available in the regional system.”*

As described in the 2014 CEPP Final PIR/EIS (Section 6.9.1), the National Academy of Sciences (National Resource Council 2007) recommended the implementation of CERP through an incremental adaptive restoration (IAR) process. That section of the CEPP Final PIR/EIS discusses how CEPP adopted that recommendation and formulated a solution for an increment of overall restoration of the south Florida ecosystem, but would not meet all targets of CERP. Incidentally, there are problems and opportunities that remain. Although CEPP provided a significant increase in freshwater needed for the restoration of the central Everglades, the CEPP Final PIR/EIS states that additional actions are needed to achieve the restoration envisioned in the CERP Yellow Book. The actions include further reducing freshwater management releases from Lake Okeechobee to the St. Lucie and Caloosahatchee Estuaries and improving estuary habitat for oysters and submerged aquatic vegetation (SAV).

### **3.1.1 Incremental Implementation**

It is important to view the incremental implementation of CERP from the perspective of Everglades restoration goals and objectives. This project incorporates the National Research Council (NRC) recommendation that the implementation of CERP projects should provide some immediate restoration benefits while addressing scientific uncertainties. The CEPP New Water Modification described in this Final EIS is not a “comprehensive” solution leading to the end state resolution of problems existing in the Everglades ecosystem, but will provide meaningful progress toward restoration of the study area, including achieving the redirection of restoration flows to the natural areas as identified in the CERP and greatly reducing the potential for further degradation. The planning and design of project features incorporated flexibility and robustness to ensure compatibility with future Everglades restoration efforts.

### **3.1.2 CEPP PACR Plan Formulation**

The CEPP PACR identified management measures, both structural and non-structural, and determined their feasibility. The management measures that were retained underwent a screening analysis to evaluate, optimize, refine, and group management measures into Alternative Plans. More information on

this process can be found in Annex A of this Final EIS (CEPP PACR – Appendix E). The alternatives were formulated and evaluated based on their ability to: 1) contribute to the goals and purpose of CERP, and 2) provide benefits that justify costs on a next-added increment basis.

The Everglades is a complex ecosystem comprising multiple physical and biological elements whose functions and responses are highly interdependent. The Everglades lies at the center of the complex South Florida regional water management system in which water distributed to any part of the system affects other parts. To achieve incremental restoration of the central Everglades ecosystem, management measures and components cannot be evaluated in isolation, but must be combined and evaluated. The CEPP PACR alternative plan formulation, modeling, and evaluation strategies acknowledged that the storage and conveyance of water, the distribution of water, and seepage management are interacting, interdependent elements that must work together to advance restoration.

The alternative plan formulation strategy for the CEPP PACR included the formulation of interdependent aboveground storage reservoirs, treatment wetlands (aka Stormwater Treatment Areas or STAs), and conveyance improvements south of Lake Okeechobee that would serve to reduce high-volume freshwater discharges from Lake Okeechobee to the Northern Estuaries and redirect the flows to the Greater Everglades, including WCA 3 and ENP. The alternative plan formulation process used data and findings developed in previous and ongoing plan formulation efforts including CERP planning and restoration initiatives, EAA Reservoir Phase I, WCA 3 Decompartmentalization and Sheetflow (Decomp), ENP Seepage Management, CEPP, and the ongoing Lake Okeechobee Watershed Restoration Project (LOWRP) and Western Everglades Restoration Project (WERP) planning studies.

Plan formulation built upon work conducted in the authorized Central and Southern Florida Project Comprehensive Everglades Restoration Plan (Yellow Book), Everglades Agricultural Reservoirs Project Study, and the authorized CEPP, and included a detailed analysis for conveyance, storage and treatment measures in the in the EAA. The Everglades Agricultural Reservoirs (G) in the Comprehensive Everglades Restoration Plan (Yellow Book Alternative) includes aboveground reservoirs with a total storage capacity of approximately 360,000 ac-ft located in the EAA and conveyance capacity increases for the Miami Canal and North New River Canal. The initial design assumed 60,000 acres, divided into three, equally sized compartments (1, 2, and 3) providing 120,000 ac-ft each. The final size, depth, and configuration of this facility in the Restudy were left to be determined through more detailed planning and design.

### **3.1.3 Yellow Book Alternative Analysis**

The Yellow Book version of the EAA storage reservoir (component G) consisted of three compartments each 120,000 acres and up to 6 feet deep for a total storage of 360,000 acre-ft. Five alternatives were evaluated ranging in depth from 6-14 ft and acres of land ranging from 62,000 to 26,500 acres. The 2006 draft EAA study evaluated these alternatives using the South Florida Water Management Model and screened out the Yellow Book alternative because it removed more prime and unique farmland, had higher socioeconomic impacts, and was not as cost effective due to real estate costs. The 2014 CEPP PIR/EIS built upon the former EAA study and previously considered an extensive range of project alternatives during the original plan formulation of CEPP, and that alternatives analysis is incorporated by reference. To facilitate the evaluation of thousands of possible combinations of measures in the 2014

CEPP Final PIR/EIS, screening criteria were developed to select the array of measures and plans for detailed modeling and evaluation. The 2014 CEPP Final PIR/EIS at Section 6.9.9 and Appendix E described how CERP (Yellow Book) components were evaluated and built upon in developing CEPP. The screening level analysis evaluated 27 alternative combinations ranging from 4-12 ft deep, acreage combinations of reservoir, STA, FEB totaling 28,000 acres. Two cost-effective measures were identified: 1. 28,000 FEB maximum depth of four feet was the least cost to provide 200,000 acre-ft of water south and 2. 12 ft deep reservoir of 21,000 acres and a 7,000 acre STA to deliver 240,000 acre-ft of water south to the Everglades. The 28,000 acre FEB (14,000 acre CEPP cost-shared A-2 FEB and 14,000 acre state owned and operated A-1 FEB) providing approximately 120,000 acre-ft of storage and approximately 210,000 acre-ft of flow was selected because the cost for that component was a quarter of the deep reservoir cost.

**3.1.4 Siting of Project Features**

Identification of an acceptable storage and treatment location governed the range and scale of management measures that were considered in the CEPP PACR plan formulation process. Storage and treatment locations were identified based on the results of siting analyses conducted during previously completed CERP planning activities and reaffirmed during the development of CEPP, which included consideration of regional geographic location and a specific project footprint.

After considering the possible regional geographic areas, the specific location for the storage and treatment management measures was identified based on the criteria listed in **Table 3-1**.

**Table 3-1. CEPP PACR siting criteria for locating storage and treatment features**

Infrastructure	Socio-Political and Environmental	Hydrology	Construction Efficiency
<ul style="list-style-type: none"> <li>• Use of existing major canal networks (Miami Canal, Bolles &amp; Cross Canal and North New River Canal)</li> <li>• Proximity to move water from water source (Lake Okeechobee)</li> <li>• Proximity to existing public works (STAs, existing pump stations, roads, minor canal networks)</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid unwilling sellers, no eminent domain authority in EAA (for purposes of implementing the EAA reservoir project)</li> <li>• Minimize impacts to local tax rolls</li> <li>• Use lands already acquired for the purpose of environmental restoration</li> <li>• Minimize effects on cultural resources</li> <li>• Use previously impacts lands</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce freshwater releases to the Northern estuaries</li> <li>• Hydraulic connection to Lake Okeechobee with flexibility to manage high water levels</li> <li>• Improve the timing of environmental releases to the WCAs</li> </ul>	<ul style="list-style-type: none"> <li>• Topography</li> <li>• Muck depths</li> <li>• Construction and maintenance access</li> <li>• Seepage management</li> <li>• Availability of construction material</li> </ul>

### 3.1.5 CEPP PACR Final Array of Alternatives

The CEPP PACR plan formulation evaluation and screening of management measures resulted in a final array of five alternatives. The features within these alternatives were formulated to maximize the use of publicly owned lands within the EAA. The A-1 and A-2 parcels and the A-2 Expansion Area, which is approximately 34,500 acres combined, is the largest footprint and will accommodate the features needed to achieve the project's goals and objectives. While screening management measures and alternatives based on the siting of features solely on publicly owned lands does not follow the typical Federal planning process, the use in this case reflects language within the CEPP PACR and the directive of Senate Report 106-362 on Title VI of WRDA 2000, which states:

*"Lands for the construction of this component have been acquired by the South Florida Water Management District through the purchase and exchange of the Talisman Sugar Corporation properties through funds provided by the Department of the Interior.*

*The Army Corps should maximize use of the lands acquired through the Talisman purchase and exchange, as well as other EAA lands held by the non-Federal Sponsor, in the design and construction of this project feature. Further, the Corps should seek to take full advantage of the Talisman lands by maximizing the depth of water stored in the Talisman Water Storage Reservoir."*

Congress also identified, in Section 601(b)(2)(C)(ii) of WRDA 2000, the Phase-1 EAA Storage Reservoir Project as "an aboveground reservoir(s) with a total storage capacity of approximately 240,000 acre-feet located on land associated with the Talisman Land purchase in the Everglades Agricultural Area." Use of the Talisman A-2 Parcel in the CEPP PACR alternative analysis allows the cost-effective use of adjacent State-owned infrastructure that includes the A-1 FEB (15,000 acre facility), the STA 3/4 (16,300 acre facility), and STA-2 (15,500 acre facility). There is no assurance that acquisition of private land the size of A-2 parcel would be in any proximity to this State-owned infrastructure, making the project costs increase substantially due to not only the additional land acquisition costs but also the need for major additional supporting infrastructure and the operational flexibility it provides. Assuming private lands adjacent to the publically owned lands could be acquired, siting features on these lands would cause detrimental effects to the public through the loss of agricultural lands and a loss of local tax revenue.

The following alternatives, sited on the A-1 and A-2 parcels and the A-2 Expansion Area, were considered in the CEPP PACR final array of Alternatives:

**R240A** – Alternative R240A includes a 240,000 ac-ft aboveground reservoir and a 6,500-acre STA, located on the A-2 parcel and A-2 Expansion area that will work in conjunction with the existing 60,000 ac-ft A-1 FEB, STA-2, and STA-3/4 to meet State water quality standards. The proposed A-2 East Reservoir is 10,500 acres and designed to have a normal full storage water depth of approximately 23 feet. This alternative also includes 1,000 cfs of additional conveyance capacity in the Miami Canal within the EAA and 200 cfs of additional conveyance capacity in the North New River Canal within the EAA. For this alternative, A-2 East Reservoir outflows can be sent to the new A-2 West STA (located adjacent to and directly west of the A-2 East Reservoir), to the existing A-1 FEB, to the existing STA-2, and/or to the existing STA-3/4. Outflows

from the A-2 West STA would be conveyed via a conflict structure to convey water under the STA 3/4 Inflow Canal to the Miami Canal south of the existing G-373 divide structure. A-2 East Reservoir outflows can also be conveyed to either the Miami or North New River Canals via the intake canal.

Alternative R240A also includes an intake canal located adjacent to and directly north of the A-2 West STA, the A-2 East Reservoir, and the A-1 FEB. The intake canal extends from the Miami Canal to the North New River Canal, which allows flexibility to convey water into the reservoir from either side of the project area. A new inflow pump station conveys water into the A-2 East Reservoir from the intake canal.

**R240B** - Alternative R240B includes a 240,000 ac-ft aboveground reservoir and a 6,500-acre STA, located on the A-2 parcel and A-2 Expansion area that will work in conjunction with the existing 60,000 ac-ft A-1 FEB, STA-2 and STA-3/4 to meet State water quality standards. The proposed A-2 West Reservoir is 10,500 acres and designed to have a normal full storage water depth of approximately 23 feet. This alternative also includes 1,000 cfs of additional conveyance capacity in the Miami Canal within the EAA and 200 cfs of additional conveyance capacity in the North New River Canal within the EAA. For this alternative, A-2 West Reservoir outflows can be sent to the new A-2 East STA (located adjacent to and directly east of the A-2 West Reservoir), to the existing A-1 FEB (via the existing STA-3/4/A-1 FEB inflow canal), to the existing STA-2, and/or to the existing STA-3/4. Outflows from the A-2 East STA would be conveyed to the Miami Canal south of the existing G-373 divide structure via a new east-west A-2 East STA outflow canal located adjacent to and directly south of the A-2 West Reservoir. A-2 West Reservoir outflows can also be conveyed to either the Miami Canal via a reservoir outflow structure or to the North New River Canal via the intake canal.

Alternative R240B also includes an intake canal located adjacent to and directly north of the A-2 West Reservoir, the A-2 East STA, and the A-1 FEB. The intake canal extends from the Miami Canal to the North New River Canal, which allows flexibility to convey water into the reservoir from either side of the project area. A new inflow pump station conveys water into the A-2 West Reservoir from the intake canal.

**R360C** - Alternative R360C includes a 360,000 ac-ft aboveground reservoir and an 11,500-acre STA, located on the A-1 parcel, the A-2 parcel, and the A-2 Expansion area, that will work in conjunction with the existing STA-2 and STA-3/4 to meet State water quality standards. The proposed A-1 Reservoir and A-2 East Reservoir are 20,500 acres combined and designed to have a normal full storage water depth of approximately 18 feet. For this alternative, the existing 16,500-acre shallow A-1 FEB is modified to a reservoir. This alternative also includes 1,000 cfs of additional conveyance capacity in the Miami Canal within the EAA and 200 cfs of additional conveyance capacity in the North New River Canal within the EAA. For this alternative, A-1 Reservoir and A-2 East Reservoir outflows can be sent to the new A-2 West STA (located adjacent to and directly west of the A-2 East Reservoir), to the existing STA-2, and/or to the existing STA-3/4. Outflows from the A-2 West STA would be via a conflict structure to convey water under the STA 3/4 Inflow Canal to the Miami Canal south of the existing G-373 divide structure. A-1 Reservoir outflows can be conveyed to the North New River Canal via a reservoir outflow structure and A-2 East Reservoir outflows can be conveyed to either the Miami or North New River Canals via the intake canal.

Alternative R360C also includes an intake canal located adjacent to and directly north of the A-2 West STA, the A-2 East Reservoir and the A-1 Reservoir. The intake canal extends from the Miami Canal to the

North New River Canal, which allows flexibility to convey water into the reservoir from either side of the project area. A new inflow pump station conveys water into the A-1/A-2 East Reservoir from the intake canal.

**R360D** - Alternative R360D includes a 360,000 ac-ft aboveground reservoir and an 11,500-acre STA, located on the A-1 parcel, the A-2 parcel, and the A-2 Expansion area, that will work in conjunction with the existing STA-2 and STA-3/4 to meet State water quality standards. The proposed A-2 Reservoir and the A-1 North Reservoir are 20,500 acres combined and designed to have a normal full storage water depth of approximately 18 feet. For this alternative, the existing 16,500-acre shallow A-1 FEB is modified to be a 11,500-acre STA in the south (A-1 South STA) and a 3,500-acre reservoir in the north (A-1 North Reservoir). This alternative also includes 1,000 cfs of additional conveyance capacity in the Miami Canal within the EAA and 200 cfs of additional conveyance capacity in the North New River Canal within the EAA. For this alternative, A-1 North Reservoir, and A-2 Reservoir outflows can be sent to the new A-1 South STA, to the existing STA-2, and/or to the existing STA-3/4. Outflows from the A-1 South STA would be conveyed to the Miami Canal south of the existing G-373 divide structure via a new east-west A-1 South STA outflow canal located adjacent to and directly south of the A-2 Reservoir. A-1 North Reservoir outflows can be conveyed to the North New River Canal via a reservoir outflow structure and A-2 Reservoir outflows can be conveyed to the Miami Canal via a reservoir outflow structure.

Alternative R360D does not include an intake canal along the north boundary of the project area and instead includes two inflow pump stations, one located at the northeast corner of the A-1 North Reservoir that would convey water from North New River Canal and one located at the northwest corner of the A-2 Reservoir that would convey water from the Miami Canal. Having separate inflow pump stations allows flexibility to convey water into the A-1 North Reservoir and A-2 Reservoir from either side of the project area.

**C360C** - Alternative C360C includes the exact same storage, treatment, and conveyance improvements and related infrastructure as Alternative R360C above. However, Alternative C360C includes additional operational flexibility and can serve multiple purposes including environmental benefits and other water related needs as identified in Component G of the CERP.

The final array of alternatives was screened based on the Principles and Guidelines criteria, effectiveness, acceptability, completeness, and efficiency. Alternative R240A was determined to be the most cost effective plan considered in the CEPP PACR that achieved the CEPP PACR objectives. Alternative R240A was refined and further modeled to optimize its performance based on the operational protocols included in the C360C alternative to become C240A. The alternative formulation and screening process described in the CEPP PACR are incorporated by reference and can be found in Annex A of this Final EIS (CEPP PACR, Sections 3 and 4).

The CEPP PACR built of the 2014 CEPP PIR analysis with a goal of further reducing Lake Okeechobee water releases to the estuaries and maximizing flows south to the Everglades. The CEPP PACR evaluated four alternative plans and the no-action plan using hydrologic simulation model outputs, with two alternatives using operational optimization and two alternatives that were the same overall storage of 360,000 acre-ft (Alt. R360C and Alt. R360D), as the Yellow Book alternative for the EAA reservoir (see Section 4 of the

CEPP PACR). These alternatives differed from the Yellow Book alternative in terms of reservoir depth of 18 ft over 20,500 acres and a 11,500 acre STA because the CEPP PACR alternative formulation was constrained by the ability to site the features on lands currently under public ownership.

Performance measures were used to evaluate the degree to which proposed alternative plans met restoration targets representative of pre-drainage conditions. Planning-level cost estimates were developed for the four alternative plans, ecosystem restoration benefits were calculated, and additional selection criteria were applied. The 2014 CEPP Final PIR/EIS Alternatives and Plan Formulation Strategy are available online:

<http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/>.

The CEPP recommended plan, as authorized in Section 1401 WRDA 2016 (Public Law 114-322) proposed to implement only a portion of the Yellowbook flows to the Everglades by providing 210,000 ac-ft of additional flow. The CEPP PACR recommended plan aligns with the CERP Yellow Book component G (EAA Reservoir) of delivering approximately 300,000 ac-ft of additional flow to the Everglades using less storage 240,000 ac-ft compared to 360,000 ac-ft and lower average annual incremental cost of \$2,564 per average annual habitat unit compared to \$3,029 per average annual habitat unit for the 360,000 ac-ft reservoir. As stated in the CEPP PACR, Alternative 1 total cost was \$2,169,471,700 and, Alternative 2 is \$3,600,902,087., and Alternative 3 cost which will likely increase over the Alternative 2 total and incremental costs during the project design phase as a result of differences in labor rates, cost of materials and construction methods.

The alternatives considered in this EIS, in support of the CEPP PACR and the ASA(CW) Review Assessment, three alternatives will be considered: Alternative 1 – No Action (Alt4R2 2014 CEPP Final PIR/EIS), Alternative 2 – CEPP PACR Recommended Plan (C240A), and Alternative 3 – CEPP New Water Modification (C240A with design refinements).

### **3.1.6 Alternatives Considered in Detail**

Consistent with previous CERP planning efforts, the storage and treatment management measures south of Lake Okeechobee are recommended to be located on and maximize the usage of the A-1 and A-2 parcel, both of which are owned in fee by the SFWMD, pursuant to the Talisman Exchange. Selection of a suitable location for the new storage and treatment measures included in this Final EIS considered the following: 1) direction from Congress in Senate Report 106-362 on Title VI of WRDA 2000 to maximize use of the lands acquired through the Talisman purchase and exchange for the EAA Reservoir Storage Project; 2) the lack of private lands of the size needed that were in proximity to existing State-owned infrastructure; 3) avoidance of substantial Project cost increases due to additional land acquisition costs and/or the need for major additional supporting infrastructure; 4) minimizing the impacts on Prime and Unique Farmland; 5) minimizing socio-economic impacts; and 6) other Environmental Justice (EJ) concerns (Section 4). The current project that was authorized under Section 1308 of WRDA 2018 modifies the CEPP (authorized under WRDA 2016). The extensive formulation processes conducted during the development of the 2014 CEPP Final PIR/EIS and the CEPP PACR considered an extensive array of alternatives for the CERP project; they are incorporated by reference in this document. Alternatives analyzed within this Final EIS are the No Action Alternative (2014 CEPP Final PIR/EIS), the CEPP PACR Recommended Plan (Alternative 2), and

the CEPP New Water Modification (Alternative 3), which addresses the concerns, recommendations, and conditions identified by the Secretary in the Review Assessment. This is further described below, and analyzed through the NEPA process throughout this document.

CEPP, as authorized in 2016, did not preclude future increments of CERP for additional storage in the EAA and the 2014 CEPP Final PIR/EIS documented that the A-2 FEB could be converted to an STA or deeper storage to increase water deliveries to the Everglades (**2014 CEPP Final PIR/EIS Section 6.9.9 page 6-84**). Similarly, the A-1 FEB was designed and constructed to allow for modification by leaving land available on the project site to provide for higher levees and deeper storage.

As recognized in the 2014 CEPP Final PIR/EIS, “It is anticipated that the need for modifications to the 2008 Lake Okeechobee Regulation Schedule (LORS) will be initially triggered by non-CEPP actions and that these actions will occur earlier than implementation of CEPP. Therefore, the CEPP Final PIR/EIS will not be the mechanism to propose or conduct the required NEPA evaluation of modifications to the LORS.” (2014 CEPP PIR/EIS, page 6-2).

### 3.1.7 No Action Alternative – 2014 CEPP Final PIR/EIS (Alt4R2)

The 2014 CEPP Final PIR/EIS authorized plan, known as Alt4R2 is the No Action Alternative. The CEPP PACR assumed that all components within Alt4R2 will be constructed as detailed in the 2014 CEPP Final PIR/EIS, Section 6, and in **Table 3-2** below. The SFWMD described the Future Without Project Condition (FWO) as the CEPP Alt4R2. There are references to the FWO within this document because of the evaluation the SFWMD completed, and in this regard it is the same as the No Action Alternative. A summary of the features are included below in text and in **Figure 3-1**.

**Table 3-2. No Action Alternative – 2014 CEPP Final PIR/EIS (Alt4R2) Conditions**

Category	No Action Alternative – 2014 CEPP Final PIR/EIS (Alt4R2)
Status of Non-CERP Projects	Construction completed and features operated: C-111 South Dade (Contracts 8 and 9); C&SF C-51 West End Flood Control Project; Kissimmee River Restoration; SFWMD Restoration Strategies (Central Flow Path features); DOI Tamiami Trail Modifications Next Steps Project (5.5 miles of additional bridges); Seepage Barrier Near the L-31 N Levee (Miami-Dade Limestone Products Association); MWD Project features including existing condition components plus Tamiami Trail Modifications (1-mile eastern bridge) are constructed. However, no operational changes for the L-29 Canal stage, G-3273 constraint, or the S-356 pump station were represented in the FWO project condition.
Status of CERP Projects	Construction completed and features operated: IRL-S Project; Picayune Strand Restoration Project; Site 1 Phase 1 Project; BBCW Phase I Project; Broward County WPA Project; Caloosahatchee River (C-43) West Basin Storage Reservoir; C-111 Spreader Canal Western Project; Central Everglades Planning Project as authorized in WRDA 2016
Operations Plan for WCA 3A, ENP and the SDCS	ERTP (2012) with CEPP operations, including Rainfall Driven Operations; L-29 Canal maximum operational stage limit: 9.7 ft. NGVD; G-3273 constraint: 9.5 ft. NGVD.
Operational Plan for Lake Okeechobee	2008 LORS with CEPP Operations; ongoing Lake Okeechobee System Operations Manual (LOSOM) planning process

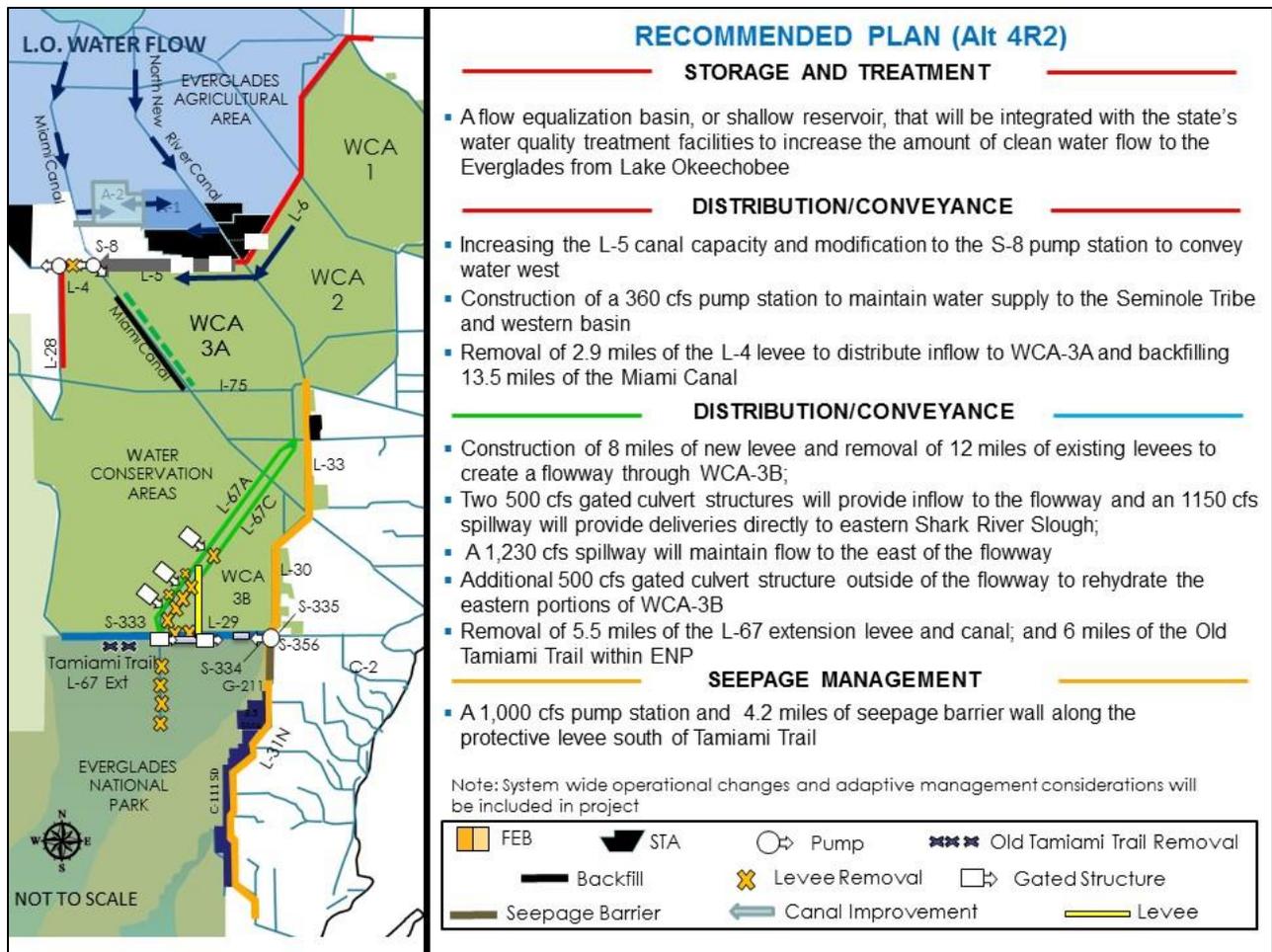


Figure 3-1. No Action Alternative – 2014 CEPP Final PIR/EIS Alt4R2

**3.1.7.1 Everglades Agricultural Area (EAA) (North of the redline)**

EAA includes construction and operations to divert, store and treat Lake Okeechobee regulatory releases. Storage and treatment of new water would be possible with the construction of a 14,000 acre Flow Equalization Basin (FEB) and associated distribution features on the A-2 footprint that would be operationally integrated with the State-owned and State-constructed A-1 FEB and existing STAs. The A-2 FEB would accept EAA runoff and a portion of the Lake Okeechobee water currently discharged to the Northern Estuaries. This Lake Okeechobee water would be diverted to the FEB when FEB/STAs and canals have capacity. The C-44 Reservoir (CERP component) also collects water that would go to the St. Lucie Estuary, and, under the No Action Alternative, the reservoir would be operated to return a portion of this water back to Lake Okeechobee, from which water could be delivered to the FEB or used to provide water supply deliveries.

CEPP benefits gained from sending new water south from Lake Okeechobee are derived in part from operational refinements that can take place within the existing, inherent flexibility of the 2008 LORS, and in part with refinements that are beyond the schedule's current flexibility. Modifications to 2008 LORS would be required to optimally utilize the added storage capacity of the A-2 FEB to send the full 210,000

acre-feet (ac-ft) per year of new water available in CEPP south to the Everglades, while maintaining compliance with the Savings Clause requirements in Section 601 of WRDA 2000 related to water supply and maintenance of flood protection.

The hydrologic modeling conducted for all 2014 CEPP Final PIR/EIS alternatives to optimize system-wide performance incorporated the current Regulation Schedule management bands of the 2008 LORS. The hydrologic modeling of the 2014 CEPP Final PIR/EIS alternatives included proposed revisions to the 2008 LORS flow chart guidance of maximum allowable discharges, which are dependent on the following criteria:

- Class limits for Lake Okeechobee inflow and climate forecasts, including tributary hydrologic conditions, seasonal climate outlook, and multi-seasonal climate outlook
- Stage level, as delineated by the Regulation Schedule management bands
- Stage trends (whether water levels are receding or ascending)

Most of the 2008 LORS refinements applied in the 2014 CEPP Final PIR/EIS modeling lie within the bounds of the operational limits and flexibility available in the current 2008 LORS, with the exception of the adjustments made to the class limits for the Lake Okeechobee inflow and climate forecasts. Under some hydrologic conditions, the class limit adjustments made to the Lake Okeechobee inflow and climate forecasts reduced the magnitude of allowable discharges from the Lake, thereby resulting in storage of additional water in the Lake in order to optimize system-wide performance and ensure compliance with Savings Clause requirements. However, these class limit changes represent a change in the flow chart guidance that extends beyond the inherent flexibility in the current 2008 LORS. As detailed in the **CEPP Final PIR/EIS, subsection 6.8.2.1**, the recommended plan operations also expand on the 2008 LORS backflow operations to Lake Okeechobee through the following operational changes: (1) backflow to Lake Okeechobee from the C-44 Canal is allowed when S-308 is not open for regulatory discharge and the stage in Lake Okeechobee is below 14.5 feet (ft.) National Geodetic Vertical Datum (NGVD) (no seasonal variability); and (2) discharges from the Indian River Lagoon-South Project C-44 Reservoir to the C-44 Canal are made when the stage in Lake Okeechobee is below the baseflow zone of the 2008 LORS schedule to provide an additional source of backflow water to Lake Okeechobee. Additional information and documentation of the recommended plan modeling assumptions for Lake Okeechobee operations are found in the **2014 CEPP Final PIR/EIS Appendix A**.

Independent of the implementation of CEPP as authorized in 2016, there is an expectation that revisions to the 2008 LORS would be needed following the implementation of other CERP projects and Herbert Hoover Dike (HHD) infrastructure remediation. The USACE expects to operate under the 2008 LORS until there is a need for revisions due to the earlier of either of the following actions: (1) system-wide operating plan updates to accommodate CERP “Band 1” projects (“Band 1” projects are defined in **2014 CEPP Final PIR/EIS, subsection 2.5**), as described in **2014 CEPP Final PIR/EIS, subsection 6.1.3.2**, or (2) completion of sufficient HHD remediation for reaches 1, 2, and 3 and associated culvert improvements, as described in **2014 CEPP Final PIR/EIS, subsection 2.5.1**. Section 1106 of WRDA of 2018 requires the Corps to “expedite completion of the Lake Okeechobee regulation schedule to coincide with completion of the Herbert Hoover Dike project . . . .” The Corps anticipates that a new regulation schedule, referred to as the Lake Okeechobee System Operating Manual (LOSOM), will be completed by 2022 to coincide with the

completion of HHD rehabilitation construction. When HHD remediation is completed and the HHD Dam Safety Action Classification (DSAC) Level 1 rating is lowered, higher maximum lake stages and increased frequency and duration of high lake stages may be possible to provide the additional storage capacity assumed with the recommended plan. **Figure 3-1** provides a summary of the features included in the No Action Alternative – 2014 CEPP Final/EIS Alt4R2.

### 3.1.7.2 WCA 2A and Northern WCA 3A (South of the Redline)

WCA 2A and Northern WCA 3A includes conveyance features to deliver and distribute existing flows and the redirected Lake Okeechobee water through WCA 3A. Backfilling 13.5 miles of the Miami Canal between I-75 and 1.5 miles south of the S-8 pump station, and removing 2.9 miles of the southern L-4 Levee west of the S-8 pump station are the key features needed to ensure spatial distribution (i.e., improved sheetflow) and flow directionality of the water entering WCA 3A.

Conveyance features to move water into and through the northwest portion of WCA 3A include: a gated culvert to deliver water from the L-6 Canal to the remnant L-5 Canal, a new gated spillway to deliver water from the remnant L-5 Canal to the western L-5 Canal (during L-6 diversion operations); a new gated spillway to deliver water from STA 3/4 to the S-7 pump station during peak discharge events (eastern flow route is not typically used during normal operations), including L-6 diversion operations; approximately 13.6 miles of conveyance improvements to the L-5 Canal; a new 360 cfs pump station to move water within the L-4 Canal to maintain water supply deliveries to retain the existing functionality of STA-5 and STA-6 and maintain water supply to existing legal users, including the Seminole Tribe of Florida; and new gated culverts and an associated new canal to deliver water from the Miami Canal (downstream of S-8, which pulls water from the L-5 Canal) to the L-4 Canal, along with potential design modifications to the existing S-8 and G-404 pump stations.

The Miami Canal would be backfilled to approximately 1.5 ft. below the peat surface of the adjacent marsh. Spoil mounds on the east and west side of the Miami Canal from S-8 to I-75 would be used as a source for Miami Canal backfill material. Refuge for mammals and other upland species would continue to be provided by the retention of 22 of the highest priority Florida Fish and Wildlife Conservation Commission (FWC) enhanced spoil mounds between S-339 (located approximately 10 miles south of S-339) to I-75 and the creation of additional upland landscape (constructed tree islands) approximately every mile along the entire reach of the backfilled Miami canal section (S-8 to I-75) where historic ridges or tree islands once existed. The constructed tree islands would block flow down the backfilled canal due to the tree island having a profile across the landscape that varies, or undulates, in elevation. Miami Canal constructed tree island design details would be determined during CEPP preconstruction, engineering and design (PED) phase. Tree island design, construction, and planting would be coordinated with appropriate science team members with expertise in these topics to accomplish the restoration vision and intent of CEPP's canal backfilling and tree island construction. A diverse array of species would be planted, including trees, shrubs, and herbaceous species that are appropriate for these tree islands. Additional details are located in **2014 CEPP Final PIR/EIS Appendix A. Figure 3-1** provides a summary of the features included in the No Action Alternative – 2014 CEPP Final/EIS Alt4R2.

### 3.1.7.3 Southern WCA 3A, WCA 3B, and ENP (Green/Blue Lines)

Southern WCA 3A, WCA 3B, and ENP includes conveyance features to deliver and distribute water from WCA 3A to WCA 3B and ENP. A new Blue Shanty Levee extending from Tamiami Trail northward to the L-67A Levee would be constructed. This Blue Shanty Levee would divide WCA 3B into two subunits, a large eastern unit (3B-E) and a smaller western unit, the Blue Shanty flow-way (3B-W). A new levee is the most efficient means to restore continuous southerly sheetflow through a practicable section of WCA 3B and alleviates concerns over effects on tree islands by maintaining lower water depths and stages in WCA 3B-E. The width of the 3B-W flow-way is aligned to the width of the downstream 2.6-Mile Tamiami Trail Next Stepsbridge, optimizing the effectiveness of both the flow-way and bridge. In the western unit, construction of two new gated control structures on the L-67A, removal of the L-67C and L-29 Levees within the flow-way, and construction of a gated spillway in the L-29 Canal would enable continuous sheetflow of water to be delivered from WCA 3A through WCA 3B-W to ENP. A third gated control structure in the L-67A Levee and associated gap in the L-67C Levee, both outside the flow-way, would improve the hydroperiod of the eastern unit of WCA 3B. Spoil mounds along the northwestern side of the L-67A Canal, in the proximity to the three new L-67A structures would also be removed to facilitate sheetflow connectivity with the WCA 3A marsh.

Increased outlet capability at the S-333 structure at the terminus of the L-67A Canal, removal of approximately 5.5 miles of the L-67 Extension Levee, and removal of approximately 6 miles of Old Tamiami Trail between the ENP Tram Road and the L-67 Extension Levee would facilitate additional deliveries of water from WCA 3A directly to ENP. Detailed design and construction of these features would minimize project footprints due to the nature of these environmentally sensitive areas. **Figure 3-1** provides a summary of the features included in the No Action Alternative – 2014 CEPP Final/EIS Alt4R2.

### 3.1.7.4 Lower East Coast Protective Levee (Yellowline)

Lower East Coast Protective Levee includes features primarily for seepage management, which are required to mitigate for increased seepage resulting from the additional flows into WCA 3B and ENP.

A newly constructed pump station with a combined capacity of 1,000 cfs would replace the existing temporary S-356 pump station, and a 4.2-mile partial depth seepage barrier would be built along the L-31N Levee south of Tamiami Trail.

There is an existing 2-mile seepage cutoff wall in the same vicinity that was constructed by a permittee as mitigation to offset authorized impacts under a Clean Water Act (CWA) Section 404 permit. There is a possibility that the same permittee may construct an additional 5- miles of seepage wall south of the 2-mile seepage wall, if permitted. Since the capability and effectiveness of the existing seepage wall to mitigate seepage losses from ENP remains under investigation, this alternative conservatively includes an approximately 4.2 mile long, 35 ft. deep tapering seepage barrier in the event construction is necessary. There are remaining uncertainties about the effectiveness of the seepage cutoff wall in maintaining desired stages in marshes of ENP while maintaining flood protection and canal stages to the east without limiting water availability to water users and Biscayne Bay. Therefore, additional analysis of the CEPP seepage cutoff wall would be conducted as an early phase in PED. See **2014 CEPP Final PIR/EIS Section 6.10.1.2**, the Engineering Appendix (**2014 CEPP Final PIR/EIS Appendix A**), the analyses required by the

WRDA 2000 (**2014 CEPP Final PIR/EIS Annex B**), and the CEPP Adaptive Management Plan (**2014 CEPP Final PIR/EIS Annex D Part 1**) for more detail about the remaining uncertainties and suggested analysis to be completed to determine the need for and extent of a CEPP seepage cutoff barrier wall. **Figure 3-1** provides a summary of the features included in the No Action Alternative – 2014 CEPP Final/EIS Alt4R2.

### **3.1.8 Alternative 2 – CEPP PACR Recommended Plan (Alternative C240A)**

The CEPP PACR alternative plan formulation began with screening to identify feasible management measures (structural and non-structural features or activities that address one or more planning objectives). Retained management measures underwent a screening analysis to evaluate, optimize, refine, and group management measures into alternative plans. The screening process is detailed in the CEPP PACR, Appendix E, and in CEPP PACR, Section 3.2 of the main report (both in Annex A).

This alternative is described in the CEPP PACR, as modified by the May 2018 Addendum. Alternative 2 only proposes changes to CEPP New Water, north of the redline (**Figure 3-2**).

The Alternative 2 (C240A) project features consist of:

- 240,000 ac-ft storage reservoir, plus A-1 FEB
- 10,500-acre reservoir, approximately 23 ft. deep
- 6,500 acre STA (3,500 acres on existing CEPP A-2 FEB footprint, additional 3,000 acres on A-2 Expansion lands)
- Conveyance improvements to the Miami and NNR Canal (1,200 cfs)
- Multi-purpose project operations
- New conflict structure to route treated STA water under the STA 3/4 intake canal and discharge to the Miami Canal south of G-373 divide structure.

The C240A is presented in more detail in the **CEPP PACR, Section 6, Annex A**.

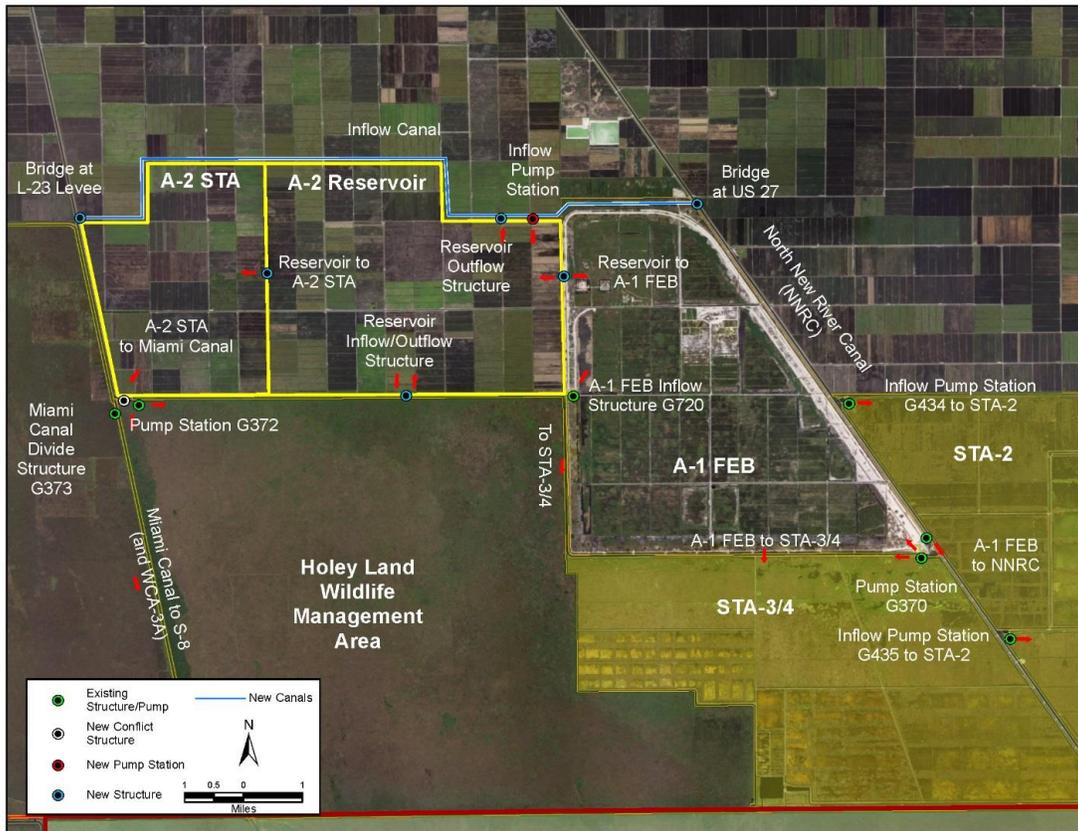


Figure 3-2. CEPP PACR Recommended Plan (Alternative C240A)

### 3.1.9 Alternative 3 - CEPP New Water Modification

Alternative 3 is identified as the Preferred Alternative for this Final EIS. The project known as Alternative 2 in this document (Alternative C240A) was authorized by Section 1308(a) of WRDA 2018 “with such modifications as the Secretary considers appropriate.” The Secretary’s May 2018 Review Assessment provides the results of the Washington-level review of the CEPP PACR. This review was conducted to determine whether the CEPP PACR and the process under which the study was developed, each comply with Federal laws and regulations; to provide a determination of whether the project is feasible; and to identify any conditions that the Secretary may require for construction of the project. Significant issues identified during the review pertained to substantive issues related to justification of the proposed modifications for the increased cost and benefits, dam safety design criteria, environmental requirements for NEPA and climate preparedness, as well as the recommendations to the implementation plan for the entire CEPP. Pursuant to Section 1308(b) of WRDA 2018, the project “may be constructed only after the Secretary prepares a report that addresses the concerns, recommendations, and conditions” identified in the Secretary’s May 2018 Review Assessment. Those concerns, recommendations, and conditions are addressed in this Final EIS to the extent they affected the development and assessment of project alternatives. The following analysis summarizes the results of the additional analysis and related changes to the project, if any. There were no substantial changes in the proposed action considered in the draft EIS that are relevant to environmental concerns, and thus a revised or supplemental draft EIS is not required.

- 3(a.) Updated Plan, NEPA, and Environmental Effects – the design of the EAA and STA have been modified due to seepage concerns. Approximately 12.5 miles of a “secondary” seepage canal that will offset by approximately 185 feet and be parallel to the Inflow/Outflow Canal between the Miami and North New River Canal.

Cutoff wall material changed from soil-bentonite to soil-cement-bentonite. These changes were coordinated with the SFWMD and environmental leads to ensure the STA size would not be compromised to maintain DMSTA modeling assumptions and results for water quality performance. These minor changes to the reservoir design may increase project costs, but will not change benefits or change effects from the project on the human environment. There may be minor beneficial hydrologic in effects downstream of Holeyfield Wildlife Management Area, which are included in the final NEPA document.

- 3(b.) Consult with Federal and State Agencies, Tribes, stakeholders – Additional Federal and State Agencies and stakeholder consultation will occur with the 30-day review of the Final EIS. Additional informal consultation with EPA, DOI regarding water quality risk, uncertainty, modeling, and measures to mitigate risk and uncertainty was conducted. New WQ modeling information is included in the NEPA document, but didn’t change the WQ performance outcome nor those agencies’ positions regarding the project performance. Additional government-to-government consultation with the Miccosukee Tribe of Indians of Florida occurred and is documented in the NEPA document. Coordination of specific WCA 3A water levels and tree islands and overall ecological health were discussed. In addition, the increased nutrient load to WCA 3A was discussed, and the project’s water quality risk reduction measures as well. The Corps agreed to form a technical team to review additional data from monitoring station that provide water quality assurances to the Tribe’s reservation land in WCA 3A. Additional monitoring will be used to inform project operations to avoid and minimize impacts to the reservation lands if they decrease from current conditions.
- 3(c.) Failure modes and life loss consequences analysis – The Jacksonville District (CESAJ) Risk Cadre completed a qualitative risk assessment (RA) for the EAA A-2 Reservoir on 10 May 2019, in general accordance with Best Practices in Dam and Levee Safety Risk Analysis (2016) and Safety of Dams - Policy and Procedures, ER 1110-2-1156. Through this effort 15 recommendations were made by the risk assessment team to reduce risk of the project with respect to As Low As Reasonably Practicable (ALARP) principles. These recommendations will be thoroughly evaluated and incorporated into the project design during PED.
- 3(d.) WQ Benefits Validation – The Corps in coordination with Department of Interior’s DMSTA-2 modeling contractor found an updated model validation for a period of record extending to 2018. The model performance did not change with respect to STAs in general and did not require modification of the STA size. The Corps updated information in the FEIS regarding conservative model assumptions used to minimize risk and uncertainty associated with reservoir and STA performance. Overall water quality risk and uncertainty with implementation to meet downstream state water quality criteria has not changed, nor has the approach to manage the remaining risk. Risk and uncertainty will be managed with regulatory permit compliance, monitoring that informs water quality performance metrics, and an adaptive management

process to adjust operations, project design, and/or requirement for additional water quality treatment actions.

- 3(e.) Water quality compliance – Further clarification has been made that this project will not be cost-shared until restoration strategies is complete and meeting state standards. In addition, an NPDES permit will be obtained for the new STA to ensure compliance with state water quality standards.
- 3(f.) CERP Programmatic Regulations System Evaluation - RECOVER has completed a system-wide evaluation of the CEPP PACR effects based on existing modeling done in the section 203 report. Across all reviewed regions (Northern Estuaries, Lake Okeechobee, Greater Everglades, Southern Coastal Systems), the selected plan (C240A) of the CEPP PACR provides comparable performance or demonstrable benefits compared to future without conditions (EARFWO) and is expected to benefit restoration objectives as outlined in the CERP. It is the opinion of the RECOVER evaluation team that whether the CEPP PACR is critical to restoration is dependent upon the region and metric: the greatest benefits are to the Northern Estuaries, specifically with regard to high flow events in the Caloosahatchee, and the reduction of Lake Okeechobee Regulatory Discharges in the St. Lucie. As an operational shift, total additional water south into the Greater Everglades and Southern Coastal Systems is not substantial in the selected plan compared to the previously authorized CEPP. Whereas the CEPP PACR will begin to reestablish hydrologic connectivity for WCA 3 and ENP, it does not substantially change hydrology in WCA 3 and ENP as deliveries in these areas continue to be subject to existing constraints in the system that have to be resolved before the full benefit of the reservoir can be felt in the southern portions of the system.
- 3(g.) Climate Change Analysis – In order to determine the risk and resiliency of the project to climate change, the CEPP PACR was evaluated in accordance with USACE climate guidance. The proposed increase in annual average volume of water will boost resiliency within the ENP and Florida Bay from potential environmental effects related to saltwater intrusion caused by Sea Level Change. The CEPP project provides substantially higher habitat functionality when compared to the future without in part due to the increased freshwater flows that reduce the loss of freshwater habitat within Everglades National Park. No statistically significant climate change trends were identified that would alter the overall hydrologic evaluations used in support of the EIS.

While the overall project design and footprint is the same between Alternative 2 and Alternative 3, the CEPP New Water Modification (Alternative 3) was designed to optimize the performance of the CEPP PACR Recommended Plan (Alternative 2). Alternative 2 proposed to mitigate for off-site seepage impacts to the north through the construction of a 30 foot (in depth) seepage cutoff wall and by active operation of the inflow/outflow canal water surface stages. Updated Engineering analysis performed since the Draft EIS have revealed that the operational range necessary for the inflow/outflow canal to minimize or eliminate off-site seepage impacts are too low to effectively operate the project features in addition to mitigating off-site impacts. Additionally, the depth of the seepage cutoff wall was also analyzed to determine if there was an adequate depth that could effectively mitigate off-site seepage impacts in conjunction with actively operating the inflow/outflow canal water surface. This analysis revealed that sub-surface conditions within the project footprint are such that the depth of cutoff wall beyond 30 feet does not

provide appreciable benefits to mitigating off-site impacts. A third management measure to address off-site impacts was the inclusion of a "secondary" seepage canal that would off-set and parallel the project Inflow/Outflow Canal that would have an operational water surface stage range similar to that of the northern agriculture fields. This management measure coupled with a 30- foot deep seepage cutoff wall, will allow the inflow/outflow canal to be operated independently to achieve its project purpose in providing water to the A-2 Reservoir while also mitigating off-site seepage impacts. Additional detail regarding these management measures and project features are discussed in updated sections A-7, A-8, and A-9 of the EN appendix that can be found in **Annex C** of this Final EIS.

The project's minor design refinements, which occurred between publication of the draft EIS in May 2018 and this Final EIS, were not substantial changes that are relevant to environmental concerns and bearing on the proposed action or its impacts. Therefore, a supplemental Draft EIS is not warranted. The project features remain the same as described in Alternative 2 (depicted in **Figure 3-2**):

- 240,000 ac-ft storage reservoir, plus A-1 FEB
- Reservoir designed to provide 10,500 ac-ft of storage,, approximately 23 ft. deep
- STA with treatment area of 6,500 acres (3,500 acres on existing CEPP A-2 FEB footprint, additional 3,000 acres on A-2 Expansion lands)
- Conveyance improvements to the Miami and NNR Canal (1,200 cfs)
- Multi-purpose project operations
- New conflict structure to route treated STA water under the STA 3/4 intake canal and discharge to the Miami Canal south of G-373 divide structure.

The acreages provided above for the reservoir and STA components of the project are based on the capacity and the effective treatment area. The physical footprints of the features will be slightly larger to accommodate infrastructure associated with the reservoir and STA, like intake canals and pump station footprints. The slightly larger areas of 11,300 acres for the reservoir and 6,600 acres for the STA were used in the analysis for Endangered Species Act consultation in the Biological Assessment provided by the Corps and forthcoming Biological Opinion from the U.S. Fish and Wildlife Service.

In addition, this Alternative includes features that address the ASA(CW) concerns, recommendations, and conditions. The changes to the CEPP PACR Recommended Plan included the addition of a secondary seepage canal and additional minor design modifications to reduce seepage, manage offsite impacts, and ensure water quality benefits. A Potential Failure Mode Analysis (PFMA) made recommendations (Appendix K of Corps' Engineering Regulation 1110-2-1156) to be incorporated during Pre-Construction, Engineering, and Design (PED).

Water quality benefits were maintained by not decreasing the STA size associated with design refinements and not increasing reservoir storage volume to be treated. Therefore, Recommended Plan (Alternative C240A) optimization features included in the revised cost estimate:

- Approximately 12.5 miles of a "secondary" seepage canal that will offset by approximately 185 feet and be parallel to the Inflow/Outflow Canal between the Miami and North New River Canal.

- Cutoff wall material changed from soil-bentonite to soil-cement bentonite-

USACE put together an implementation schedule for Alternative 3. This schedule requires the A-2 STA be constructed and operational prior to completion of the A2 Reservoir.

The interim operations for the A2 STA will be based on the Corps' 2008 Lake Okeechobee Regulation Schedule (LORS) and EAA Water Control Plan (or water control plan in place at the time that interim operations occur), which prescribes operational ranges for the C&SF EAA Canal System. During this interim period, consistent with the operational protocols used for the other existing State STAs and associated infrastructure, the A2 STA will be operated in accordance with the SFWMD Operations Plan that will be included as a condition of the regulatory permit, if issued. Consistent with the description of interim operations in the March 2018 CEPP PACR Annex C section C.21, interim operations during construction will include "implementation of an initial growing period with minimal water depths before construction is complete, to help establish vegetation." This interim operating period will begin as soon as levees facing the A-2 reservoir side are complete. During this interim operating period, water will be directed from the Miami Canal into the STA, through the cells, then discharged back into the Miami Canal. The purpose of the interim operating period is to establish and maintain vegetation so the STA is operable when the reservoir is complete. The SFWMD stated in their application that "the STA will be used to treat a portion of the Everglades Agricultural Area runoff and Lake Okeechobee discharge from the Miami Canal prior to returning it to the Miami Canal." However, based on review of the proposed Project Operating Manual the main purpose of that interim operating period is to establish and maintain vegetation to ensure the STA is ready and effectively removing nutrients when the reservoir comes online. Therefore, the USACE did not incorporate that stated need into the overall project purpose. The Corps acknowledges that ancillary water quality benefits may occur during the interim operating period but it is not the primary purpose. The interim operating period is a part of the construction process of an STA; therefore, the Corps did not evaluate operational alternatives for the interim operating period.

The interim operations of the A2 STA will not either assist nor hinder the State Restoration Strategies features in meeting state water quality standards since there will be no mixing of A2 STA discharges with other STA discharges. Mixing may occur downstream of Restoration Strategies compliance monitoring stations. Water quality monitoring will be in place to ensure optimal operation of the STA and to meet National Pollutant Discharge Elimination System (NPDES) permit requirements. The 17,900 acres removed from agricultural operations for construction of the A2 STA and A2 Reservoir has a supplemental irrigation requirement that will sustain vegetation in the A2 STA during the grow-in period while interim operations are in place. The CEPP PACR referenced the need for interim operations in **CEPP PACR, Annex C, Annex A.**

### **3.2 Environmentally preferred plan**

The environmentally preferred alternative is Alternative 3 CEPP New Water Modifications, and covers features described in the report required by Congress in Section 1308(b) of WRDA 2018. The goal in formulating the alternatives is to provide environmental benefits to the Northern Estuaries, Lake Okeechobee, and the Everglades system, as is the goal of CERP. Therefore, all alternatives are an improvement over the No Action Alternative because they provide more freshwater storage, treatment, distribution, and timing to improve conditions within the Everglades. The environmental benefits of

Alternative 3 are similar to Alternative 2, CEPP PACR Recommended Plan and are described in the following section. The difference between the two is that Alternative 3 contains design modifications to ensure seepage and offsite impacts are reduced. This analysis is further described in the Addendum to CEPP PACR Recommended Plan Appendix A, subsection A.9 - **Annex C**. In addition, Alternative 3 includes measures to reduce risk that the project will not achieving water quality benefits and are explained in **subsection 4.9** of this Final EIS.

### 3.3 Comparison and Modeling of No Action (Alternative 1), The CEPP PACR Recommended Plan (Alternative 2), and the CEPP New Water Modification (Alternative 3)

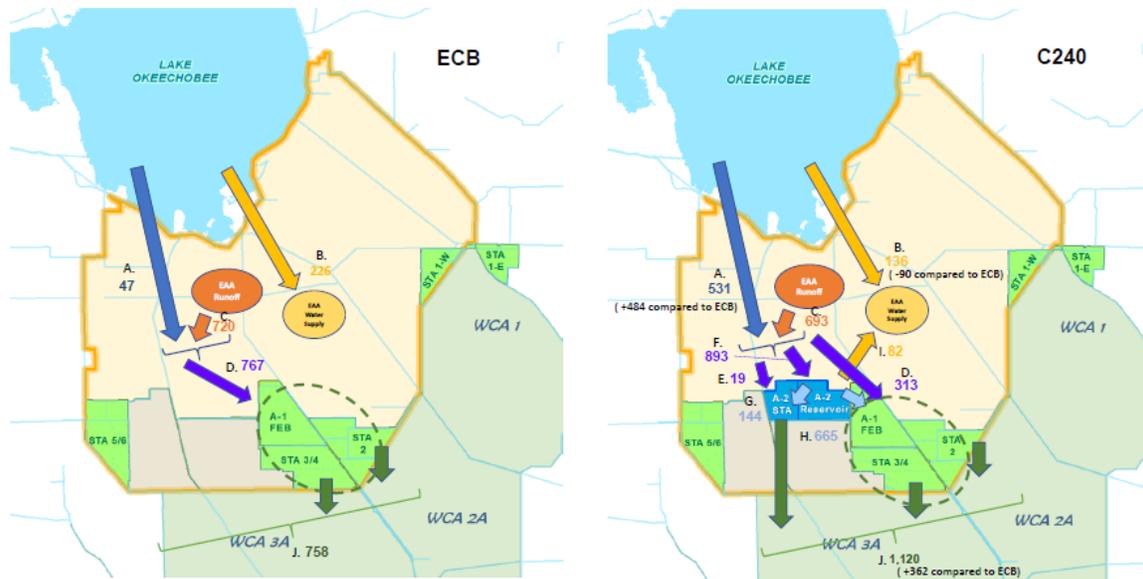
The CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would provide the next increment of improvement upon restoration of ecosystem function in the Caloosahatchee and St. Lucie Estuaries by further reducing the number, severity and frequency of regulatory releases of freshwater from Lake Okeechobee to the Northern Estuaries. A summary of changes to the Lake Okeechobee and EAA water budget between the No Action Alternative and the CEPP New Water Modification is provided in **Figure 3-3**, including the changes to the Lake Okeechobee regulatory flows to the south, additional inflows of treated water from the existing STAs to the Everglades Protection Area, and the quantity of treated water estimated from the new A-2 STA. When available, the reservoir may also provide water to maintain canal levels within the C&SF EAA Canal system, reducing the need for direct water supply deliveries to the canals from Lake Okeechobee and keeping water in the lake for future water supply deliveries. As depicted in the top of **Figure 3-4**, the CEPP PACR Recommended Plan would reduce the number of Lake Okeechobee water management releases to the Caloosahatchee Estuary (number of months flow was greater than 2,800 cfs from the C-43 Basin and Lake Okeechobee releases) by nine additional events over the FWO (**Table 3-3**). Alternative 2 and 3 would both reduce the number of Lake Okeechobee water management releases to the St. Lucie Estuary (number of months flow was greater than 2,000 cfs from Lake Okeechobee releases) by seven additional events over the FWO (**Table 3-3**). At the bottom of the **Figure 3-4**, the number of Lake Okeechobee water management release events lasting longer than four consecutive months is reduced from six events in the FWO to three events in Alternative 2 and 3. **Figure 3-5** shows the reduction in Lake Okeechobee water management releases to the St. Lucie (number of times 14-day moving average flow is greater than 2,000 cfs from Lake Okeechobee releases) by 14 events over the FWO. At the bottom of the **Figure 3-5**, the number of Lake Okeechobee water management release events lasting longer than four consecutive months is reduced from nine events in the FWO to four events in Alternatives 2 and 3.

**Table 3-3. Incremental change in reducing high-volume freshwater release to the Northern Estuaries as a result of Alternative 2 or Alternative 3**

High Volume Freshwater Releases from Lake Okeechobee	FWO (CEPP) Number of Months	CEPP PACR Recommended Plan (Alternative 2) Number of Months	CEPP New Water Modification (Alternative 3) Number of Months	Difference in Number of Months	Percent Difference from FWO
St. Lucie Estuary (Mean Monthly Flows above 2000 cfs)	56	49	Same as Alternative 2	7	13%

High Volume Freshwater Releases from Lake Okeechobee	FWO (CEPP) Number of Months	CEPP PACR Recommended Plan (Alternative 2) Number of Months	CEPP New Water Modification (Alternative 3) Number of Months	Difference in Number of Months	Percent Difference from FWO
St. Lucie Estuary (Mean Monthly Flows above 3000 cfs1)	24	21	Same as Alternative 2	3	13%
Caloosahatchee Estuary (Mean Monthly Flows above 2800 cfs)	70	61	Same as Alternative 2	9	13%
Caloosahatchee Estuary (Mean Monthly Flows above 4500 cfs1)	29	24	Same as Alternative 2	5	17%

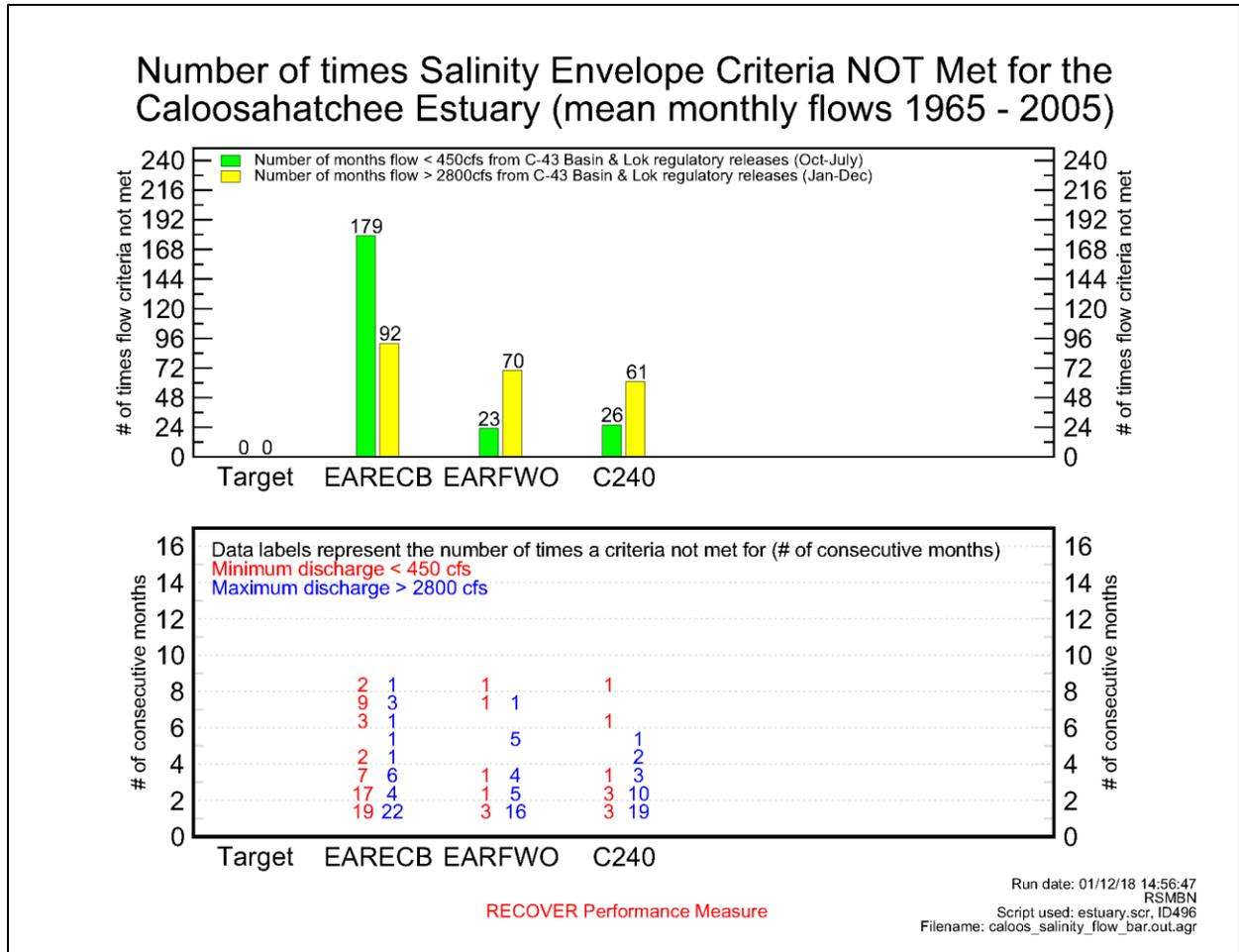
<sup>1</sup> Note: The higher flow number is cumulative and includes all high-volume flow events.



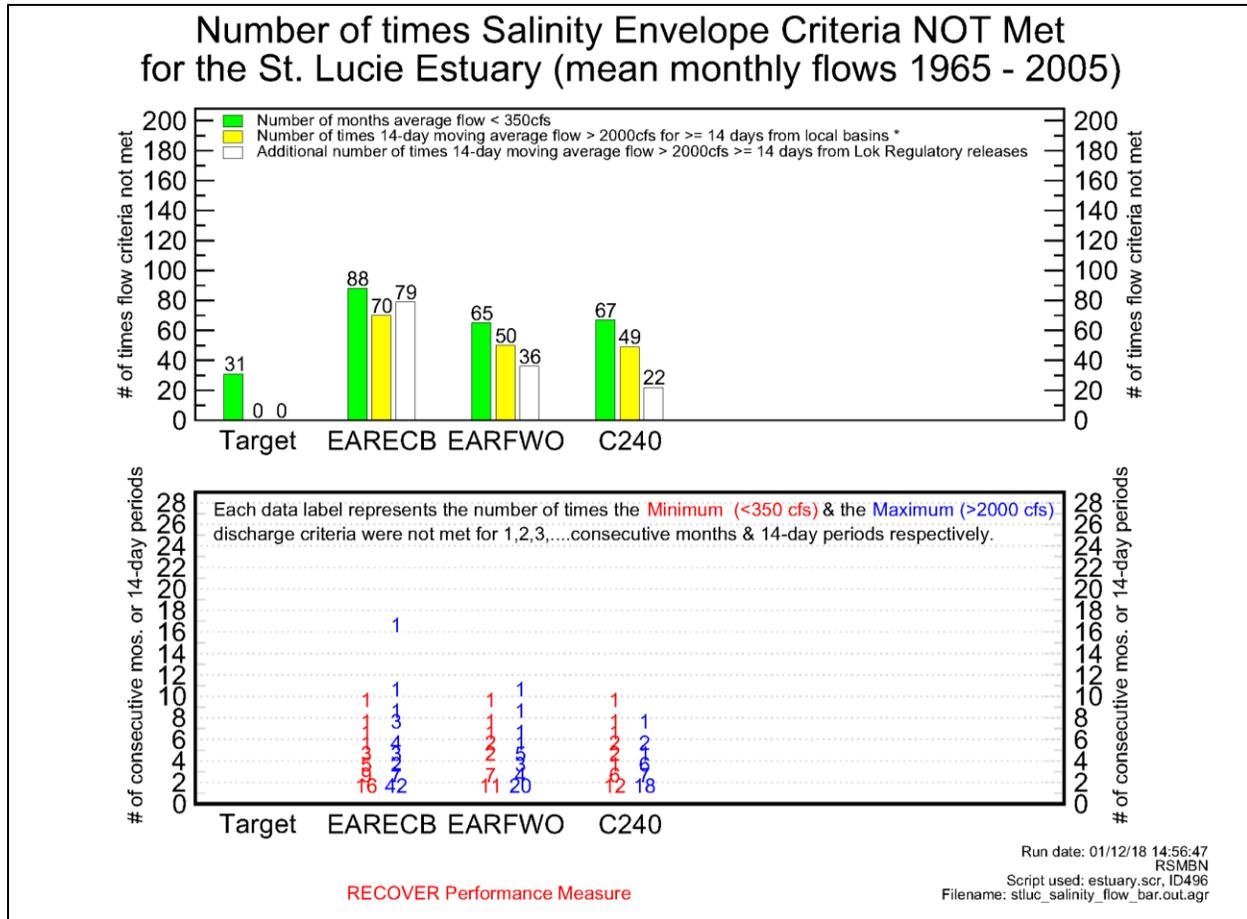
Water Budget labels on the maps correspond to the following features:  
 A. Lake O. releases (S-351 & S-354) to State/Federal Central Flowpath Storage and Treatment Facilities (ECB only has State facilities)  
 B. Lake O. releases for EAA Water Supply (S-351 & S-354)  
 C. EAA direct basin runoff  
 D. Inflows directly to State Central Flowpath Storage and Treatment Facilities  
 E. Inflows directly to PACR A-2 STA  
 F. Inflows to PACR A-2 Reservoir  
 G. Releases from PACR A-2 Reservoir to PACR A-2 STA  
 H. Releases from PACR A-2 Reservoir to State Central Flowpath Storage and Treatment Facilities  
 I. Releases from PACR A-2 Reservoir to EAA Water Supply  
 J. Combined STA-2, STA-3/4, and PACR A-2 STA releases to WCA-2A and WCA-3A (CEPP Red Line)

Notes and Caveats:  
 (1) Water budget values for the EAA Control Volume are from the CEPP PACR RSM-Basins model, with internal flows further processed to replicate key DMSTA routing characteristics.  
 (2) This diagram does not represent a complete water budget (e.g. differences due to seepage, ET, etc... are not displayed).  
 (3) For flow routing displayed in this diagram, the State's Storage and Treatment Facilities (A-1 FEB, STA3/4 and STA2) are combined; significant flexibility exists to manage operations between these features in order to maintain compliance with the WGBEL.

Figure 3-3: Everglades Agricultural Area Reservoir flow routing diagram, long-term annual average for May to April water year (WY 1966 to WY 2005; all values in thousands of acre-feet)



**Figure 3-4. Number of times salinity criteria not met for the Caloosahatchee Estuary under the ECB, FWO, and each alternative**



**Figure 3-5. Number of times salinity criteria not met for the St. Lucie Estuary under the ECB, FWO, and each alternative**

The CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) would both provide an overall 55% reduction in Lake Okeechobee water management release volumes and a 63% reduction in the number of discharge events to the Northern Estuaries from Lake Okeechobee, in conjunction with other authorized projects. High-flow releases lasting more than 60 days in the Caloosahatchee River Estuary or more than 42 days in the St. Lucie Estuary have been found to be particularly damaging to the oyster populations. Compared with the FWO, the additional storage and treatment proposed in the CEPP New Water Modification would reduce the number of these Lake Okeechobee water management releases by an additional 40% in the Caloosahatchee Estuary and 55% in the St. Lucie Estuary. The reduction in releases improves the salinity conditions in the estuaries by reducing the number of events that exceed the preferred salinity envelope by 39% in the St. Lucie Estuary and by 45% in the Caloosahatchee Estuary.

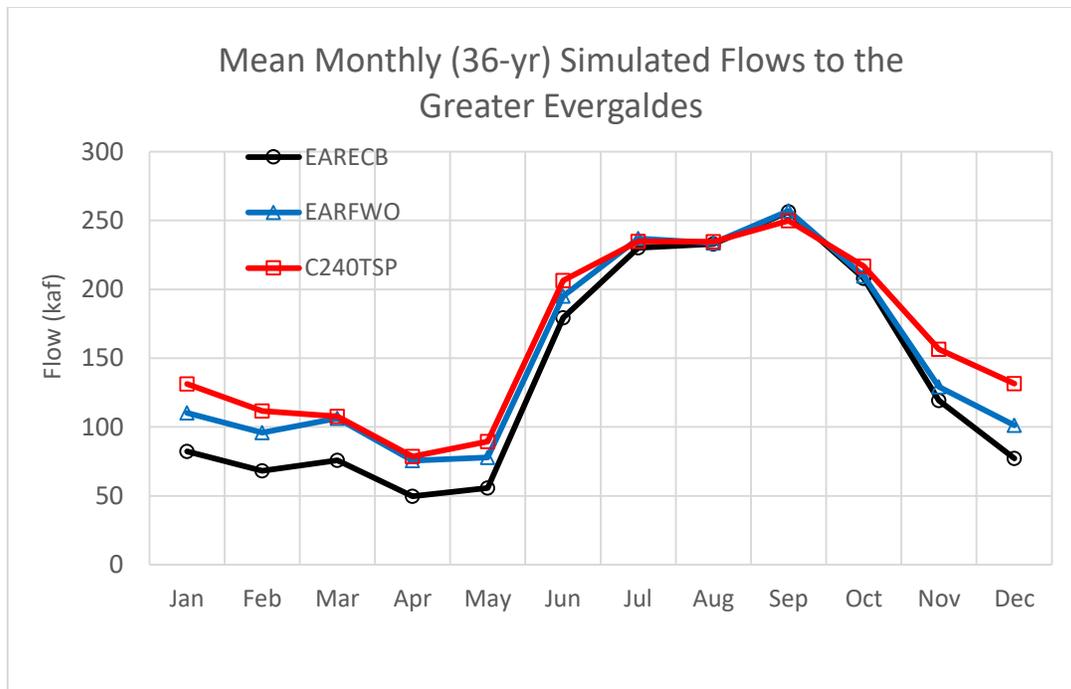
Currently, many oyster and seagrass beds are stressed and have been reduced or eliminated from their former areas by extreme salinity fluctuations. A reduction in the number of high-volume freshwater releases to the estuaries would help to reduce this associated stressor that is extremely detrimental to estuarine communities. Reductions in turbidity, color, and sedimentation would also allow greater light penetration, promoting the growth of seagrass beds and would help lessen the problem of the killing of

adult oysters and the flushing of oyster spat into outer areas of the estuaries that currently experience high salinity levels during the dry season resulting in increased predation and disease in the oyster population. Implementation of the CEPP New Water Modification provides an additional increment of the benefits envisioned in both CERP and the 2014 CEPP Final PIR/EIS, and builds upon those achieved in the Northern Estuaries with implementation of other CERP projects (i.e., CEPP, C-43 West Basin Storage Reservoir, and IRLS Project).

The benefits provided to the Northern Estuaries per the performance graphics below help further describe reduction in freshwater management releases from Lake Okeechobee. Improvements to estuarine resiliency is elucidated through the reduction of the number of events over time that exceed the flow rate which cause negative effects to oyster recruitment and survivorship.

The CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) would both provide an increase in the quantity of freshwater flowing into the historic Everglades flow path to approximately 370,000 ac-ft per year on an average annual basis. In the historic system, the inundation pattern supported an expansive system of freshwater marshes including long hydroperiod sawgrass “ridges” interspersed with open-water “sloughs”, higher elevation marl prairies on either side of Shark River Slough (SRS), and forested wetlands in the Big Cypress Marsh. Other authorized features of the 2014 CEPP PACR Final PIR/EIS would reduce compartmentalization and fragmentation of the Everglades landscape, thus facilitating the resumption of sheetflow and related patterns of hydroperiods and water depth that would benefit from deliveries of additional water from the reservoir proposed in Alternative 2 or 3 and significantly help restore and sustain the microtopography, directionality, and spatial extent of ridges and sloughs, and improve the health of tree islands within the landscape. Additional water flowing into the Everglades would also result in beneficial shifts in habitat for desired wildlife species. Implementation of either Alternative 2 or 3 features and additional flow would provide greater project benefits, especially to those areas located in northern WCA 3A. As modeled by the Regional Simulation Model for the Glades and Lower East Coast Service Area (RSM-GL) and Lower East Coast Service Area (LECSA) (version 2.3.2) for the period of simulation (1965–2005), differences in hydroperiods and stage between Alternative 2 and 3 and the FWO project condition show that both alternatives would provide longer hydroperiods and greater overland flow volumes, especially in NW WCA-3A. There has been a large amount of soil lost in this region. Increased hydroperiods would slow the rate of soil oxidation and decrease the extent of damaging peat fires. Alternative 2 and 3 would provide an added benefit to wading birds, such as wood storks and white ibis, in the region south of the EAA due to expanding foraging times and prey densities.

The 2014 CEPP Final PIR/EIS is expected to rehydrate northern WCA 3A by providing additional water and a means for redistributing that water in a manner that promotes sheetflow, and by removing the drainage effects associated with the Miami Canal. This would promote the reversal of soil loss and would help in the restoration of organic soil accretion. Alternative 2 and 3 would add to these benefits by providing additional new water to further facilitate restoration in the northern WCA 3A. Additional water from the both alternatives would likely result in benefits within the central WCA 3A due to slight increases in overland flow volumes. The southern WCA 3A would remain largely unaffected by Alternative 2 and 3 as compared to the FWO (**Figure 3-6**).



**Figure 3-6. Timing of Treated Flows South into the Greater Everglades**

The 2014 CEPP Final PIR/EIS would provide additional new water and begin to re-establish hydrologic connectivity of WCA 3A, WCA 3B, and ENP. Increases in stages and hydroperiods would promote wetland vegetation transition, through contraction of sawgrass marshes and expansion of wet prairies and sloughs. Additional water provided by the both Alternative 2 or 3 would facilitate the expected improvement.

The 2014 CEPP Final PIR/EIS is expected to rehydrate much of the Northeast Shark River Slough (NESRS ) by providing a means for redistributing flows from WCA 3A through WCA 3B to ENP. Restoration of flow volumes would significantly improve hydroperiods and water depths while reducing the frequency and severity of dry downs. Additional flow volume provided by Alternative 2 or 3 would provide additional improvement to hydrological conditions in this area.

The additional water provided by either Alternative 2 or 3 would improve conditions over those produced by the currently 2014 CEPP Final PIR/EIS. Similar to the 2014 CEPP Final PIR/EIS, the CEPP New Water Modification does not reconnect SRS to Taylor Slough or Florida Bay as it was historically, but it would allow additional surface water to flow southeastward around Mahogany Hammock towards West Lake, the Lungs, and Garfield Bight helping to negate the harmful buildup of hypersalinity. This is expected to help restore the bay to more natural conditions and increase biomass and diversity of bay flora and fauna including ecologically and economically important pink shrimp and spotted sea trout, and desired seagrass species.

### 3.4 Recommended Plan

Alternative 3, the Preferred Alternative, is the Recommended Plan for this Final EIS. The CEPP PACR Recommended Plan (**Alternative C240A**) was authorized by Section 1308 of WRDA 2018 with such

modifications as the Secretary of the Army considers appropriate. The project “may be constructed only after the Secretary prepares a report that addresses the concerns, recommendations, and conditions” identified in the Secretary’s May 2018 Review Assessment.

The Recommended Plan has been optimized as described in Section 3.1.5 of this Final EIS to address the Secretary’s concerns, recommendations, and conditions as stated in the Review Assessment particularly as they relate to maintaining reduced seepage and water quality benefits. The changes to the CEPP PACR Recommended Plan included minor design modifications to reduce seepage, manage offsite impacts, and ensure water quality benefits. A Potential Failure Mode Analysis (PFMA) made recommendations to be incorporated during Pre-Construction, Engineering and Design (PED). The features included in Alternative 3 are the same as shown in **Figure 3-2**.

### **3.4.1 Recreational Features of the Preferred Alternative**

The proposed recreation facilities in the No Action Alternative will increase public access at project features in the EAA and into the Greater Everglades. Facilities include sufficient gravel parking with boat ramps and trailheads, dry vault toilets, shelters, primitive camping sites and Americans with Disabilities Act compliant fishing platforms, and are described in detail in the 2014 CEPP Final PIR/EIS Appendix F, Recreation. Alternative 3 includes proposed modifications to CEPP, as authorized in 2016, that would involve minor changes to planned recreation facilities in the area of the A-2 Reservoir and A-2 STA (in lieu of the currently authorized A-2 FEB). These revisions are defined in the **CEPP PACR, Appendix F (Annex A)**.

The proposed features of the Recommended Plan recreation plan would not require additional real estate to be purchased. All features would be compatible with the environmental purposes of the project, and would not detract from the environmental benefits and would increase the socioeconomic benefits being generated by the project. The activities that would be permitted in the project area (bicycle riding, horseback riding, nature study, wildlife viewing, walking/hiking, boating, canoeing/kayaking, sailing, fishing, and hunting) are all well suited to the environmental purposes of the project. A major feature of the Recommended Plan would be approximately 28 miles of levee top trails that will loop around the A-2 Reservoir and A-2 STA. Boat ramps and parking used by the public would also be used for operations and maintenance purposes. Other recreational amenities include access gates, picnic tables and restroom facilities. See **Figure 3-7** for the public access routes and sites associated with the Recommended Plan.



Figure 3-7. Recommended Plan Public Access Sites and Routes

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#### **4 ENVIRONMENTAL EFFECTS OF THE NO ACTION PLAN (ALTERNATIVE 1), THE CEPP PACR RECOMMENDED PLAN (ALTERNATIVE 2), AND THE CEPP NEW WATER MODIFICATION (ALTERNATIVE 3)**

This Final EIS compares the potential environmental effects on the human environment of the No Action Alternative (Alternative 4R2 in the 2014 CEPP Final PIR/EIS; also referred to as the Future Without [No Action] in the CEPP PACR), Alternative 2 – the CEPP PACR Recommended Plan, and Alternative 3 (Preferred Alternative) – CEPP New Water Modification. The environmental effects of the No Action Alternative are thoroughly described in the 2014 CEPP Final PIR/EIS, Section 5.2, and are hereby incorporated by reference. The 2014 CEPP Final PIR/EIS is located at:

<http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/>.

The CEPP PACR is heavily referenced throughout this NEPA document due to the extensive environmental evaluation and documentation the SFWMD completed on effects of all alternatives analyzed including the the CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) and in conjunction with Corps planning principles. The specific concerns, recommendations, and conditions identified in the ASA(CW)'s Review Assessment were addressed in developing the CEPP New Water Modification Alternative (Alternative 3 – Preferred Alternative) that is analyzed in detail throughout this Final EIS. Discussions of Alternative 2, the CEPP PACR Recommended Plan, are only separated out in each resource category if the effects would differ from Alternative 3, the CEPP New Water Modification.

This NEPA document and its supporting documentation analyze in detail the potential effects of the the CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) compared to the No Action Alternative. Additional details regarding the alternatives analysis previously conducted for Alternative 2 can be found in **CEPP PACR Section 4.1, CEPP PACR, Section 5.0**, and in the May 2018 Draft EIS and are further discussed in the **in Appendix C.2.2 of the CEPP PACR**.

The the CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) would increase ecological benefits over those derived from the No Action Alternative by decreasing the number of freshwater releases to the Northern Estuaries (**Table 4-1**) and providing additional freshwater flow to the Everglades. Compared to the No Action Alternative, the CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) provides an overall 55% reduction in freshwater release volumes and a 63% reduction in the number of freshwater release events to the Northern Estuaries from Lake Okeechobee, in conjunction with other authorized projects. High-flow freshwater releases lasting more than 60 days in the Caloosahatchee River Estuary or more than 42 days in the St. Lucie Estuary have been found to be particularly damaging to the oyster populations. Compared with the No Action Alternative, the additional storage and treatment proposed in Alternative 2 and 3 would reduce the number of these freshwater releases by an additional 40% in the Caloosahatchee Estuary and 55% in the St. Lucie Estuary. The reduction in freshwater releases improves the salinity conditions in the estuaries by reducing the number of events that exceed the preferred salinity envelope by 39% in the St. Lucie Estuary and by 45% in the Caloosahatchee Estuary.

**Table 4-1. Comparison of High Volume Freshwater Releases between No Action (Alternative 1), CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3)**

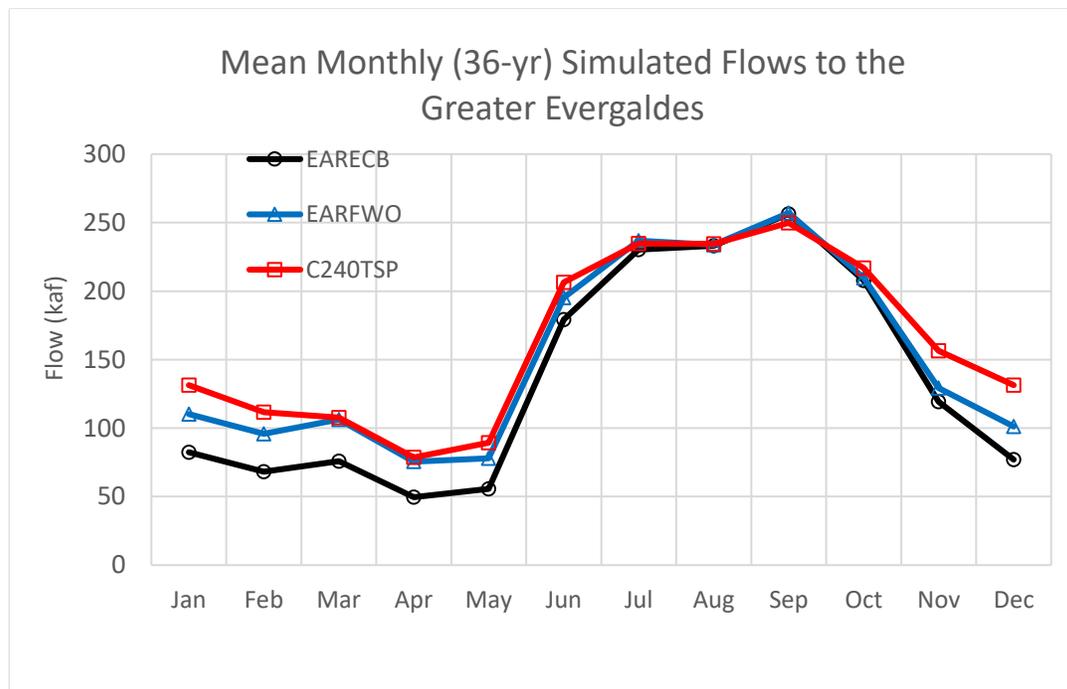
High Volume Freshwater Releases from Lake Okeechobee	No Action (2014 CEPP) (Alternative 1) Number of Months	CEPP PACR Recommended Plan (Alternative 2) Number of Months	CEPP New Water (Alternative 3) Number of Months	Difference in Number of Months	% Difference from No Action Alternative
St. Lucie Estuary (Mean Monthly Flows above 2000 cfs)	56	49	Same as Alternative 2	7	13%
St. Lucie Estuary (Mean Monthly Flows above 3000 cfs <sup>1</sup> )	24	21	Same as Alternative 2	3	13%
Caloosahatchee Estuary (Mean Monthly Flows above 2800 cfs)	70	61	Same as Alternative 2	9	13%
Caloosahatchee Estuary (Mean Monthly Flows above 4500 cfs <sup>1</sup> )	29	24	Same as Alternative 2	5	17%

The system-wide benefits would be realized due to the increase in the amount of water storage in the A-1 and A-2 parcels, and changes to Lake Okeechobee and water supply operations. The greatest benefits would be incurred by the operational efficiencies.

The CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) would provide an increase over the No Action Alternative in the quantity of freshwater flowing into the historic Everglades flow path to approximately 370,000 ac-ft per year on an average annual basis. In the historic system, the inundation pattern supported an expansive system of freshwater marshes including long hydroperiod sawgrass “ridges” interspersed with open-water “sloughs”, higher elevation marl prairies on either side of SRS, and forested wetlands in the Big Cypress Marsh. Other features of Alternative 4R2 in the 2014 CEPP Final PIR/EIS would reduce compartmentalization and fragmentation of the Everglades landscape, thus facilitating the resumption of sheetflow and related patterns of hydroperiods and water depth that would benefit from deliveries of additional water from the proposed reservoir in the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) and significantly help restore and sustain the microtopography, directionality, and spatial extent of ridges and sloughs, and improve the health of tree islands within the landscape. Additional water flowing into the Everglades would also result in beneficial shifts in habitat for desired wildlife species. Implementation of the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) and additional flow would provide greater project benefits, especially to those areas located in northern WCA 3A. As modeled by the RSM-GL and LECSA model (version 2.3.2) for the period of simulation (1965–2005), differences in hydroperiods and stage between Alternative 2 or 3 and the No Action (Alternative 1) project condition show that either Alternative 2 or 3 would provide longer hydroperiods and greater overland flow volumes, especially in NW WCA-3A as compared to the No

Action Alternative (**Figure 4-1**). There has been a large amount of soil lost in this region. Increased hydroperiods would slow the rate of soil oxidation and decrease the extent of damaging peat fires.

The No Action Alternative is expected to rehydrate northern WCA 3A by providing additional water and a means for redistributing that water in a manner that promotes sheetflow, and by removing the drainage effects associated with the Miami Canal. This would promote the reversal of soil loss and would help in the restoration of organic soil accretion. The CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would add to these benefits by providing additional new water to further facilitate restoration in the northern WCA 3A. Additional water from the CEPP New Water Modification would likely result in benefits within the central WCA 3A due to slight increases in overland flow volumes. The southern WCA 3A would remain largely unaffected by either Alternative 2 or 3 as compared to the No Action Alternative.



**Figure 4-1. Timing of Treated Flows South into the Greater Everglades (EARFWO = No Action (Alternative 1), C240TSP = CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3)**

The No Action Alternative would provide additional new water and begin to re-establish hydrologic connectivity of WCA 3A, WCA 3B, and ENP. Increases in stages and hydroperiods would promote wetland vegetation transition, through contraction of sawgrass marshes and expansion of wet prairies and sloughs. Additional water provided by either the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would facilitate the same expected improvements.

The No Action Alternative is expected to rehydrate much of the North East Shark River Slough (NESRS) by providing a means for redistributing flows from WCA 3A through WCA 3B to ENP. Restoration of flow volumes would significantly improve hydroperiods and water depths while reducing the frequency and

severity of dry downs. Additional flow volume provided by Alternative 2 or 3 would provide additional improvement to hydrological conditions in this area.

The additional water provided by the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would improve conditions over those produced by the No Action Alternative. Similar to the No Action (Alternative 1), Alternative 2 and 3 do not reconnect SRS to Taylor Slough or Florida Bay as it was historically, but they would allow additional surface water to flow southeastward around Mahogany Hammock towards West Lake, the Lungs, and Garfield Bight helping to negate the harmful buildup of hypersalinity. This is expected to help restore the bay to more natural conditions and increase biomass and diversity of bay flora and fauna including ecologically and economically important pink shrimp and spotted sea trout, and desired seagrass species.

The change from the No Action alternative (Alternative 4R2 in the 2014 CEPP Final PIR/EIS) to either the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) were conversion of the 14,000 acre A-2 FEB to a reservoir 10,500 acre storage reservoir and a STA with a treatment area of 6,500 acres of STA, which includes an additional 3,000 acres of STA on the A-2 expansion footprint that was not considered during the 2014 CEPP Final PIR/EIS development (**Figure 4-2**).

While the overall project design and footprint is the same between Alternative 2 and Alternative 3, the CEPP New Water Modification (Alternative 3) was designed to optimize the performance of the CEPP PACR Recommended Plan (Alternative 2). Alternative 2 proposed to mitigate for off-site seepage impacts to the north through the construction of a 30 foot (in depth) seepage cutoff wall and by active operation of the inflow/outflow canal water surface stages. Updated Engineering analysis performed since the Draft EIS have revealed that the operational range necessary for the inflow/outflow canal to minimize or eliminate off-site seepage impacts are too low to effectively operate the project features in addition to mitigating off-site impacts. Additionally, the depth of the seepage cutoff wall was also analyzed to determine if there was an adequate depth that could effectively mitigate off-site seepage impacts in conjunction with actively operating the inflow/outflow canal water surface. This analysis revealed that sub-surface conditions within the project footprint are such that the depth of cutoff wall beyond 30 feet does not provide appreciable benefits to mitigating off-site impacts. A third management measure to address off-site impacts was the inclusion of a "secondary" seepage canal that would off-set and parallel the project Inflow/Outflow Canal that would have an operational water surface stage range similar to that of the northern agriculture fields. This management measure coupled with a 30 foot deep seepage cutoff wall, will allow the inflow/outflow canal to be operated independently to achieve its project purpose in providing water to the A-2 Reservoir while also mitigating off-site seepage impacts. Additional detail regarding these management measures and project features are discussed in updated sections A-7, A-8, and A-9 of the EN appendix that can be found in Annex C of this Final EIS.

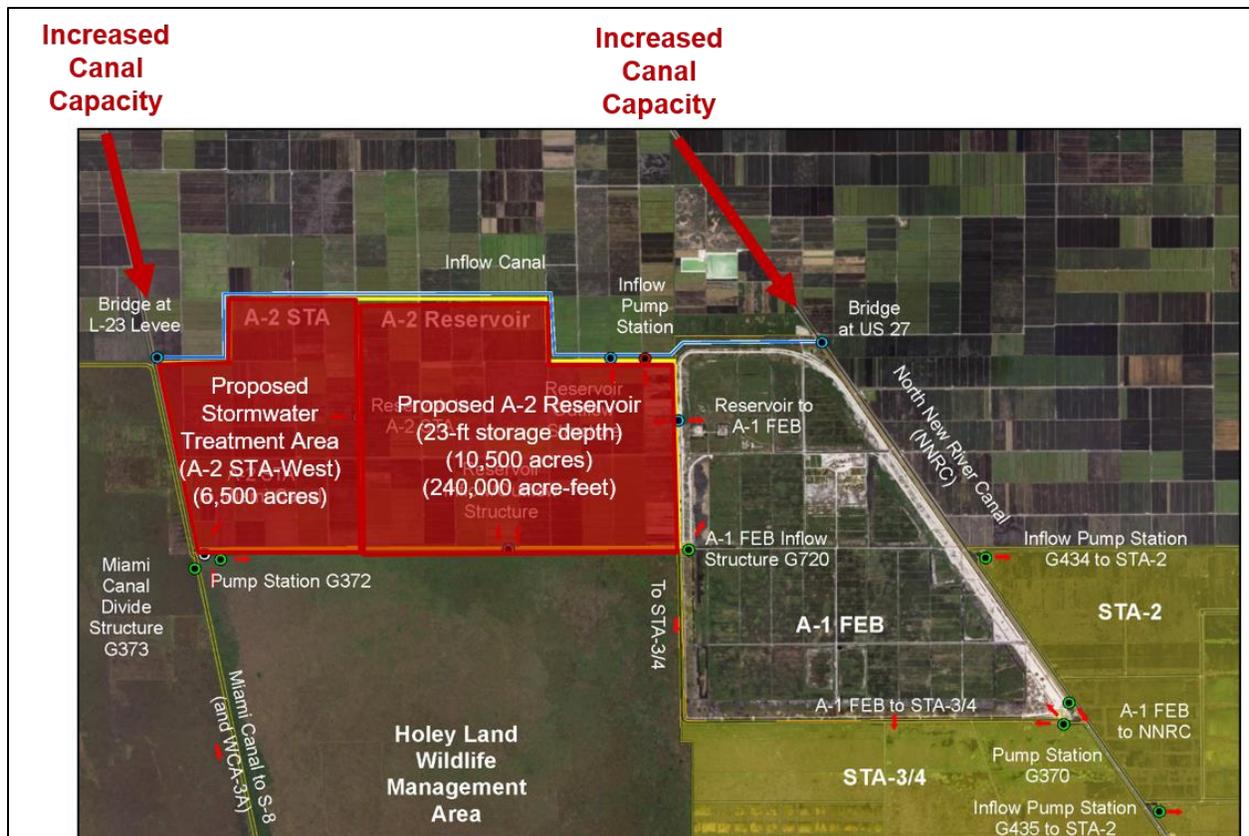


Figure 4-2. CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) Change from the No Action (Alternative 1) (Red color indicates proposed changes from No Action Alternative).

For this environmental effects analysis, intensity was rated using the following categories:

- Negligible-effect to the resource or discipline is barely perceptible and not measurable and confined to a small area
- Minor-effect to the resource or discipline is perceptible and measurable and is localized
- Moderate-effect is clearly detectable and could have appreciable effect on the resource or discipline; or the effect is perceptible and measurable throughout the project area
- Major-effect would have a substantial, highly noticeable influence on the resource or discipline on a regional scale

Duration: The duration of the effects in this analysis is defined as follows:

- Short term-when effects last less than one year
- Long term-effects that last longer than one year
- No duration – no effect

#### 4.1 Climate

Similar to the No Action Alternative, implementation of the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would have a short-term, negligible effect on climate within the action area. Minor, localized effects to microclimate may occur as a result of the redistribution of water and shifts in vegetation. Potential effects may include increases in evapotranspiration, increases in localized rainfall and temperature changes.

USACE established an overarching USACE Climate Change Adaptation Policy Statement to support climate preparedness and resilience in 2011. In 2014, the policy was updated and the Climate Preparedness and Resilience (CPR) Community of Practice (CoP) was established. CPR policy states that climate change assessments should be considered for all phases of the project life cycle, for both existing and proposed projects where decision documents are required. As a result, in order to determine the risk and resiliency of the project to climate change, the CEPP PACR was evaluated in accordance with USACE climate guidance, and the USACE technical report (included as Annex C.5 of this Final EIS) was provided to SFWMD in May 2018.

Water from the EAA Reservoir will ultimately make its way to the ENP and Florida Bay by an additional 160,000 acre-ft per year, on average. The increase in annual average volume of water will boost resiliency within the ENP and Florida Bay from potential environmental effects related to saltwater intrusion caused by SLC. The opposite will be true for the Northern Estuaries as freshwater discharges from Lake Okeechobee will decrease with the implementation of the EAA Reservoir and CEPP. The effects of sea level rise have been analyzed per (EC 1165-2-212). The May 2018 analysis looked at the effect of Sea-Level Change (SLC) on the benefits predicted for the SFWMD PACR Recommended Plan (Alternative 2), and the local changes within the EAA Reservoir construction footprint identified for the CEPP New Water Modification (Alternative 3) will not change the prior analysis and conclusions. The results indicate that within the 50-year planning horizon the average annual net project benefits are likely to be reduced by less than 8 percent in comparison to the projected net annual average project benefits estimated assuming no sea level rise. This relatively moderate decrease in average annual project benefits occurs largely because of closely matching habitat losses under the future without condition. As analyzed in the 2014 CEPP Final PIR/EIS, the total habitat function is significantly higher with the original 2014 CEPP PIR authorization in place under any SLC scenario and timeframe when compared to the future without condition. The ability of the CEPP project to provide substantially higher habitat functionality when compared to the future without is partly a result of the increased freshwater flows that reduce the loss of freshwater habitat within Everglades National Park, and the addition of the EAA Reservoir (Alternative 2 and Alternative 3) will only provide an additional volume of water to the Everglades National Park estuaries which is assumed to alleviate SLC scenarios.

The traditional use of the habitat unit calculations conducted in the 2014 CEPP Final PIR/EIS and the CEPP PACR make it difficult to capture the value and underestimates the true project benefits associated with the timing shift of water deliveries and the additional flow volume introduced into the central Everglades by the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3). One of the more significant benefits to ENP of the CEPP PACR not captured by Habitat Units is the increase hydraulic head in Shark River Slough (SRS) compared to sea level. Coastal wetlands are prone to

peat collapse and loss with rising sea levels. The increased volumes of water delivered to SRS during the dry season will maintain the same water depths as the 2014 CEPP Final PIR/EIS Recommended Plan but will do it for a longer period of time, which will make a critical difference in the intrusion of saltwater up into the freshwater marshes of ENP.

The hydrologic analysis included in Annex C.5 is an initial assessment on available historical data using a screening level tool. There do not appear to be any statistically significant trends that will impact the overall hydrology that is used in the EAA Reservoir. The science of climate change and hydrology is rapidly progressing and more work is likely needed in the future as data, numerical modeling tools and climate scenarios become more mature. In conclusion, the impacts of climate change on the CEPP New Water Modification appear to be negligible, however more study will be needed as climate change tools and techniques evolve.

## 4.2 Geology and Soils

The CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would result in conversion of the 14,000 acre 2014 CEPP Final PIR/EIS A-2 FEB to an 10,500 acre aboveground storage reservoir and 6,500 acre STA (an additional 3,000 acres were added to the project footprint). The additional water storage would allow for further reduction in sediment and silt as compared with the No Action Alternative that would have a minor beneficial effect on the Northern Estuaries. Similar to the No Action Alternative, in the southern portion of the EAA, conversion of agricultural lands to storage and treatment wetlands would have a moderate beneficial effect to soils within the project footprint by reducing dry condition-based soil subsidence. Moderately improved hydroperiods and sheetflow in the northern regions of WCA 3A would be expected to reduce soil oxidation, which would, in turn, promote peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. Minor hydroperiod improvements to the rest of the Greater Everglades would have a negligible effect on soil oxidation. Alternative 2 or 3 would have a minor increase in inundation duration as compared with the No Action Alternative that would decrease soil oxidation, subsidence, and peat fires, and increase carbon sequestration and promote the formation of peat soils. Alternative 2 and 3 showed minor improved hydrologic conditions in northern WCA 3A, especially in the northwest (see **CEPP PACR Appendix G, Table G-21 and Table G-22**) as compared with the No Action Alternative. All conveyance canals are excavated through limestone and therefore erosion would not be expected to occur in any areas as compared to the No Action Alternative.

## 4.3 Vegetation

The CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would reduce the frequency and duration of low and extremely low lake stages in Lake Okeechobee, and slightly increase the frequency and duration of extreme high lake stages, as compared to the No Action Alternative. Additionally, lake stages in the mid- to lower-portions of the beneficial envelope (12.5 to 15.5 ft. NGVD) would occur less frequently with the Alternative 2 or 3. Alternative 2 and 3 shows performance improvement within the Northern Estuaries as indicated by fewer high-volume flow months and less frequent freshwater releases events providing a moderate beneficial effect (see **CEPP PACR, Appendix G for actual**). As compared to the No Action Alternative, reduction in return frequencies, high flows, and accompanying flow velocities would result in lower suspended solids,

color, and colored dissolved organic matter, thereby allowing greater light penetration to promote growth of submerged aquatic vegetation (SAV).

As compared with the No Action Alternative, mangrove communities and seagrass beds associated with the Northern Estuaries would likely show a moderate and long-term benefit with Alternative 2 or 3 from reduction in high flows, and accompanying flow velocities would result in lower suspended solid loading and decreased concentration of colored dissolved organic matter, thereby allowing greater light penetration to promote growth of SAV. Refer to **CEPP PACR Appendix C.2.2** for a detailed comparison of potential effects to vegetation since impacts under the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) would be the same.

As result of the design refinements to optimize the performance of the CEPP PACR Recommended Plan (Alternative 2), the CEPP New Water Modification (Alternative 3) will result in an increase of 0.25 to 1.0 ft of seepage to Holeyland wildlife management area (WMA) to the south of the proposed reservoir and STA within northeast Holeyland (refer to the revised Appendix A.9) over the existing condition. Holeyland is overdrained and this additional water will provide beneficial effects as source water to meet the target hydroperiods in Holeyland WMA, where the target depths of interior marsh should be between 0.75 - 1.0 ft on average. The seepage water comes from groundwater effects of the A-2 Reservoir and would not include excess nutrients after filtering through 30-40 feet of ground substrata. Nutrients have been a concern for Holeyland WMA that experiences nuisance cattail. The adjacent A-2 Reservoir and STA could indirectly improve nutrient conditions in this area by rerouting flow into the project. This could provide additional vegetation benefit in Holeyland WMA to favor non-nuisance and native species. Additional information can be found in Annex C of this Final EIS.

Due to changes in the quantity, quality, distribution and timing of water entering the Greater Everglades ecosystem, long-term and minor effects on wetland hydrology and vegetation would potentially occur with implementation of the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3). Both alternatives distributes almost all of their additional water through the degraded L-4 levee as outlined in the 2014 CEPP Final PIR/EIS and across the northern Water Conservation Area (WCA 3A), thereby increasing sheetflow, hydroperiods, and depths within this area. Both Alternative 2 and 3 would increase the hydration of northern WCA 3A, especially northwest WCA 3A, promoting peat accretion, and reducing the potential for high intensity fires and promoting transition from upland to wetland vegetation. Alternative 2 and 3 provide moderate improvements to the low-depth (0.0-1.0-foot) hydroperiods in WCA 2A compared to the No Action Alternative, and would slightly increase the duration of the high-depth (1.0–2.5- feet) hydroperiods (**CEPP PACR Appendix C.2, Figure C.2.2-31**). Essentially, there is very little difference between the No Action (Alternative 1), the CEPP New Water Modification (Alternative 2), and the CEPP New Water Modification (Alternative 3) for WCA 2A. There is no difference between the CEPP New Water Modification and the No Action on the environmental impacts of the hydrology in WCA 2B (**CEPP PACR Appendix C.2, Figure C.2.2-32**).

The northwestern WCA 3A is the only region in the Greater Everglades where the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) would have a long- term, moderate beneficial effect to the vegetation, as compared to the No Action Alternative. The routing of flows through the northwest portion of WCA 3A in the No Action Alternative may result in the

expansion of cattail vegetation due to increasing nutrient loads. There is the potential for this loading to continue or increase with Alternative 2 or 3 and it is difficult to know exactly how the northwest region vegetation would respond to the increase flows associated with the either plan. In order to address this uncertainty, management options were developed that focus upon vegetation management within northwestern WCA 3A and are included within an Adaptive Management Plan applicable to Alternative 2 or 3 since they are essentially the same.(refer to **CEPP PACR Annex D**).

Similar to the No Action Alternative, implementation of the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) is expected to rehydrate NESRS by increasing the average annual overland flow to NESRS (Transect 18) by some 40,000 ac-ft compared to the No Action Alternative, providing long-term moderate environmental benefits. Resumption of sheetflow and related patterns of hydroperiod extension would significantly help to restore pre-drainage patterns of water depths and the complex mosaic of Everglades' vegetation communities. Reduction in the number and duration of dry events in NESRS is a major environmental benefit since extended hydroperiods would reduce soil oxidation, decrease fire potential, promote peat accretion, and aid in restoration of historic wetland vegetation communities. A count of the ability of Alternative 2 and 3 to decrease the duration of dry events, calculated for the driest of years (1972, 80, 81, 87, 89, 93), was 11 weeks and was no different from the average duration of dry events calculated for the No Action Alternative.

There is a long-term, moderate to minor increase in the overland flow rates with Alternative 2 and 3 in NESRS and Taylor Slough, respectively. Such flows can reduce coastal salinities and maintain hydrological and ecological connectivity. Overland flows also help to maintain the ridge-slough patterns in all of SRS. Average annual increase in sheetflow across Transect 27 in SRS is increased by 68,000 ac-ft. The average annual sheetflow across Transect 23B in Taylor Slough is increased by 3,000 ac-ft as compared to the No Action Alternative (**Appendix C.2.2 of CEPP PACR** for detailed vegetation and figures, Annex A since impacts would be the same under Alternative 3).

The Everglades, a phosphorus-limited system, historically received most inputs of phosphorus through rainfall, with average Total Phosphorus (TP) concentrations of less than 0.01 milligrams per liter (mg/L) (McCormick et al. 1996, Newman et al. 2004). Recent data show that all areas within ENP, including NESRS, have TP concentrations less than of 0.01 mg/L (SFER 2017 South Florida Environmental Report). Any additional inputs resulting from implementation of Alternative 2 or 3(refer to **CEPP PACR Section 5.2.9, Water Quality** for details) have the potential to result in vegetation changes within NESRS. Vegetation that can assimilate nutrients directly from the water column appears to be the most sensitive to nutrient enrichment and include periphyton and floating-leaved plants, such as spatterdock and water lily (Chaing et al. 2000, Newman et al. 2004). Potential effects on vegetation and species community composition within due to changes in water quality within NESRS and ENP cannot fully be determined at this time. Water quality within study area would continue to be monitored, as described in the **CEPP PACR** Water Quality and Adaptive Management sections in **Annex D**.

#### 4.4 Threatened and Endangered Species

Federal threatened, endangered, and candidate species that may occur within the action area (Palm Beach County) include Florida panther (*Puma concolor coryi*), Everglade snail kite (*Rostrhamus sociabilis*

*plumbeus*), Northern crested caracara (*Caracara cheriway*), wood stork (*Mycteria americana*), and Eastern indigo snake (*Drymarchon corais couperi*). Species effect determinations were based on the change in the CEPP project footprint of the A-2 shallow FEB in the No Action Alternative to an aboveground deep reservoir (10,500 acres) and an additional 3,000 acres of uplands to a STA (for total of 6,500 acres) in the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) (see **Figure 4-2**).

The Corps determined that Alternative 3 (preferred alternative) may affect, but is not likely to adversely affect, the Everglade snail kite, caracara, and wood stork; and it may affect Florida panther and Eastern indigo snake. Effects due to the change in hydrology due to either Alternative 2 or 3 are expected to remain the same as the determinations in the 2014 CEPP Final PIR/EIS Biological Assessment.

Threatened and endangered species that the Corps anticipated that the project may affect were compared to the No Action Alternative and are described in more detail in the Biological Assessment (BA) that was submitted to the USFWS on May 1, 2018 (Appendix A – USFWS Coordination). For a detailed analysis of the life history of each species and potential effects associated with the project area please refer to Appendix A of this Final EIS and the **CEPP PACR Appendix C.2.1**. A final BO is expected from USFWS prior to December 31, 2019, with concurrence on the USACE may affect, but is not likely to adversely affect determinations for the federally threatened Audubon’s crested caracara (*Polyborus plancus audubonii*, now *Caracara cheriway*; caracara), federally endangered Everglade snail kite (*Rostrhamus sociabilis plumbeus*; snail kite), and federally threatened wood stork (*Mycteria americana*). USFWS concluded the adverse effects on the federally threatened eastern indigo snake (*Drymarchon corais couperi*; indigo snake) and endangered Florida panther (*Felis concolor coryi*; panther) would not jeopardize the continued existence and provided take for the indigo snake and accounting of panther habitat unit conservation debits from the CERP panther habitat conservation site on Picayune Strand.

A Programmatic Section 7 ESA consultation for the Comprehensive Everglades Restoration Plan (CERP) was prepared on March 15, 2013 to evaluate potential effects of CERP on listed species and designated critical habitat under the NMFS’ purview. The Corps provided a Programmatic BA for the CERP to NMFS on July 2, 2013. NMFS provided a Programmatic BO for the CERP to the Corps on December 17, 2013 that included consultation for CEPP. The 2013 Programmatic BO concurred with the determination that CERP, including CEPP is not likely to adversely affect any listed species or their designated critical habitat under NMFS’ purview. Those species included Johnson’s seagrass *Halophila johnsonii*, smalltooth sawfish *Pristia pectinata*, green sea turtle *Chelonia mydas*, hawksbill sea turtle *Eretmochelys imbricata*, leatherback sea turtle *Dermochelys coriacea*, Kemp’s ridley sea turtle *Lepidochelys kempii*, and loggerhead sea turtle *Caretta caretta*. The 2013 Programmatic BO also concurred with the “No Effect” determinations made by the Corps in regard to the applicable threatened or endangered species that fell under the purview of NMFS as a result of 2014 CEPP Final PIR/EIS implementation. No effect determinations were made for the blue whale *Balaenoptera musculus*, finback whale *Balaenoptera physalus*, humpback whale *Megaptera novaeangliae*, sei whale *Balaenoptera borealis*, sperm whal *Physeter macrocephalus*, gulf sturgeon *Acipenser oxyrinchus desotoi*, shortnose sturgeon *Acipenser brevirostrum*, elkhorn coral *Acropora palmata*, and staghorn coral *Acropora cervicornis*. The CEPP EAA New Water Modifications modify the 2014 CEPP project effects to further reduce the frequency and volume of high-level freshwater flows from Lake Okeechobee to the Caloosahatchee River Estuary and the St. Lucie Estuary, thus reducing the potential

for adverse impacts on estuarine and nearshore biota and providing a minor beneficial effect. The change in footprint due to the EAA Reservoir and STA would have no effect on species under NMFS purview.

#### 4.5 State Listed Species

The project area contains habitat suitable for the presence, nesting, and/or foraging of 24 State-listed threatened, endangered, and species of special concern fauna and flora (refer to **CEPP PACR Appendix C.2.2.**).

While small foraging or nesting areas utilized by many of these animal species may be affected by this project, Alternative 2 or 3 should not have any negative effects on protected State species when compared to the No Action Alternative. Impacts to wading bird species as a group would be similar to those specified in the BA (see Appendix A of this Final EIS) affecting the wood stork. Subtle changes in water quality can also support the prey base so that net effects on forage availability can be variable. Overall, no long-term, adverse impacts are anticipated to State listed species as a result of implementation of either Alternative 2 or 3 as compared to the No Action Alternative.

#### 4.6 Wildlife

A comparison of the No Action Alternative and either the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) (since they are essentially the same) and their potential effects on wildlife within the project area, including invertebrates, fish, amphibians and reptiles, birds, and mammals are described in detail in the **CEPP PACR, Appendix C.2.2.5**. Short term, negligible to beneficial effects are expected to occur due to the slight change in hydrology throughout the WCAs and the construction of the A-2 storage reservoir and A-2 STA. The changes in hydrology associated with the conversion of the FEB to a storage reservoir as well as the increased volume of water flowing south could increase periphyton production within WCA 3 and ENP, as compared with the No Action Alternative. Periphyton is a major food source for many species throughout the Everglades, thereby implementation of Alternative 2 or 3 would provide a minor long-term effect.

Due to the rehydration of WCA 3A and the conversion of agricultural land to a STA, birds, amphibians, and reptiles would experience a long-term moderate benefit. Rehydration within these over dried areas within WCA 3A, particularly within northern WCA 3A would lead to increased production of forage prey such as small fish, crayfish, insects and other invertebrates. Small mammals including raccoons and river otters, would benefit from increased crayfish and small prey fish biomass.

The implementation of Alternative 2 or 3 may negatively affect some mammals dependent upon upland habitat since the reservoir will remove 10,500 acres of what was a FEB. It would also potentially negatively affect wading birds and other wildlife as they will likely not use the area to forage and roost as a reservoir as opposed to a FEB. The FEB in the No Action Alternative also removed upland habitat, but still allowed for animals to traverse the area when the STA was drier. Due to increased water flow and changes in water distribution, it is anticipated that overdrained areas in the northern WCA 3A would be rehydrated, triggering a vegetation transition from upland to wetland habitat. Although mammals occurring within the area are adapted to the naturally fluctuating water levels in the Everglades, there is an increased potential for this vegetation transition to have a short-term moderate, adverse, and

unavoidable effect on some mammals using upland habitat for refugia and food source. For additional information on high water closures for mammals in WCA 3A, see **CEPP PACR, Appendix C.2.2.15**. High water is a concern for deer populations within northern WCA 3A that utilize tree islands. While higher water in northern WCA 3A will not impact tree islands, deer and other upland wildlife species (bobcats, raccoons, and marsh rabbits) are mobile and would move in response to high water conditions onto tree islands and other higher ground, including levees. Habitat quality in these areas are generally less desirable, predation is greater which results in increased mortality. No significant negative effects on mammals in the remainder of the project study area are anticipated (see **Table 4-8** for more information).

#### **4.7 Essential Fish Habitat**

The Magnuson-Stevens Fishery Conservation and Management Act, 16 USC 1801 et seq. (Public Law 94-265) as amended reflects the Secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of essential fish habitat (EFH). Federal agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with the National Marine Fisheries Service (NMFS) regarding the potential effects of their actions on EFH. In conformance with the 1996 amendment to the Act, the information provided in this Environmental Impact Statement (EIS) will comprise the required EFH assessment and has been coordinated with NMFS.

Consultation for the CEPP was initiated on January 10, 2012 through a NEPA scoping letter. The NMFS has indicated that beneficial effects to fish resources and EFH may occur as a result of this project. The NMFS requested an evaluation of potential impacts to living marine resources, including mangroves, seagrasses, live bottom communities, and the marine/estuarine water column that may be impacted by activities or operations of the project action alternatives. The Corps provided an Essential Fish Habitat (EFH) assessment for the No Action Alternative in the 2014 CEPP Final PIR/EIS, which led to a result of no effects on EFH that the National Marine Fisheries Service (NMFS) concurred with through their review of the draft 2014 CEPP PIR/EIS.

##### **Essential Fish Habitat in the Project Area:**

The project area includes three distinct regional estuarine and nearshore coastal systems: The southern estuaries including Biscayne Bay and Florida Bay; and the northern estuaries including the Caloosahatchee River and the St. Lucie Estuary.

The southern estuaries comprise Biscayne National Park and a large portion of Everglades National Park, and are a shallow estuarine system (average depth less than 3 feet). Florida Bay is the main receiving water of the greater Everglades, heavily influenced by changes in timing, distribution, and quantity of freshwater flows into the southern estuaries. Lake Okeechobee discharges into the two northern estuaries. The St. Lucie Canal feeds into the St. Lucie Estuary, and the Caloosahatchee Canal/River feeds into the Caloosahatchee Estuary to the west.

Biscayne Bay and Florida Bay The southern estuaries contain essential fish habitat for corals; coral reef and live bottom habitat; red drum (*Sciaenops ocellatus*); penaeid shrimps; spiny lobster (*Panulirus argus*); other coastal migratory pelagic species and the snapper-grouper complex. Species generally present in the southern estuaries region include brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), white shrimp, spiny lobster, stone crab, gulf stone crab, red drum, Spanish mackerel, and gray snapper

(*Lutjanus griseus*). Essential fish habitat in the southern estuaries is comprised of seagrasses, estuarine mangroves, intertidal flats, the estuarine water column, live/hard bottoms, and coral reefs.

Caloosahatchee River The Caloosahatchee River estuary contains essential fish habitat for juvenile brown shrimp (*Penaeus aztecus*), juvenile gray snapper (*Lutjanus griseus*), juvenile pink shrimp (*Penaeus duorarum*), adult and juvenile red drum, (*Sciaenops ocellatus*), adult and juvenile Spanish mackerel (*Scomberomorus maculatus*), and juvenile stone crab (*Menippe mercenaria*). Downstream habitats include oyster reefs and seagrass beds (submerged aquatic vegetation).

In the St. Lucie Estuary, the proposed project is within the jurisdiction of the South Atlantic Fishery Management Council (SAFMC) and is located in areas designated as EFH for wormrock, live bottom habitat, for the American oyster (*Crassostrea virginica*); pink shrimp (*Penaeus duorarum*); white shrimp (*Penaeus* sp.) and brown shrimp (*Penaeus aztecus*); Florida red drum (*Sciaenops ocellatus*); grouper (*Epinephelus* spp.); gray snapper (*Lutjanus griseus*); white grunt (*Haemulon plumieri*); red porgy (*Pagrus pagrus*); spiny lobster (*Panulirus argus*); and the snapper-grouper complex. In addition, the nearshore hardbottom habitat outside of the St. Lucie Estuary is designated as Essential Fish Habitat-Habitat Areas of Special Concern (EFH-HAPC) for the snapper-grouper complex.

#### **Assessments of Effects on Essential Fish Habitat:**

This project is expected to have a minor beneficial indirect effect by increasing overland flow into Eastern Florida Bay. The increased flow is anticipated to stabilize the water quality and salinities required to improve and sustain nearshore biological communities. Seagrasses are expected to benefit from the re-direction and dispersion of fresh water across the wetland systems prior to entering Biscayne Bay and Florida Bay. Seagrass habitats are heavily utilized by both juvenile and adult fishes and invertebrates for feeding and shelter (SAFM 1998). Species that depend on seagrass habitats include the penaeid pink and brown shrimp, and spiny lobster (SAFM 1998). Seagrass performs as an important nursery habitat for red drum, snook (*Centropomus undecimalis*), bonefish (*Albula vulpes*), tarpon (*Megalops atlanticus*) and several species of snapper and grouper, and is critical to the health of Biscayne Bay, Florida Bay, and a number of commercial and recreational fisheries (SAFM 1998).

The restored hydrology provided by this project would also increase the periodic inundation of the downstream mangrove wetlands. Mangrove wetlands depend on this periodic inundation; the lack of freshwater from upstream sources contributes to their degradation (SAFM 1998). Mangrove habitats are important because they provide food and refuge to a large variety of species. These species include: spiny lobsters, pink shrimp, snook (*Centropomus undecimalis*), goliath grouper (*Epinephelus itajara*), tripletail (*Lobotes surinamensis*), leatherjack (*Oligoplites saurus*), gray snapper (*Lutjanus griseus*), dog snapper (*L. jocu*), sailor's choice (*Haemulon parra*), bluestriped grunt (*H. sciurus*), sheepshead (*Archosargus probatocephalus*), black drum (*Pogonias cromis*) and red drum (SAFM 1998).

The estuarine water column is typically characterized by four salinity categories: oligohaline (< 8 psu), mesohaline (8-18 psu), and polyhaline waters (18-30 psu) with some euhaline water (>30 psu) around inlets (SAFM 1998). Saline boundaries in the estuarine water column are variable, but are generally maintained by sea water transported through inlets by tide and wind mixing with fresh water supplied by land runoff (SAFM 1998). This project will improve quantity, timing, and distribution of water delivered to Eastern Florida Bay. It is likely that this will result in an improvement to the salinity characteristics of the estuarine water column. This habitat is utilized by larvae of commercially important fishes for feeding,

and is an important means of conveying organisms and nutrients from inland to offshore areas (SAFM 1998).

This project is not expected to have an effect on coral reef or hard bottom communities in the southern estuaries. There are no coral reefs or hard bottom communities located within the proposed project site or the nearshore waters affected by the project. Corals found within Florida Bay and Biscayne Bay are outside the area of potential effect.

Northern Estuaries aquatic habitats within the Caloosahatchee Basin have been altered through the channelization of the river. Nevertheless, the basin continues to support fishery resources of some recreational and commercial importance. Seagrass communities within the Caloosahatchee estuary provide critical refugia for juvenile fishes such as redfish, grouper, snook, and spotted seatrout. The decline in juvenile abundance and distribution of these and other species, along with an overall decrease in species richness may be related to the loss of seagrass habitat and/or a result of alterations in the salinity regime and the timing of the freshwater discharges from the S-79 structure. Implementation of the project would reduce the frequency of high volume freshwater discharges during the wet season, ultimately resulting in minor beneficial effects to essential fish habitat within the Caloosahatchee estuary.

Another primary goal of this project is to reduce high nutrient freshwater flows to the St. Lucie estuary. No direct impacts are anticipated, rather the restoration potential of seagrass beds, oyster reef, and the estuarine water column itself. Increases in seagrass and oyster reef would provide a large number of benefits to the essential fish habitat species. The proposed project significantly increases the acres of SAV, oyster, and healthy benthic habitat.

#### **Conclusion:**

In the Southern Estuaries, previous water management operations have resulted in an inland migration of saline conditions in both groundwater and surface waters. This has caused the expansion of moderate to high salinity zones and has diminished the spatial extent of freshwater wetland habitats in the southern estuaries. Landward expansion of saltwater and mangrove wetlands, including low-productivity, sparsely vegetated dwarf mangrove communities typical of the hypersaline 'white zone' has also occurred in the southern estuaries.

The proposed project components would improve freshwater delivery to coastal wetlands and adjacent estuaries in Northern Biscayne Bay and Eastern Florida Bay. Implementation of the project would redistribute flow to salt water wetlands and nearshore bay areas and result in favorable changes to salinity levels. These changes may affect essential fish habitat, although the impacts to the aquatic resources are anticipated to be significant and beneficial.

In the Northern Estuaries, the Caloosahatchee and St. Lucie estuaries both receive excessive discharges from Lake Okeechobee as well as their local basins during wet years, and suffer from too little discharge on excessively dry years. Restoration goals in the Caloosahatchee estuary include; re-establishment of a salinity range favorable to juvenile marine fish, shellfish, oysters and submerged aquatic vegetation (SAV), re-establishment of seasonally appropriate freshwater flows of favorable quality that maintain low salinities in the upper estuary and re-establishment of more stable salinities and ranges in the lower estuary. Restoration goals for the St. Lucie estuary include maintaining a salinity range favorable to fish, benthic

invertebrates, oysters and SAV. This requires a reduction of high volume, long duration discharge events from Lake Okeechobee, the C-44, C-23 and C-24 watersheds.

In summary, CEPP may improve conditions for estuarine and marine resources throughout the Northern Estuaries by restoring more natural timing, volume, and duration of freshwater flows to the Caloosahatchee and St. Lucie estuaries and provide minor beneficial effects. It has the potential to reduce excess nutrient loading and provide a more appropriate range of salinity conditions by reducing extreme salinity fluctuations and durations. The improvement of estuarine conditions will ultimately have a significant beneficial effect to essential fish habitat resources.

NMFS indicated that beneficial effects to fish resources and EFH may occur as a result of the 2014 CEPP Final PIR/EIS authorized plan, and the 2014 CEPP Final PIR/EIS provided an evaluation (**2014 CEPP Final PIR/EIS, Appendix C.2.2.6**). In comparison with the No Action Alternative, the CEPP New Water Modification (Alternative 3), like Alternative 2, has the potential to further reduce the frequency and volume of high-level freshwater flows from Lake Okeechobee to the Caloosahatchee River Estuary and the St. Lucie Estuary, thus reducing the potential for adverse impacts on estuarine and nearshore biota associated with essential fish habitat, providing a minor beneficial effect. These changes may affect essential fish habitat, although effects on the aquatic resources are anticipated to be minor and beneficial. A more detailed analysis of potential effects can be found in **CEPP PACR Appendix C.2.2.7** and **Appendix C.4.13**.

#### **4.8 Hydrology**

A summary of the anticipated long-term hydrologic effects of the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3), compared to the No Action Alternative, is presented in **Table 4-2**. Similarly, the hydrologic effects of the No Action Alternative are described based on comparison to the Existing Condition Baseline. A comprehensive discussion of the anticipated long-term hydrologic effects of the CEPP PACR Recommended Plan (Alternative 2) is provided in the **CEPP PACR Appendix C.2.2.8**. The summary of regional hydrologic differences includes quantitative comparisons between the No Action Alternative and Alternative 2 based on the Regional Simulation Model (RSM)-BN and RSM-GL CEPP modeling representations of the baseline and alternative. The period of simulation (1965-2005) used for the hydrologic modeling documented in the CEPP PACR, which is consistent with the 2014 CEPP Final PIR/EIS hydrologic modeling, encompasses a wide range of historical climatologic and meteorologic conditions that are representative of south Florida hydrology. This analysis period includes several moderate wet and moderate dry periods, as well as less frequent and potentially more impactful periods of both extreme high rainfall and extreme drought conditions. Updated RSM hydrologic modeling was not conducted for Alternative 3 because the RSM-BN resolution would not result any different modeling assumptions than were included in the RSM modeling of Alternative 2 previously detailed in the CEPP PACR. The determination of the directionality of the long-term hydrologic change (improvements and/or adverse hydrologic change) within each specified geographic region is principally based on the results of the ecological evaluations, where available, which are described in **CEPP PACR Section 4.2.2**. Due to the RSM-BN limitations with representing near-field seepage effects adjacent to the EAA Reservoir, the Holeyland Wildlife Management Area was additionally evaluated using the higher resolution SFWMD MIKE-SHE model. Seepage to Holey Land to the south is uncontrolled leaving the reservoir site (aside from the effects of the

EAA Reservoir passive seepage barrier) and the stage increases of 0.25 to 1.0 feet within northeast Holeyland (refer to the revised Appendix A.9) will provide beneficial effects as source water to meet the target hydroperiod in Holey Land WMA.

**Table 4-2. Effects of the Alternatives on Hydrology**

Geographic Region	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
Lake Okeechobee	<p>Moderate hydrologic change, with improvements from reducing the frequency of low lake stages and adverse effect from increasing the frequency of high lake stages. Significant stage increase of 0.25-0.50 ft. for the upper 70% of the stage duration curve, excluding extreme wet hydrologic conditions. Number of days with stages above 16 ft. NGVD is increased from 768 to 1,163 during the 1965- 2005 period of simulation.</p>	<p>Minimal additional hydrologic change, with improvements from reducing the frequency of lake stages near the top of the beneficial range and from further reducing frequency of extreme low stages. A minor adverse effect from slightly increasing the frequency of extreme high lake stages. A minor beneficial effect from having more lake stages within preferred stage envelope more frequently than the No Action. A minor adverse effect from decreasing the frequency of low lake stages in the lower portion of the beneficial range.</p>	<p>Same effects as CEPP PACR Recommended Plan (Alternative 2).</p>
Northern Estuaries	<p>Caloosahatchee Estuary: Moderate improvement. Mean monthly flows above 2,800 cfs and 4,500 cfs are reduced by 11 months and 4 months, respectively (14% and 12% reductions, respectively). Mean monthly flows less than 450 cfs are reduced by 4 months (15%).                      St. Lucie Estuary: Moderate to significant improvement. Mean monthly flows above 2,000 cfs and 3,000 cfs are reduced by 29 months and 7 months, respectively (34% and 23% reductions, respectively). Mean monthly flows less than 350 cfs are reduced by 27 months (29%).                      Additional analysis for Savings Clause requirements is provided in Annex C of this Final EIS.</p>	<p>Caloosahatchee Estuary: Moderate improvement. Mean monthly flows above 2,800 cfs and 4,500 cfs are reduced by 10 and 3 months, respectively as compared to the No Action). Mean monthly flows less than 450 cfs increase by 3 months (12%).                      St. Lucie Estuary: Moderate hydrologic change, with improvements for high volume freshwater releases and adverse effect for low volume freshwater releases. The 14-day moving average above 2,000 cfs is reduced by 14 events as compared to the No Action. Mean monthly flows less than 350 cfs are increased by 1 month.                      Provides an overall 55% reduction in discharge volumes and a 63% reduction in the number of discharge events to the Northern Estuaries from Lake Okeechobee, in conjunction with other</p>	<p>Same effects as CEPP PACR Recommended Plan (Alternative 2).</p>

Geographic Region	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
		<p>authorized projects. High flow freshwater releases lasting more than 60 days in the Caloosahatchee River Estuary (CRE) or more than 42 days in the St. Lucie Estuary (SLE) have been found to be particularly damaging to the oyster populations. The additional storage and treatment proposed would reduce the number of these freshwater releases by an additional 40% in the CRE and 55% in the SLE, in addition to the benefits provided by the No Action Alternative. The reduction in freshwater releases improves the salinity conditions in the estuary by reducing the frequency of events that exceed the preferred salinity envelope by 39% in the St. Lucie Estuary and by 45% in the Caloosahatchee Estuary.</p>	
<p>Greater Everglades: WCA 2A and WCA 2B</p>	<p>WCA 2B (2B-Y): Minor adverse effect. Stages within WCA 2B are slightly decreased by less than 0.10 ft. for wet-to-normal conditions and stages are decreased by 0.25 ft. during the driest 20% of the stage duration curve. Compared to the ECB, stages within WCA 2B are moderately improved with significant increases of 0.10-0.25 ft. under nearly all hydrologic conditions, excluding extreme wet conditions.</p>	<p>WCA 2A (2A-17): Moderate improvement. Stages are slightly increased under all hydrologic conditions especially in NW 2A which tends to stay too dry. Annual overland flow increases by 60,000 ac-ft on an average annual basis. WCA 2B (2B-Y): Negligible adverse impacts as stages within WCA 2B are slightly increased by less than 0.10 ft. between 20%-80% of the stage duration curve.</p>	<p>Same effects as CEPP PACR Recommended Plan (Alternative 2)</p>
<p>Greater Everglades: WCA 3A and WCA 3B</p>	<p>a) L-28 Triangle: Minor improvement. Stages increased by 0.1-0.2 ft. during all hydrologic conditions, excluding extreme wet conditions. b) Northwest WCA 3A (3A-NW): Major improvement. Stages</p>	<p>a) L-28 Triangle: Moderate beneficial effect as stages are increased by 0.1-0.2 ft. under normal-to-dry hydrologic conditions, with no significant change indicated for extreme wet conditions.</p>	<p>Same effects as CEPP PACR Recommended Plan (Alternative 2).</p>

Geographic Region	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	<p>are generally significantly increased by 0.6-0.8 ft.</p> <p>c) Northeast WCA 3A (3A-NE): Major improvement. Stages are increased by 0.4-0.7 ft., with no significant change during extreme wet conditions and a slight increase in stage for extreme dry conditions.</p> <p>d) East-Central WCA 3A (3A-3): Major improvement. Stages are generally increased by 0.2-0.5 ft., with no significant change during the wettest 20% of conditions.</p> <p>e) Central WCA 3A (3A-4): Minor to Moderate favorable effect. Stages are generally increased by 0.1-0.2 ft. during average to dry conditions, with a slight depth reduction during the wettest 10% of conditions and no significant change during extreme dry conditions.</p> <p>f) Southern WCA 3A (3A-28): Minor improvement. Stages are decreased by 0.1-0.2 ft. during the wettest 5% of conditions and slightly decreased during normal to dry conditions.</p> <p>g) WCA 3B (Site 71): Moderate to major improvement. Stages are increased under all hydrologic conditions, including stage increases of 0.1 ft. during the upper 20% of the stage duration curve (normal to extreme wet conditions), stage increases of 0.2-0.3 ft. for normal to dry conditions, and a slight stage increase during extreme dry conditions.</p>	<p>b) Northwest WCA 3A (3A-NW): Moderate beneficial effect as stages are increased by 0.1-0.2 ft., except in the wettest 20% of conditions. Annual overland flow increases by 47,000 ac-ft on an average annual basis.</p> <p>c) Northeast WCA 3A (3A-NE): Minor beneficial effect. Stages increased by 0.1 ft. with a minor decrease during 30% dry conditions. Annual overland flow increases by 47,000 ac-ft on an average annual basis.</p> <p>d) East-Central WCA 3A (3A-3): Minor beneficial effect. Stages slightly increased by less than 0.1 ft., with no significant change during the wettest 5% of conditions.</p> <p>e) Central WCA 3A (3A-4): Negligible effect. Stages experience a minor increase of less than a 0.1 ft. during average conditions with no significant change during extreme dry and wet conditions.</p> <p>f) Southern WCA 3A (3A-28): Minor beneficial effect. Stages are decreased by 0.1-0.2 ft. during the wettest 5% of conditions and slightly decreased during normal-to-dry conditions.</p> <p>g) WCA 3B (Site 71): Negligible effect. Peak stages exceed 9.0 ft. NGVD less than 1% of period of simulation</p>	
Greater Everglades: ENP	a) <b>Northwest ENP (NP-201):</b> Minor to moderate adverse effect. Stages are significantly decreased by 0.1-0.3 ft. under	a) <b>Northwest ENP (NP-201):</b> Stages are increased by 0.1 ft. during 30% wettest hydrologic conditions	Same effects as CEPP PACR Recommended Plan (Alternative 2).

Geographic Region	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	<p>both wet and dry hydrologic conditions; stages are slightly increased or unchanged for normal hydrologic conditions between approximately 35% and 55% on the stage duration curve.</p> <p>b) <b>Northeast ENP (NESRS-2):</b> Major improvement. Stages are significantly increased by 0.5-0.9 ft. under all hydrologic conditions.</p> <p>c) <b>Central ENP (P-33):</b> Major improvement. Stages are increased by 0.2-0.4 ft. under all hydrologic conditions.</p> <p>d) <b>Taylor Slough:</b> Minor adverse effect. Stages are slightly decreased by approximately 0.1 ft. during the wettest 20% of hydrologic conditions and slightly increased by 0.1-0.2 ft. during normal to dry hydrologic conditions.</p>	<p>b) <b>Northeast ENP (NESRS-2):</b> Minor improvement. Stages are not significantly (less than 0.1 ft.) increased under all hydrologic conditions.</p> <p>c) <b>Central ENP (NP-33):</b> Minor improvement. Stages are slightly increased under 40% wettest hydrologic condition.</p> <p>d) <b>Taylor Slough:</b> Stages are slightly increased by less than a 0.1 ft. during the driest 50% of hydrologic conditions.</p>	
Southern Estuaries	<p>a) <b>Biscayne Bay:</b> Minor-to-moderate adverse effect. Combined total average annual canal freshwater releases to central and southern Biscayne Bay are increased by 17,000 ac-ft (15%). Average annual canal freshwater releases to northern Biscayne Bay are reduced by 46,000 ac-ft (11%).</p> <p>b) <b>Florida Bay:</b> Moderate improvement. Combined average annual overland flows from southern ENP to Florida Bay (Transect 23) are increased by 23,000 ac-ft (9%).</p>	<p>a) <b>Biscayne Bay:</b> Minor beneficial effects to nearshore Biscayne Bay. Combined total average annual canal freshwater releases to central and southern Biscayne Bay are increased by 6,200 ac-ft (2%). Average annual canal freshwater releases to northern Biscayne Bay are increased by 12,000 ac-ft (2%).</p> <p>b) <b>Florida Bay:</b> Minor beneficial effects. Combined average annual overland flows from southern ENP to nearshore Florida Bay (Transect 23) are increased by 7,000 ac-ft.</p>	Same effects as CEPP PACR Recommended Plan (Alternative 2).

#### 4.9 Water Quality

During the May 2018 ASA(CW) review of the CEPP PACR the ASA(CW) determined that the CEPP PACR Recommended Plan (Alternative 2) is feasible from an engineering and construction viewpoint with significant technical, policy, and legal concerns, including concerns related to water quality that must be addressed (resulting in the CEPP New Water Modification (Alternative 3)). The main concerns regarding water quality were whether the proposed project would be environmentally compliant with applicable water quality requirements and to ensure compliance with Army policy governing water quality improvements and cost-sharing for CERP projects described in the November 30, 2007 ASA(CW) Memorandum, Subject: Comprehensive Everglades Restoration Plan, Water Quality Improvements, Policy Determination (i.e., the Woodley Memo) and consistent with cost sharing described in the 2014 CEPP PIR and authorized by Section 1401 of the 2016 WRDA and WRDA 1996.

The assessment of project impacts to water quality are summarized in **Table 4-3**. Detailed analyses for water quality regarding the CEPP PACR Recommended Plan (Alternative 2) can be found in the CEPP PACR, Appendix C.2.1, Appendix C.2.2, and Annex F. Detailed analyses addressing ASA(CW) water quality concerns identified in the May 2018 review are discussed in this section.

**Table 4-3. Effects of Alternatives on Water Quality**

<b>Geographic Regions</b>	<b>No Action Alternative (Alternative 1)</b>	<b>CEPP PACR Recommended Plan (Alternative 2)</b>	<b>CEPP New Water Modification (Alternative 3)</b>
Lake Okeechobee	Slight changes to operations not expected to result in significant WQ impacts; however, additional backflow into the lake at S-308 increases the annual phosphorus load slightly. Changes in phosphorus loads would be addressed holistically throughout the watershed via the Florida Department of Environmental Protection's Lake Okeechobee Basin Management Action Plan (BMAP) process (Section 403.067, Florida Statutes). The BMAP for Lake Okeechobee was adopted by Secretarial Order (State of FL) in 2014. The first 5-year review was completed by DEP in 2019. The development and updates of the BMAP are a public, stakeholder driven process and enforceable by Secretarial Order.	Similar to the No Action Alternative.	Similar to the No Action Alternative
Northern Estuaries	Number of low and high salinity events for Caloosahatchee and St. Lucie is reduced. Improved nutrient and dissolved oxygen conditions expected to result from reduced high flow events from Lake Okeechobee, improved Lake Okeechobee nutrient	A moderate beneficial effect relative to No Action Alternative. The number of high-flow events for the Caloosahatchee and St. Lucie Estuaries is reduced in the CEPP New Water Modification. The number of low-flow events would increase slightly in both	Same effects as the CEPP PACR Recommended Plan (Alternative 2)

Geographic Regions	No Action Alternative (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	levels, and improved estuary basin runoff quality.	estuaries but could potentially be managed with improved management of local basin runoff.. Improved salinity, color, turbidity, nutrient, and dissolved oxygen conditions are expected to result from reduced high-flow events from Lake Okeechobee.	
EAA	Use of A-2 FEB lands in project would slightly reduce total basin nutrient loads. 2014 CEPP Final PIR/EIS plan increases flows through the Central Flow path, but it also provides increased FEB storage. Based on DMSTA modeling, the additional FEB storage provided in the central flow path by 2014 CEPP (as authorized in 2016), in combination with the A-1 FEB, STA-2, and STA-3/4, is sufficient to handle the additional 2014 CEPP flows (approximately 210 kac ft/yr) and still achieve the WQBEL. However, there are still uncertainties associated with treatment of 2014 CEPP flows using the existing conveyance features, STA facilities, and portion of A-1 FEB capacity. The 2014 CEPP Final PIR/EIS adaptive management plan would address some of the uncertainties associated with operating the integrated A-1/A-2 FEB system. It is expected that the A-2 FEB would accrete peat soils and capture carbon from the atmosphere.	A minor beneficial effect relative to the No Action Alternative. The A-2 reservoir and additional A-2 STA will store and treat additional water and distribute it south of the EAA. The A-2 STA, in addition to use of the existing State-operated STAs will increase the treatment capacity and remove phosphorus from new water to improve water quality, and ensure compliance with State water quality standards, NPDES permit water quality end of pipe limits associated with each existing state STAs discharging into the Everglades Protection Area, and the new NPDES permit that will be required for the A-2 STA. Dynamic Model for STAs (DMSTA2) water quality modeling indicates that the 2012 Water Quality-based Effluent Limits (WQBEL) will be met for water leaving the A-2 STA. While uncertainties exist with any model, the DMSTA2 model was designed specifically for the South Florida Everglades STAs. Conservative model assumptions were used to model phosphorus transport and reasonable assurance measures are included in Alternative 2 to permit, monitor, and adaptively manage water quality performance. Therefore water quality standards are expected to be met by this project.	Same effects as the CEPP PACR Recommended Plan (Alternative 2)
Greater Everglades	<b>WCA 2:</b> Negligible effects. <b>WCA 3A:</b> Backfilling of northern portion of Miami Canal and re-direction of water into the northern marsh areas would result in greater uptake of nutrients and sulfate in northern WCA 3A. Increased flows and new flow patterns may result in	<b>WCA 2:</b> Similar to the No Action Alternative. <b>WCA 3A:</b> The project is expected to have minor beneficial effects on phosphorus dynamics in WCA 3A. Phosphorus loading into the northern portion of WCA 3A is expected to increase by about 30% relative to the	Same effects as the CEPP PACR Recommended Plan (Alternative 2)

Geographic Regions	No Action Alternative (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	<p>increased water column phosphorus concentrations at one or more TP rule (4 point test applicable to Everglades Protection Area) stations in the short term. The effect on TP rule compliance is uncertain; though the impact is likely to be minimal in the long term. Reduced incidence of dry out of the northern marsh should limit peat oxidation and nutrient re-mobilization. Reduced dryout in the southern marsh and maintenance of water levels in canals, especially L-67A, would also limit oxidation and resuspension. Lower phosphorus and sulfate concentrations should occur in southern WCA 3A. Redistribution of flows into the northern marsh and away from the Miami Canal may result in a change in locations of methylmercury, identified as areas where methylmercury concentrations in fish are high. It is expected that the sawgrass prairie communities north of Alligator Alley would have a higher probability of succession which suggests positive peat soil accretion and carbon capture from the atmosphere.</p> <p><b>WCA 3B:</b> Reduction in dry out events for the No Action condition would result in reduced peat oxidation / remobilization of nutrients. Additional flows into WCA 3B through the S-631 structure may result in increased water column phosphorus concentrations at one or more TP rule stations in the short term within WCA 3; however, this should have minimal impact on TP rule compliance long term. ENP: It is uncertain how changes in flow distributions proposed under 2014 CEPP would impact compliance with Appendix A of the 1992 Consent Decree. Over the long-term, distributing the flow over the northern WCA 3A marsh, reducing short-circuiting down the canals to ENP, adding more flow from the lake that is</p>	<p>No Action Alternative as a direct result of the increase in water volume even with phosphorus concentrations meeting WQBEL. The A-2 reservoir will store water and reduce pulses of water containing high nutrient concentrations, and the water will be treated by the A-2 STA, in conjunction with the existing State-operated STAs, to meet the end of pipe WQBEL for each STA, which will allow increased volumes of new water to be delivered to WCA 3A while meeting applicable water quality standards. In addition to providing water quality treatment of water released from A-2 Reservoir storage, the A-2 STA may be operated to provide water quality treatment of EAA basin runoff and Lake Okeechobee releases pulled directly from the Miami and/or North New River Canals via the A-2 Reservoir Inflow-Outflow Canal. Water leaving the A-2 STA will sheetflow across the northern boundary of WCA 3A where the L-4 levee is removed, and where the Miami Canal is backfilled. Increasing sheet flow is expected to increase nutrient uptake in the northern portion of WCA 3A due to further improvements in water depths and hydroperiods consistent with ridge and slough restoration and maintenance of peat soils. This will likely result in further reduction in phosphorus concentrations at the southern end of the WCA. Increased sheetflow coupled with longer hydroperiod would decrease soil oxidation and flux of phosphorus out of WCA 3A over the long-term, thereby decreasing internal phosphorus transport out of the WCA. Phosphorus concentrations are not expected to increase relative to the No Action Alternative, therefore effects on phosphorus concentrations would be negligible.</p> <p>A phosphorus criterion assessment conducted using a 5-year period of</p>	

Geographic Regions	No Action Alternative (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	<p>treated to the WQBEL, and distributing these flows over the marsh should result in improvements by lowering the flow weighted mean total phosphorous concentration entering the Park. In the short-term, to address the uncertainty in compliance with Appendix A, the Technical Oversight Committee (TOC) is reviewing applicability of the current Appendix A compliance methodology for incorporating new discharge points into the compliance calculations.</p>	<p>record indicates that un-impacted portions of the WCAs would be in compliance with the TP rule as applicable to the Everglades Protection Area (i.e., WCA 3). However, there is still some uncertainty on the impacts on TP rule compliance because of the limitations of predictive tools, uncertainty in the systems response to restoration, and lack of historical data that reflects the substantially altered flow and loading patterns that will occur due to restoration, however, the long-term impact is likely to be minimal and the effect to the TP Rule compliance is expected to be negligible. Reduced incidence of dry out of the northern marsh should limit peat oxidation and nutrient re-mobilization. Reduced dryout in the southern marsh and maintenance of water levels in canals, especially L-67A, would also limit oxidation and resuspension. Lower phosphorus and sulfate concentrations should occur in southern WCA 3A.</p> <p>Effects of methyl mercury in WCA 3A are expected to be similar to the No Action Alternative.</p> <p><b>WCA 3B:</b> The project is expected to have a minor beneficial effect on overall phosphorus dynamics in WCA 3B. Additional flow into WCA 3B would be expected to increase nutrient loads but spreading water over the WCA and improving sheetflows is expected to increase nutrient uptake within the WCA. Additional loading is not expected to be detrimental as long as concentrations are acceptable (i.e. no nutrient spikes over 19 ppb flow-weighted mean and a long-term flow-weighted mean of 13 ppb). In addition, the A-2 reservoir will store water and reduce pulses of water containing high nutrient concentrations and the A-2 STA will treat water to meet the WQBEL, which will also improve water quality of water delivered to WCA 3A</p>	

Geographic Regions	No Action Alternative (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
		<p>that then flows through the Blue Shanty Flow-way to ENP. Increased sheetflow coupled with longer hydroperiods would decrease soil oxidation and flux of phosphorus out of WCA 3B over the long-term, thereby decreasing phosphorus transport out of the WCA. Reduced fire risk relative to the No Action Alternative would likely reduce phosphorus and mercury releases in the water column associated with fire events. Concentrations would be expected to be similar to the No Action Alternative, therefore there is expected to be a negligible change in concentrations relative to the No Action Alternative. While there is uncertainty similar to WCA 3A regarding the TP Rule, it is unlikely that discharges into WCA 3B would cause or contribute to violations of the rule, especially as upstream phosphorus concentrations adjust to restoration efforts over the long-term, therefore the effect on the TP Rule is expected to be negligible.</p> <p>ENP: The project is expected to have a minor beneficial effect on phosphorus dynamics in ENP. Additional flow into ENP would be expected to increase nutrient loads but concentrations would be expected to be lower due to improved sheetflow in the northern and southern ENP. Increased sheetflow coupled with longer hydroperiods would be expected to decrease soil oxidation and flux of phosphorus out of WCA 3 over the long-term, thereby decreasing internal phosphorus transport to ENP.</p> <p>Effects on compliance with Appendix A of the 1992 Consent Decree are expected to be similar to the No Action Alternative.</p>	
Southern Estuaries	Improved salinity conditions expected under the No Action condition. With-project mean salinity moves closer to the target with a 2 psu decrease in the	Minor beneficial effects to salinity. Improved salinity conditions relative to No Action, with project salinity moves	Same effects as the CEPP PACR Recommended Plan (Alternative 2)

Geographic Regions	No Action Alternative (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	bay's central zone and an average salinity decrease of 1.5 psu among all bay zones for wet and dry seasons. While this appears to be a small change, this grand mean of salinity improvement (over a simulated 36 year period) is still a major step toward the restoration target.	closer to the target with a 0.05 psu decrease in Florida Bay.	

The ASA(CW) recommended validation of water quality benefits documented in **Annex F** of the CEPP PACR (i.e., the SFWMD 203 Report) specifically related to DMSTA2 modeling used to show the expected compliance of the preferred alternative with the existing WQBEL for phosphorus. Updated validation using more recent data (2008 through 2018) of the methods used to determine attainment of water quality standards further supports that the project will comply with CERP Guidance Memorandum 23 (CGM-23) on water quality consideration for PIRs. The water quality modeling performed for the CEPP PACR (Alternative 2) is the analysis carried forward for the Alternative 3—CEPP New Water Modification. As the inflow and discharge parameters remained the same, it was determined the original modeling was applicable to Alternative 3. The following general constraints identified in CGM-23 exist for all CERP project components:

- The project shall meet applicable water quality standards, including water quality criteria and moderating provisions,
- The project shall not:
  - Cause or contribute to violations of water quality standards;
  - Increase pollutant load to waters for which a Total Maximum Daily Load (TMDL) has been established unless appropriately mitigated; and,
  - Degrade water quality in Outstanding Florida Waters (OFWs), unless otherwise authorized by rule or statute.

The expected benefits from the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) include improvements on the health of the Caloosahatchee and St. Lucie estuaries due to the reduced potential for freshwater management releases from Lake Okeechobee and improved hydrology (e.g., QQTD) in the Greater Everglades ecosystem. However, there is a potential for slightly degraded water quality in the Everglades Protection Area resulting from discharging Lake Okeechobee water to WCA 3A if the STA features do not perform as expected. Potential for degrading water quality is largely associated with water quality model uncertainty, and the ASA(CW) recommended validation of water quality benefits reported in the CEPP PACR to reduce risk associated with modeling uncertainty.

A review of DMSTA model assumptions indicated model uncertainty was reduced to the maximum extent practicable by using a Corps approved model and conservative modeling approaches (see **CEPP PACR Annex F**). DMSTA was approved for use for Everglades Projects through the Corps' Engineering software validation program that is managed by the Hydrology, Hydraulics, and Coastal Community of Practice (HH&C CoP) in 2012, and the model was appropriately calibrated using data collected from STAs in the project area. Federal agencies, including the DOI and EPA also support and approved the use of DMSTA for sizing STAs to meet water quality criteria for this project. Additionally, DMSTA has been successfully applied to a number of similar projects throughout the Greater Everglades Ecosystem, including the 2014 CEPP Final PIR/EIS and SFWMD Restoration Strategies. Model validation, conducted by DOI Contractor (Dr. Bill Walker), using data collected at STA 3/4 from 2008 to 2018 indicated STA 3/4 was performing better than predicted (see **ANNEX B** of this Final EIS for validation summary). The proposed A-2 STA would be constructed in soil types similar to STA 3/4, and is expected to perform similarly. Based on these assumptions the WQBEL for water discharged from the state STAs and the STA within the preferred alternative are expected to be achieved. Model uncertainty cannot be completely eliminated because of uncertainties associated with data used in the model and the fundamental concept that models are simplified representations of a natural system, therefore additional measures would be needed to provide reasonable assurance that water quality standards would be met. SFWMD would be required to obtain an NPDES permit for the new STA (i.e., similar to the permit issued concurrently with the 2012 Consent Order OGC File No. 12-1148). In addition, water quality and ecosystem monitoring, and adaptive management are project components included in the CEPP New Water Modification designed to further reduce risks associated with modeling uncertainty to a tolerable level and provide reasonable assurance that water quality standards will be attained. Adaptive management strategies are described in the **CEPP PACR, Adaptive Management Plan, Annex D**.

The ASA(CW) directed the Jacksonville District to ensure compliance with current Army policy governing water quality improvements and cost-sharing for CERP projects. In part, Corps policy requires that projects meet water quality standards for the current use of the affected water prior to Federal O&M cost-share. Consistent with Army policy discussed in the Woodley Memo, CGM-23, and EN Regulation 1105-2-100, SFWMD must demonstrate that water entering the project meets all applicable water quality standards prior to operation of the project features. In order to ensure compliance with the Army cost-share policy, SFWMD will be required to demonstrate compliance with water quality standards for water entering the project to receive full O&M cost-share for water quality benefits. Consistent with the NPDES permits for the state STAs and the associated Consent Order, compliance with the WQBEL for the existing STAs is expected after the completion of SFWMD Restoration Strategies. Once compliance with SFWMD Restoration Strategies is demonstrated by the State, the project features would be operated to achieve benefits as authorized by WRDA 2018. The O&M cost-share amount will be calculated based the amount of new water treated by existing state facilities and O&M cost-share for the new STA is expected to be up to 50% shared between the Federal Government and non-federal sponsor. Adjustments to O&M cost-share would occur if monitoring of flows indicates flow volumes exceed or fall short of the projected volume. Construction of project features would be cost-shared 50% by the Federal Government and 50% by the non-federal sponsor.

#### 4.10 Air Quality

Comparison between the No Action and the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) results in minor beneficial effects with a decrease in dry events and subsequent fire incidence should improve air quality. Creation and rehydration of wetlands is expected to result in increased CO<sub>2</sub> sequestration through peat accretion. Negligible effects would be expected from emissions. All environmental air permits would be acquired to ensure all air quality standards are met for proposed pump stations. There could be a temporary increase in air quality degradation during construction, however, that would be resolved upon completion of construction.

#### 4.11 Hazardous, Toxic and Radioactive Waste (HTRW)

As compared to the No Action Alternative, the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would utilize the A-2 Expansion area lands (~3,000 acres) in addition to the lands addressed in the No Action Alternative. These lands would be converted to an STA with the necessary associated project components. Potential for new HTRW or pesticide applications to soils is reduced relative to the No Action Alternative for the Alternative 2 and 3 (**Table 4-4**). The expanded HTRW assessment is found in the **CEPP PACR, Appendix C.2**. HTRW reports and correspondence are found in **CEPP PACR, Annex H**. Any required corrective actions would be completed by the non-federal sponsor.

**Table 4-4. Effects of Alternatives on HTRW**

<b>Geographic Regions</b>	<b>No Action (Alternative 1)</b>	<b>CEPP PACR Recommended Plan (Alternative 2)</b>	<b>CEPP New Water Modification (Alternative 3)</b>
Lake Okeechobee	Increased development within basin may result in new HTRW sites while existing ones should continue to be remediated.	Same as No Action Alternative.	Same effects as CEPP PACR Recommended Plan (Alternative 2).
Northern Estuaries	Increased development within Caloosahatchee and St. Lucie basins may result in new HTRW sites being identified while response actions are expected to continue at existing sites.	Same as No Action Alternative.	Same effects as CEPP PACR Recommended Plan (Alternative 2).
EAA	A-2 Expansion area lands will continue to be farmed which may result in new HTRW releases on these lands as well as additional pesticide application to cultivated areas.	A-2 Expansion area lands would be converted to aquatic habitat reducing the possibility of future HTRW release on these lands having long-term beneficial effects.	Same effects as CEPP PACR Recommended Plan (Alternative 2).

<b>Geographic Regions</b>	<b>No Action (Alternative 1)</b>	<b>CEPP PACR Recommended Plan (Alternative 2)</b>	<b>CEPP New Water Modification (Alternative 3)</b>
Greater Everglades	Response actions are completed on FDEP identified HTRW sites and new sites are documented and eventually remediated. Potential for illegal waste disposal remains high.	Same as No Action Alternative.	Same effects as CEPP PACR Recommended Plan (Alternative 2).
Southern Estuaries	Response actions are completed on FDEP identified HTRW sites and new sites are documented and eventually remediated.	Same as No Action Alternative.	Same effects as CEPP PACR Recommended Plan (Alternative 2).

#### 4.12 Noise

Neither the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would result in increased noise over the No Action Alternative. Temporary short-term increases in noise during construction as compared with the No Action Alternative and amount to a less than significant effect.

#### 4.13 Aesthetics

In comparison to the No Action Alternative of a FEB, wading birds and other wildlife will likely not use the area to forage and roost as a reservoir, thereby decreasing the aesthetic value of the area.

Short- and long-term minor adverse effects to aesthetics would be expected from the storage and treatment components and the conveyance improvements. Lake Okeechobee operations, under the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3), would have long-term minor beneficial effects to aesthetics in the overall study area by improving ecological conditions.

The reservoir would reduce high volume freshwater releases into the Northern Estuaries resulting in lower suspended solids, increased water clarity, and better maintenance of healthy SAV beds. These beneficial effects would somewhat offset any minor adverse effects from the storage and treatment components and the conveyance improvements.

Short-term adverse effects would be due to the use of heavy equipment during the construction of the reservoir and supporting infrastructure, and along the canals undergoing improvements. These short-term effects would include an increase of light pollution during construction of the project. Long-term effects would be due to the establishment of a permanent man-made reservoir and STA supporting infrastructure. Long-term effects from light pollution are not expected following completion of construction.

The additional increase in water flow to the south would slightly improve the ecological structure relative to the No Action Alternative, which in turn would improve aesthetic values in southern Florida when compared to the No Action Alternative. Although natural areas in southern Florida would continue to be comprised of wetlands, sawgrass marshes, wet prairies, and tree islands, there would be an improved aesthetic value due to re-establishment of hydro patterns and sheetflow throughout the region.

#### 4.14 Land Use

The only changes resulting in significant long-term land use change are the lands being converted from agricultural use to project features, and the A-2 FEB in the No Action Alternative being converted to a deep reservoir. The A-2 Expansion area includes 3,000 acres currently leased for agriculture that would be converted to an STA or a storage reservoir.

#### 4.15 Wetlands

Almost all the future development within the study area is expected to occur on lands that are currently or formerly used for agriculture. **Table 4-5** provides the area of the project site as well as waters of the United States. Alternatives 1, 2, and 3 will involve the placement of fill material within waters of the United States. The impacts can be grouped into two categories (1) impacts from fill for levees, pump stations, or other infrastructure (i.e. fill that permanently changes a wetland or open water to an upland), (2) fill or excavation in a wetland that alters the elevation but it maintains wetland characteristics, and (3) fill or excavation of an open water to obtain elevations of adjacent wetlands. The second and third impact categories are not a permanent loss of function, it is a conversion in habitat type. The impacts to waters of the United States for each alternative are described in the following sections and **Table 4-6**. The actual wetland acreages may slightly change for each alternative as the designs of each project are completed.

**Table 4-5. Existing Habitat Area for each alternative**

Alternative	Project Site (acre)	Canals/Ditches (acres)	Wetlands (acres)	Waters of the United States (acres)
Alternative 1	14,000	560	230	790
Alternative 2	17,000	609	230	839
Alternative 3	17,000	609	230	839

**Table 4-6. Impacts to Waters of the United States for each alternative**

Alternatives	Proposed Fill for Levees		Proposed Fill and Excavation		
	Wetlands to uplands (acres)	Canals/Ditches to uplands (acres)	Wetlands to wetlands (acres)	Canals/Ditches to wetlands (acres)	Uplands to wetlands (acres)
Alternative 1	12	12	218	548	13,210

Alternatives	Proposed Fill for Levees		Proposed Fill and Excavation		
	Wetlands to uplands (acres)	Canals/Ditches to uplands(acres)	Wetlands to wetlands (acres)	Canals/Ditches to wetlands (acres)	Uplands to wetlands (acres)
Alternative 2	8.4	13.78 (5.3 from STA, 8.48 from Reservoir)	221.6	595.22	6,037
Alternative 3	8.4	14.08 (5.6 from STA, 8.48 from Reservoir)	221.6	594.92	6,037

#### 4.15.1 Alternative 1 (No Action)

The No Action alternative (Alternative 1) results in the discharge of fill in approximately 12 acres of wetlands for the construction of the levee and other infrastructure surrounding the 14,000-acre FEB. The No Action will improve the hydrology and quality of the remaining 218 acres of wetlands and create approximately 13,210 acres of additional wetlands from the agricultural lands.

#### 4.15.2 Alternative 2 (CEPP PACR Recommended Plan (Alternative C240A))

Alternative 2 results in the discharge of fill in approximately 8.4 acres of wetlands for the construction of the levee and other infrastructure surrounding the STA (no wetlands are located within footprint of Reservoir). Alternative 2 will improve the hydrology and quality of the remaining 221.6 acres of wetlands and create approximately 6,037 acres of additional wetlands from the agricultural lands.

#### 4.15.3 Alternative 3 (CEPP New Water Modification)

Alternative 3 results in the discharge of fill in approximately 8.4 acres of wetlands for the construction of the levee and other infrastructure surrounding the STA (no wetlands are located within footprint of Reservoir). Alternative 3 will improve the hydrology and quality of the remaining 221.6 acres of wetlands and create approximately 6,037 acres of additional wetlands from the agricultural lands. Impacts to wetlands for Alternative 2 and 3 are the same because the wetlands are located within the STA treatment area where the site plan is the same for both alternatives.

Alternatives 1, 2, and 3 discharge fill in comparable areas of wetlands. However, Alternative 2 and 3 convert the shallow FEB proposed in Alternative 1 to a reservoir, thereby eliminating any wetland benefits gained in that area by the No Action Alternative (a loss of 7,173 acres of created wetlands). Therefore in comparison with the No Action Alternative, implementation of either Alternative 2 or 3 would result in significant negative effects to wetlands that would have been created within the A-2 FEB.

#### 4.16 Agriculture

The project features would be placed on 3,000 acres that are currently used to cultivate sugarcane. The CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3) would minimize the impacts to agricultural lands while maximizing ecological benefits in a cost-effective

manner. In addition, an evaluation has been conducted on the South Dade conveyance system to ensure that existing levels of flood control would be maintained to support agricultural operations in Miami-Dade County. Apart from the conversion of 3,000 acres within the A-2 Expansion, based on preliminary seepage analyses conducted by the SFWMD and reviewed by the Corps (refer to **CEPP PACR, Appendix A, Revised Section A.9**), Alternative 2 or 3 are expected to have a negligible effect on agriculture relative to No Action Alternative. The CEPP PACR indicated that the A-2 Inflow/Outflow Canal would also be the primary seepage canal along the northern extent of the A-2 project footprint and that seepage would be controlled through canal operations. Following completion of additional 2-D (SlopeW) and 3-D (MIKE-SHE) Modeling in September 2019 as well as preliminary review of the A-2 STA design in October 2019, an additional (or secondary) seepage canal was proposed for inclusion in the CEPP New Water Modification (Alternative 3). The secondary seepage canal will allow the necessary operational flexibility within the A-2 Inflow/Outflow Canal during pumping operations while significantly reducing the potential for water level impacts north of the A-2 project footprint compared to Alternative 2 (CEPP PACR Recommended Plan) by maintaining water levels in line with those managed within agricultural fields to the north. Additional site-specific surveys and geotechnical investigations, including seepage modeling, will need to be conducted during the PED phase to demonstrate the effectiveness of the proposed seepage management components and/or to evaluate further design refinements necessary to achieve this performance. All PED work would be coordinated and reviewed between the Corps and the SFWMD, and approved by the Corps and SFWMD prior to construction, to ensure that the work meets Corps guidance, standards and regulations and incorporates, as applicable, SFWMD design guidance. During PED, project assurances, Savings Clause analysis and operating manuals would be updated consistent with the implementation phases, if necessary. The results of these analyses during PED may result in design modifications and/or revisions to the project total cost.

As described in **CEPP PACR, Section 5.1.8**, short-term, negligible and less than significant changes were noted for water stages within the South Dade Conveyance System; therefore no effects on agriculture within this region are anticipated. Coordination with the USDA-NRCS to meet the requirements of the Farmland Protection Policy Act, began via email on May 15, 2018 to determine how many acres of unique farmland would be affected by the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3). See CEPP PACR, Appendix C.4.12 for more information.

#### **4.17 Socioeconomics**

##### **4.17.1 Population**

Except for the anticipated socioeconomic benefits associated with improved environmental conditions in the Northern Estuaries (**Section 6.2.3**), there are negligible impacts to human populations between the No Action Alternative and the CEPP PACR Recommended Plan (Alternative 2) or the CEPP New Water Modification (Alternative 3).

##### **4.17.2 Socioeconomics: Water Supply and Flood Control**

A summary of the anticipated long-term effects on water supply and flood control of the No Action and CEPP New Water Modification is presented in **Table 4-7**. An initial PFMA was performed on Alternative 2. Recommendations from the PFMA will be addressed in PED. Additional assessment of the CEPP New

Water Modification would be completed in accordance with ER 1110-2-1156 in PED to meet federal standards for Dam safety prior to construction. The potential effects on water supply and flood control from the CEPP New Water Modification alternative is compared to the No Action Alternative. The water supply and flood control effects of the No Action Alternative are described based on comparison to the Existing Condition Baseline (**CEPP PACR, Appendix C and CEPP PACR, Annex A-2 of Appendix A**). The summary of regional hydrologic differences includes quantitative comparisons between the No Action Alternative and the CEPP New Water Modification based on the Regional Simulation Model (RSM)-BN and RSM-GL CEPP modeling representations of the baseline and alternative. The period of simulation (1965-2005) used for the hydrologic modeling documented in the CEPP PACR, which is consistent with the 2014 CEPP Final PIR/EIS hydrologic modeling encompasses a wide range of historical climatologic and meteorologic conditions that are representative of south Florida hydrology. This analysis period includes several moderate wet and moderate dry periods, as well as less frequent and potentially more impactful periods of both extreme high rainfall and extreme drought conditions.

Compared to Alternative 2, Alternative 3 includes two changes to the CEPP PACR Recommended Plan which will respectively reduce seepage losses from the EAA Reservoir and reduce potential risks to offsite flood control impacts north of the EAA Reservoir: changing of the cutoff wall material from soil-bentonite to soil-cement-bentonite; and the inclusion the addition of a secondary seepage canal (north of the Reservoir Inflow/Outflow Canal). Alternative 3, as documented and evaluated within the EIS, was formulated based on consideration of further site-specific geotechnical data collected following the CEPP PACR compilation and further analysis of the engineering properties of the subsurface materials, including hydraulic conductivity values to support the seepage analysis. The additional geotechnical data analysis from the EAA Reservoir project area was also leveraged to further refine the 2-dimensional embankment seepage modeling and 3-dimensional groundwater modeling analyses from the CEPP PACR, which enabled the USACE and SFWMD to verify the requisite seepage cutoff wall depth for the EAA Reservoir impoundment (unchanged from the CEPP PACR, as included in Alternative 2), preliminary seepage pumping capacity requirements (further analysis is planned during PED), and preliminary seepage collection canal design requirements, and to demonstrate that water table elevations within the EAA Reservoir project area can be operationally maintained at levels which do not impact adjacent landowners.

Following completion of this additional analysis for Alternative 3, updated versions of sections A.7 (Annex C.2 of the Final EIS), A.8 (Annex C.3), and A.9 (Annex C.4) of the CEPP PACR Engineering Appendix were prepared by SFWMD to document the integration of this new information for the Recommended Plan identified in this Final EIS. These revised sections for the Engineering Appendix supersede the corresponding sections in the SFWMD CEPP PACR (Annex A of the Draft and Final EIS) that accompanied the Draft EIS. The updated seepage and groundwater modeling analyses for the EAA footprint adjacent to the proposed A-2 Reservoir and A-2 STA, which is detailed within the updated section A.8 and A.9 of the Engineering Appendix, was utilized by SFWMD to develop an addendum to Annex B of the SFWMD CEPP PACR. The addendum to Annex B (Annex C.1 of the Final EIS) supplements (but does not supersede) the comprehensive, system-wide Savings Clause analysis contained in Annex B of the SFWMD CEPP PACR by providing further detailed analysis of the methods for managing the anticipated seepage losses from the A-2 Reservoir and A-2 STA for Alternative 3. Documentation of the updated engineering analyses is further described in Section 5.5 of this Final EIS and provided in Annex C of the Final EIS. Based on the period of

simulation analysis for the Alternative 2 and 3, the project modifications maintain the pre-project levels of service for flood control and water supply consistent with the requirements of the WRDA 2000 and Section 373.1501, F.S.

**Table 4-7. Effects of Alternatives on Water Supply and Flood Control**

<b>Geographic Region</b>	<b>No Action (Alternative 1)</b>	<b>CEPP PACR Recommended Plan (Alternative 2)</b>	<b>CEPP New Water Modification (Alternative 3)</b>
Lake Okeechobee and Everglades Agricultural Area	Minor-to-moderate improvement. Mean annual EAA water supply demands not met are decreased from 8% to 6%. LOSA water supply cutback percentage is increased for 1 of the 8 years with the largest water supply cutbacks.	Negligible improvement for Water Supply. Compared to the No Action, mean annual EAA water supply demands not met are decreased from 6% to 5% and for other LOSA basin demands not met decreased from 4% to 3%. LOSA water supply cutback severity, magnitude, and duration is improved when compared to the No Action for all of the 8 worst years in the POR.  Flood Control: Apart from the conversion of 3,000 acres within the A-2 Expansion, based on preliminary seepage analyses conducted for the CEPP PACR and subsequent consideration of further site-specific geotechnical data collected and analyzed after the PACR, the CEPP New Water Modification is expected to have a minor to moderate effect on agricultural lands immediately north of the EAA Reservoir relative to No Action condition. With the Inflow/Outflow Canal serving a dual function to both provide inflows to the EAA Reservoir and manage water levels within agricultural fields to the north, there is likely limited operational flexibility afforded for the Canal to maintain water levels in line with those managed within fields to the north under all conditions.	For water supply, same effects as CEPP PACR Recommended Plan (Alternative 2).  Flood Control: Apart from the conversion of 3,000 acres within the A-2 Expansion, based on updated seepage analyses, the CEPP New Water Modification is expected to have a negligible effect on agriculture relative to No Action condition. The CEPP New Water Modification will reduce seepage losses from the EAA Reservoir compared to Alternative 2 with the changed cutoff wall material (soil-cement-bentonite). The inclusion of the additional (or secondary) seepage canal within the A-2 project boundary will allow the necessary operational flexibility within the A-2 Inflow/Outflow Canal during pumping operations while significantly reducing the potential for water level impacts north of the A-2 project footprint by maintaining water levels in line with those managed within fields to the north. Additional site specific surveys, geotechnical data collection and geotechnical investigations, including seepage modeling, will need to be conducted during the PED phase to demonstrate the effectiveness of the proposed seepage management components and/or to evaluate further design refinements necessary to ensure negligible effects from the proposed reservoir.
Greater Everglades	Moderate flood control improvement. The frequency of WCA 3A stages within Zone A of the Regulation Schedule is moderately increased from	Moderate flood control improvement. Compared to the No Action, the frequency of WCA 3A stages within Zone A of the	Same effects as CEPP PACR Recommended Plan (Alternative 2).

Geographic Region	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	18% to 22% of the 1965-2005 period of simulation. Stages within the wettest 10% of hydrologic conditions, however, are generally reduced by 0.2-0.3 ft.	Regulation Schedule is moderately increased from 18% to 26% of the 1965-2005 period of simulation. Stages within the wettest 10% of hydrologic conditions, however, are generally the same or increased up to 0.2- ft.	
Lower East Coast Service Area 2 (Broward)	Negligible. No change in the number of water years with 3 or more consecutive months with restrictions. No significant changes to local groundwater stages, which are prevalent through normal-to-dry hydrologic conditions. An increased demand of 12 million gallons per day (MGD) is provided for LECSA 2.	No change from No Action.	No change from No Action.
Lower East Coast Service Area 3 (Miami-Dade)	Moderate improvement for water supply and flood control, with no anticipated adverse effects. a) Decrease of 3 water years with 3 or more consecutive months with restrictions. b) L-30 Canal stages are increased by 0.1-0.6 ft. for normal-to-extreme dry conditions; moderate reduction of 0.1-0.2 ft. for flood control stages within the wettest 10% of the hydrologic conditions, with no significant change observed for the upper 1% of the stage duration curve. c) L-31N Canal stages are increased by -0-0.2 ft. during dry conditions; significant reduction to flood control stages within the wettest 5% of hydrologic conditions. Reduced stages are indicated during the driest 5% of hydrologic conditions for areas east of L-31N and south of the 8.5 SMA. No significant changes to C-111 Canal stages between S-176 and S-18C during normal-to-dry hydrologic conditions, with a 0.1-0.2-ft increase during normal hydrologic conditions; no significant change to flood	No change from No Action.	No change from No Action.

<b>Geographic Region</b>	<b>No Action (Alternative 1)</b>	<b>CEPP PACR Recommended Plan (Alternative 2)</b>	<b>CEPP New Water Modification (Alternative 3)</b>
	<p>control stages within the upper 10% of the stage duration curve.</p> <p>d) Minor increase to stages in the wettest 10% of the hydrologic conditions for areas immediately east of Pennsuco wetlands (Miami-Dade County), with stage increases of less than 0.20 ft.</p> <p>e) An increased demand of 5 MGD is provided for LECSA 3.</p>		

### 4.17.3 Environmental Justice (EJ)

The CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) would result in similar effects as the No Action Alternative, considering the footprint is similar within the EAA area. The portion of land on the A-2 parcel that differs from the No Action Alternative is currently leased for agriculture and will be converted into a STA. Alternatives 2 and 3 may provide slight increased benefits to quality of life by improving Lake Okeechobee ecology and improving the estuarine environment. During the scoping and public meetings, no subjects or issues were presented as possible environmental effects that may be disproportionate to low income or minority populations. No home owners would be displaced by the No Action Alternative, Alternative 2 or Alternative 3. Additional information can be found in Section 5 of this Final EIS.

### 4.17.4 Recreation

Effects of the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) on recreation are presented in **Table 4-8**, with additional details provided in the **CEPP PACR, Appendix C.2.2.15. Table 4-9** provides information on when the FWC considers closures in the Everglades Wildlife Management Area (EWMA) due to high or low water stages. A closure event for these tables is one or more consecutive days when high or low water criteria are met based on the two-gage average for WCA 3A-2 and WCA 3A-3. Additionally, no effects are anticipated as a result of the proposed action that would reduce the recreational opportunities for stargazing and other activities that may involve the night sky within the project area.

**Table 4-8. Effects of Alternatives on Recreation**

Geographic Regions	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
Lake Okeechobee	No Effect. There is no impact to recreational navigation.	Minor improvements for CEPP PACR Recommended Plan based on improved recreational navigation opportunities.	Same as effects for CEPP PACR Recommended Plan (Alternative 3).
Northern Estuaries	Reduction in extremely high flows to the estuaries that currently damage fisheries would provide minor beneficial effects by enhancing utilization of the estuaries by fish and subsequently improve related to recreation opportunities such as fishing, boating and kayaking.	Minor additional beneficial effects on recreation from further reductions in high flows to the estuaries resulting from the CEPP PACR Recommended Plan. Improving estuarine conditions would increase and enhance utilization of estuaries by fish and subsequently improve related recreational opportunities such as fishing, boating and kayaking.	Same as effects for CEPP PACR Recommended Plan (Alternative 3).
EAA	The FEB feature would add approximately 14,000 acres of recreational opportunities and recreation features similar to those in	Moderate beneficial recreation effects due to the STA and reservoir features would provide increased recreational opportunities including	Same as effects for CEPP PACR Recommended Plan (Alternative 3).

<b>Geographic Regions</b>	<b>No Action (Alternative 1)</b>	<b>CEPP PACR Recommended Plan (Alternative 2)</b>	<b>CEPP New Water Modification (Alternative 3)</b>
	the Greater Everglades, providing a minor and less than significant beneficial effect.	but not limited to fishing, sightseeing, hunting, hiking, biking, and bird watching.	
Greater Everglades	<p>Improved hydrology would enhance wildlife populations through improved survival and reproduction, subsequently resulting in a minor and less than significant beneficial effect for outdoor recreation opportunities. Proposed facilities would enhance the public's ability to access into and within the Greater Everglades. Increased hydration in the very northern WCA 3A areas that have been drier could have a short-term significant, adverse and unavoidable effect on hunting (deer, hog, and rabbit). Conversely, a long term major significant benefit occurs due to increased fire protection for the peat soils, thus diminishing the potential for loss of this same area. The No Action Alternative incorporates the least negative effect on Northern WCA 3A mammal hunting opportunities. In these northern dry areas, public access is often limited to track vehicles; rehydration would increase public access through improved conditions favorable to airboats.</p> <p>Access for recreational fishing by power boat would have a major and adverse significant effect through backfilling the Miami Canal. This affects 14 of the 33 miles of the Miami Canal in the WCA 3. Fishing opportunities throughout the Greater Everglades would have a major beneficial effect by the improvements in boat access and the addition of access points around proposed structures. The removal of the L- 29 levee would create a marsh connection to L- 29 canal and enhance fishing in this canal.</p> <p>Improved trail heads for access and designation of blue and greenway trails would be positive. The Blue Shanty</p>	<p>Improved hydrology would enhance wildlife populations through improved survival and reproduction, subsequently resulting in a minor and less than significant beneficial effect for outdoor recreation opportunities. A long term significant beneficial effect is the substantial decrease in days of low water closures. This protects the habitat, recreation relies on, as it decreases the loss from oxidation and risk of fire to peat soils. In these northern drier areas, public access is often accomplished with track vehicles; the improved stages, indicated by less fire closures, would allow improved public access using airboats instead of track vehicles.</p>	Same as effects for CEPP PACR Recommended Plan (Alternative 3).

Geographic Regions	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
	<p>Levee would bisect L-67C. Recreational fishing by prop boat to the northern end of L67C canal would continue to be available from a new public boat ramp located in the northern end of L67C at the S151, providing a minor and less than significant beneficial effect. Also at the S151 a new public boat ramp would allow access into the northern 5 miles of the Miami Canal south of S151 not previously served by a public boat ramp. The Blue Shanty levee would have an airboat crossing, at full height, so as to not bisect the airboat use within WCA 3B. A boat ramp would be added near S-333 to provide access to the L- 29 canal so the L-29 divide structure does not prevent boat access. The L-29 divide structure would also serve as a pedestrian and vehicle access to the remaining L-29. The Blue Shanty Levee would serve as reroute connection for greenways trail users when the L-29 levee is removed to ensure contiguous connection east to west between S333 and S334.</p>		
EWMA	<p>High and low water closures already exist. High water closures diminish access to camps and close portions or all of a hunting season. Low water closures also restrict access to camps and while these do not occur during the hunting season this condition leaves peat soils at a higher risk of fire, effecting future recreation negatively if a fire causes a loss of habitat.</p>	<p>Increases in the number of days and events of high water during the CEPP PACR Recommended Plan create a negligible increase in closures during the hunting seasons. These increased closures occur in years where a closure during that hunting season would also be expected during the No Action, except for one occasion for two weeks in the period of record. A long term significant beneficial effect is the substantial decrease in days of low water closures. This protects the habitat, recreation relies on, as it decreases the loss from oxidation and risk of fire to peat soils. In these northern drier areas, public access is often accomplished with track vehicles; the improved stages, indicated by less fire closures, would allow</p>	<p>Same as effects for CEPP PACR Recommended Plan (Alternative 3).</p>

Geographic Regions	No Action (Alternative 1)	CEPP PACR Recommended Plan (Alternative 2)	CEPP New Water Modification (Alternative 3)
		improved public access using airboats instead of track vehicles.	
Southern Estuaries	Access to the Southern Estuaries would not change based on CEPP, however, increase in flows to Florida Bay would enhance fish populations and subsequently improve related recreational opportunities such as fishing, boating and kayaking, providing a minor beneficial effect.	Negligible effects on recreation would occur in the Southern Estuaries	Same as effects for CEPP PACR Recommended Plan (Alternative 3).

**Table 4-9. Closures Over the Period of Record in the EWMA for the No Action (Alternative 1), CEPP PACR Recommended Plan (Alternative 2), and CEPP New Water Modification (Alternative 3)**

Alternative	High Stage Closures over 41-yr POR (2 Gage avg.* > 11.6')			Fire Closures over 41-yr POR (2 Gage avg.** <= 9.16')			Total High Water and Low Water Closures			
	Closure Days	Closure Events	Avg. Closure Duration (Days)	Closure Days	Closure Events	Avg. Closure Duration (Days)	Closure Days	Closure Events	Avg. Closure Duration (Days)	% of POR-Closure
EAR No Action	614	18	34.1	203	9	22.6	817	27	30.3	5.5%
C240A (Alts 2 and 3)	779	22	35.4	115	7	16.4	894	29	30.8	6.0%

**4.18 Cultural Resources**

The area of potential effects (APE) on cultural resources for the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3), which are the same, measures approximately 34,500 acres, and is comprised of the A-1 and A-2 parcels, portion of the A-2 Expansion area, portions of the Miami Canal, and portions of the North New River (NNR) Canal. Four cultural resources surveys have been conducted for the entirety of the APE and are documented in the 2018 report by Janus Research entitled *Cultural Resource Assessment Survey of the Everglades Agricultural Area (EAA) Reservoir, Palm Beach County* (Pepe 2018); the 2016 report produced by Southeastern Archaeological Research, Inc. (SEARCH) titled *Archaeological Identification and Evaluation of the Miami and North New River Canals and a Phase I Survey in the Everglades Agricultural Area, Palm Beach County, Florida* (Austin 2016); the 2013 SEARCH report titled *Central Everglades Planning Project, Cultural Resources Investigation of Everglades Agricultural Area Cell A-2, Palm Beach County, Florida* (Austin 2013); and the 2012 report prepared by the Florida Bureau of Archaeological Research titled *A Cultural Resource Assessment Survey of the EAA A-1 Property, Palm Beach County, Florida* (Seinfeld and Rothrock 2012). These investigations

resulted in the identification of three historic properties evaluated as potentially eligible for listing in the National Register of Historic Places (NRHP); including the NNR Canal, the Miami Canal, and prehistoric site 8PB16039. An additional archaeological site (8PB16040) was identified as a result of these surveys; however, more information will be required prior to determining the NRHP eligibility of the resource. These surveys and recommendations of NRHP eligibility were consulted with the Florida State Historic Preservation Officer (SHPO), the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, and other interested parties on numerous occasions between 2011 and 2014 (DHR Project File Nos.: 2012-01115; 2012-2895; 2013-2375; 2013-4293; 2013-3571; 2013-4407; 2013-4408).

For purposes of cultural resources, Alternatives 2 and 3 effect minimal change relative to the No Action Alternative and is limited to a 3,000 acre increase to the 2014 CEPP Final PIR/EIS project footprint. Therefore, the remaining discussion will focus on the CEPP New Water Modification (Alternative 3), since it is the preferred alternative. In order to comply with Section 106 of the National Historic Preservation Act (NHPA), the Corps is currently coordinating a Programmatic Agreement with the SHPO and the Advisory Council on Historic Preservation (ACHP) to conduct a phased evaluation of historic properties during the project's design phase and prior to construction. The SHPO, ACHP, and SAJ District Engineer will sign the Programmatic Agreement in December 2019.

Pursuant to the stipulations outlined in the Programmatic Agreement, each suite of features in the CEPP New Water Modification will be subject to separate consultation and consideration of effects during PED as the APE may be subject to change based on final designs or modifications of project features. Phase II NRHP eligibility testing of site 8PB16040 and mitigation of site 8PB16039 will be required since impacts likely cannot be avoided. Impacts to historic properties may include permanent inundation and/or physical destruction or damage to properties by construction of project features. Consultation with the Miccosukee Tribe and Seminole Tribe have indicated that unnatural inundation of archaeological sites containing burial resources is considered an adverse effect to the Tribes. Conveyance improvement are unlikely to affect the NRHP eligibility of the Miami and NNR canals; however, a consideration of effects will be subject to consultation with interested parties during the PED phase of the project. A NRHP evaluation of archaeological site 8PB16040 will be initiated in fiscal year 2020 following the stipulations outline in the Programmatic Agreement. If the Corps determines that the CEPP New Water Modification will adversely affect historic properties, after reasonably considering avoidance measures, it shall notify the ACHP, SHPO, and the appropriate federally-recognized tribes of that determination, document why the effect cannot be avoided, and outline the alternatives considered to avoid and to minimize adverse effects. Avoidance of adverse effects to historic properties is always the preferred treatment approach. The Corps may conclude that the undertaking cannot be modified to minimize adverse effects, and would therefore make a determination of adverse effect and consult to resolve the effects as outlined in the Programmatic Agreement.

If the Corps determines that the CEPP New Water Modification will result in adverse effects to historic properties, the Corps, in consultation with the ACHP, SHPO, and the appropriate federally-recognized tribes, shall develop a Historic Properties Treatment Plan (HPTP) to resolve adverse effects. The HPTP shall outline the minimization and mitigation measures necessary to resolve the adverse effects to historic properties, which may include both archaeological site 8PB16039 and 8PB16040 (if determined eligible for inclusion in the NRHP).

As stated previously, consultation with the ACHP, SHPO, and appropriate federally-recognized Tribes is ongoing. In accordance with 36 C.F.R. § 800.14(b), the Corps notified the ACHP, SHPO, the Seminole Tribe of Florida, and the Miccosukee Tribe of Indians of Florida of its intention to develop a Programmatic Agreement associated with the Recommended Plan, pursuant to 36 C.F.R. § 800.14(b)(1)(ii), the ACHP and SHPO have elected to participate in the Programmatic Agreement.

The effects of the Alternatives 2 and 3 on cultural resources are presented in **Table 4-10**. These effects are preliminary and should not be considered final. Criteria used to evaluate the alternatives are found in **CEPP PACR, Appendix C.2**. A description of full preliminary analysis, background information, and descriptions of terms are presented in the **CEPP PACR, Appendix C.2.1.17**.

**Table 4-10. Effects of Alternatives on Cultural Resources**

<b>Cultural Resources</b> (Please refer to Cultural Resources in CEPP PACR Appendix C.2.1, Annex A for further details)			
<b>Geographic Regions</b>	<b>No Action (Alternative 1)</b>	<b>CEPP PACR Recommended Plan (Alternative 2)</b>	<b>CEPP New Water Modification (Alternative 3)</b>
Lake Okeechobee	No effect on cultural resources.		
Northern Estuaries	No effect on cultural resource.		
EAA, including Associated Canals and Structures	May result in long-term adverse effects on cultural resources 8PB16039 and 8PM16040.	Consistent with the No Action Alternative, the CEPP PACR Recommended Plan may result in long-term adverse effects to archaeological sites 8PB16039 and 8PB16040. Site 8PB16039 is a historic property eligible for listing in the NRHP and the NRHP eligibility of site 8PB16040 is unknown at this time. Consistent with the stipulations outlined in the CEPP EAA Programmatic Agreement, the Corps shall conduct a Phase II NRHP evaluation of site 8PB16040 and develop a Historic Properties Treatment Plan (HPTP) to resolve adverse effects resulting from the Recommended Plan to site 8PB16039. The HPTP shall outline the minimization and mitigation measures necessary to resolve the adverse effects to historic properties. Consistent with the Programmatic Agreement, if site 8PB16040 is found eligible for inclusion in the NRHP, a HPTP will be developed to resolve adverse effects resulting from the Recommended Plan.	Same as effects for CEPP PACR Recommended Plan (Alternative 2).

**4.19 Invasive Species**

Both the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) would have a negligible effect for establishment and spread of non-native invasive and

native nuisance species, similar to the No Action Alternative. Proposed management activities to address invasive species are provided in the **CEPP PACR, Annex G (Invasive Species Management Plan)**.

#### **4.20 Effects on Native Americans**

The Miccosukee Tribe of Indians of Florida (Miccosukee Tribe) and the Seminole Tribe of Florida (Seminole Tribe) rely upon the Everglades in its natural state to support their cultural, religious, subsistence, historic identity, and commercial activities. Portions of the Miccosukee Tribe's Federal Reservation lands are either partially situated or immediately adjacent to WCA 3A (See **Figure C.1-11** in the **CEPP PACR Appendix C.1**). In addition, the Tribes hold easements and leases from the State of Florida over large portions of the WCA 3A. Subsistence activities for members of the Miccosukee Tribe and the Seminole Tribe include gathering of materials, hunting, trapping, frogging, and fishing; while the Miccosukee Tribe's commercial activities additionally include frogging, airboat and other guided tours, and providing recreational and tourism facilities within the Everglades.

##### **4.20.1 Miccosukee Tribe of Indians of Florida**

General background information on the Miccosukee Tribe is provided in the **CEPP PACR Section 2.6 Native Americans**. The changes in hydrology and water quality from the final array of alternatives for areas of interest to the Miccosukee Tribe are described in more detail in the **CEPP PACR Appendix C.2.1** and **Appendix C.2.2** along with effects on species and other environmental effects.

The Miccosukee Tribe have a Federal Reservation and leased lands within the northern portion of WCA 3A. Due to the proximity of the project features to these lands, the Tribe has expressed concerns over the conversion of the FEB to a deep water storage reservoir south of Lake Okeechobee. In a letter from the Miccosukee Tribe to the SFWMD dated January 8, 2018, the Miccosukee Tribe states that FEBs provide "critical water quality benefits" that a deep reservoir cannot provide. The Miccosukee Tribe also expressed concern that discharges from the STA will not meet the Tribal Water Quality Standards of 10 ppb TP or less. The Tribe supports the CERP and the restoration of the Everglades; however, the Tribe believes that Everglades' restoration should require "more clean water". The Miccosukee Tribe asserts that the lack of water flow across Tamiami Trail has caused "discriminatory flooding of Tribal lands" and that both Alternative 2 and 3 will cause more flooding of polluted water within their reservation and leased lands. The Miccosukee Tribe recommends that the de-compartmentalization of the Everglades through construction of CEPP, the opening of the S-12 gates, and the maintenance of culverts on the L-67 and L-29 levees take priority over construction of the CEPP New Water Modification.

Based on the **CEPP PACR Appendix C.2.2** hydrologic modeling, Miccosukee reservation and leased lands are expected to have slight changes in stage conditions. The L-28 Triangle, which is located entirely within the boundaries of the Miccosukee Tribe's Reservation and encompasses 7,830 acres of Tribal lands, is projected to experience water stages slightly increased by 0.1-0.2 ft. during normal to dry hydrologic conditions, due to groundwater interactions with the down-gradient western WCA 3A marsh. Compared to the No Action Alternative, no stage increases are indicated during extreme wet hydrologic conditions within the L-28 Triangle.

Within northwest WCA 3A stages are increased by 0.1-0.2 ft. for the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) except in the wettest 20%, compared to the No Action Alternative. Similar conditions are observed for the stages within northeast and east-central WCA 3A, except in the wettest 5% for the latter. Proceeding south, likewise, no significant stage changes were observed within central and Southern WCA 3A. Compared to the No Action Alternative, average annual combined structural inflows to WCA 3B from WCA 3A are increased from 548,000 ac-ft to 578,000 ac-ft in the CEPP New Water Modification (6% increase). A water budget map for the CEPP New Water Modification, focusing primarily on the structure flows (ac-ft average annual) and locations (levee seepage flux along L-30 and L-29 is also indicated), is provided in the **CEPP PACR Figure C.2.2-40**. Compared to the No Action Alternative, average annual combined structural outflows from WCA 3B to the L-29 Canal and ENP NESRS are significantly increased from 240,000 ac-ft to 259,000 ac-ft in both Alternative 2 and 3. Also included in the WCA 3B water budget, average annual combined structural outflows from WCA 3B to the Lower East Coast (S-31 and S337) are moderately increased from 104,000 ac-ft in the No Action Alternative to 108,000 ac-ft in both Alternative 2 and 3. Peak stages within central WCA 3B exceed 9.0 ft. NGVD for only 14 days (0.10%) of the RSM-GL 1965-2005 period of simulation for the Alternative 2 and 3 (compared to 15 days for No Action Alternative), and WCA 3B stages are above 8.0 ft. NGVD for approximately 27% of the period of simulation.

The CEPP PACR Recommended Plan as presented in the **CEPP PACR Annex F, Phosphorus Assessment**, has the potential for slightly degraded water quality conditions from freshwater releases into WCA 3A if the proposed A-2 STA does not perform as expected. Additionally, if STA diversions are not eliminated, untreated water bypassed to WCA 3A could degrade water quality. However, bypasses are not expected based on modeling results and the proposed operational plan; therefore, the STA is expected to meet water quality objectives which should result in a net improvement in water quality. This also applies to the CEPP New Water Modification (Alternative 3).

In order to discuss changes from the No Action Alternative to the Alternative 2 and 3, Government to Government consultation between the Corps and the Miccosukee Tribe was initiated by letter on April 18, 2018. A Government to Government consultation meeting between the Corps and the Miccosukee Tribe was held on July 19, 2018. On July 17, 2018, the Tribal Chairman sent a letter to the Jacksonville District Commander outlining Tribal comments on the CEPP New Water Modification (**Appendix C**). The Miccosukee Tribe maintains its strenuous opposition to both Alternative 2 and 3. The Miccosukee Tribe objections are summarized as follows:

“The Miccosukee Tribe believe that the CEPP PACR Recommended Plan would continue the use of Tribal lands (federal Indian Reservation, perpetual lease lands in WCA 3A, and permitted use and occupancy areas along the northern boundary of ENP [Miccosukee Reserved Area]) as a biological filter to treat upstream pollution. An influx of polluted water would destroy the natural balance of aquatic flora and fauna which support the Miccosukee way of life. Any federal agency, policy, or action that discharges polluted water into Tribal lands negatively effects Tribal members, Tribal way of life, the Tribe’s identify, and Tribal subsistence and commercial activities. Outflows from the A-2 STA and the A-2 Reservoir can be conveyed by the Miami Canal or the North New River Canal which discharge into Tribal lands; therefore, discharges must meet the EPA

approved water quality standards for the areas that will be impacted by these discharges. The Miccosukee Tribe's nutrient standard is consistent with natural oligotrophic levels and a total phosphorus limitation of 10 ppb. The Miccosukee Tribe asserts that the use of WCA 3A should be prohibited from being used as a "Mixing Zone" or a "biological filter" with respect to nutrient removal. The Miccosukee Tribe request that the WQBEL be measured from the point of discharge and not a "network of stations" or "four part test" which results in Tribal lands being used as a "Mixing Zone". The Miccosukee Tribe believe that the CEPP PACR Recommended Plan as currently proposed would not comply with environmental compliance requirements and therefore should not be supported or approved by federal agencies.

The Miccosukee Tribe also objects to the flooding of Tribal lands. The Miccosukee Tribe does not believe that downstream infrastructure was designed to handle an increase of 160,000 acre-feet of water and consequently has a high risk of failure. Consequently, the Miccosukee Tribe believes the CEPP PACR does not adhere to Corps dam safety requirements for potential failure mode and life loss consequence analysis. Additional conveyance must precede the construction of the CEPP PACR Recommended Plan in order for SFWMD and the Corps to maintain the WCA 3A regulation schedule and prevent the inundation of tree islands. The CEPP PACR Recommended Plan increases the delivery of water volume into the dry season and thereby extending the hydroperiod of tree islands on Tribal lands. Without the capacity to pass excess water from WCA 3 into the ENP, the Miccosukee Tribe is concerned that water will stack in WCA 3 A and cause loss of tree islands. The Miccosukee Tribe states that "the federal court has already rejected the argument the benefits of hydropattern restoration outweigh compliance with water quality requirements."

The Corps presented to the Tribe on October 25, 2019, that the effects of an additional 160,000 acre-ft of water into northern WCA 3A would improve hydroperiods in this overdrained area. The presentation also showed modeling results that confirm the original proposed CEPP conveyance improvements South from WCA 3A to 3B to ENP were enough to prevent increase in water depth in central and southern WCA 3A tree islands.

The Miccosukee Tribe are concerned, as s described above, there would be increased phosphorous in Miccosukee lands and would result in a violation of Tribe water quality standards. Alternative 2 and 3 would result in a 43% increase in flows into Tribal lands and a 36% increase in phosphorous loadings. The Miccosukee Tribe position is that they were assured an 80% phosphorous load reduction as part of the Settlement Agreement, entered into by the federal government, the State of Florida, and the SFWMD, and the subsequent Consent Decree.

The Miccosukee Tribe believes that federal policy precludes cost-share for the CEPP New Water Modification since the new water for the CEPP New Water Modification is coming from Lake Okeechobee and considers the requirement to meet existing water quality standards a responsibility of the State of Florida. Additionally, the Miccosukee Tribe also believe that provisions set forth in Laws of Florida, Chapter 2017-10 which precludes the use of eminent domain for use in the this project does not apply to the Corps. The Miccosukee Tribe believes the Corps should conduct an alternatives analysis that considers

larger tracts of land that does not adversely affect cultural resources or disproportionately affect the Miccosukee Tribe.

Water quality impacts were further discussed with the Miccosukee Tribe in a Government to Government meeting held on October 25, 2019. The Corps explained that the water quality loading increase was related to the increased volume of water being sent south. Because the water would meet the WQBEL of 13 ppb coming out of the existing state STAs and would spread out along a 3-4 mile stretch of northern WCA 3A, additional nutrient loading from the increased volume of water is not expected to increase total phosphorus concentrations further South in WCA 3A. During that meeting the Miccosukee Tribe requested monitoring stations to measure water quality be placed near the northern boundary of the Miccosukee Reservation so that potential impacts to water quality on Tribal lands from the project could be assessed and provide assurances to the Tribe that water quality would not be impacted. The Tribe requested two water quality monitoring stations; one located at the northeast corner of the North Grass Region, north of the Miccosukee Reservation, and one located approximately three miles west of the northeast corner of the Reservation. To protect Tribal Trust Resources, the Corps and SFWMD will monitor for water levels and quality to inform project implementation and operations in order to protect tree islands and flora, fauna on the Miccosukee Tribe of Indian's reservation in WCA 3A. Monitoring and adaptive management measures are described in the monitoring and adaptive management plan developed for the CEPP PACR and modified with the CEPP New Water Modification Plan to include additional water quality monitoring and coordination. To address this, the Corps and SFWMD propose to form a technical working group to include the Miccosukee and Seminole Tribes to develop a monitoring plan to characterize the effects of the project and address both Tribes' water quality concerns. Exact placement of water quality stations will be determined during coordination with the technical working group and baseline sampling will begin prior to implementation of project features. The monitoring stations will identify if the water quality being delivered to Tribal lands is being degraded by the Federal project. If it is determined that the Federal project is degrading the water quality delivered to Tribal lands, additional measures will be evaluated and implemented (see **CEPP PACR, Adaptive Management Plan, Annex D**).

#### **4.20.2 Seminole Tribe of Florida**

General background information on the Seminole Tribe is provided in the **CEPP PACR Section 2.6**. The changes in hydrology from the final array of alternatives for areas of interest to the Seminole Tribe are described in more detail in the **CEPP PACR Appendix C.2.1** and **Appendix C.2.2.9.2** along with effects on species and other environmental effects.

The Seminole Tribe has six reservations located in Florida. The reservations include Brighton, Tampa, Fort Pierce, Immokalee, Hollywood, and Big Cypress. Two reservations of the Seminole Tribe rely on Lake Okeechobee as a secondary supplemental irrigation supply source for their surface water. The Seminole Tribe's Big Cypress Reservation has specific volumes of water identified for this purpose. The Brighton Reservation has an operational plan addressing water shortage conditions. The Seminole Tribe has surface water entitlement rights pursuant to the 1987 Water Rights Compact between the Seminole Tribe of Florida, the State of Florida, and the SFWMD. Pursuant to the Seminole Indian Land Claims Settlement Act of 1987 (Public Law 100-228), the Compact shall have the force and effect of Federal law for the purposes

of enforcement of the rights and obligations of the tribe. Additional documents addressing the Water Rights Compact entitlement provisions have since been executed. These documents include a 1996 Agreement between the SFWMD and the Seminole Tribe of Florida Providing for Water Quality, Water Supply and Flood Control Plans for the Big Cypress Seminole Reservation and the Brighton Seminole Indian Reservation, Implementing Sections V.C. and VI.D. of the Water Rights Compact and a SFWMD Final Order on Seminole Tribe of Florida’s Entitlement for the Big Cypress Seminole Indian Reservation.

Based on the **CEPP PACR (Appendix C.2.2)** alternative modeling assumptions regarding Lake Okeechobee operational flexibility and the resulting general moderate stage increases within Lake Okeechobee, the percentage of water supply demand not met for the Brighton Reservation by Alternative 2 and 3 (same effects) is shown to slightly decrease by approximately 0.9% compared to the No Action Alternative (**CEPP PACR Figure C.2.2-55**). The percentage of water supply demand not met for the Big Cypress Reservation is shown to be slightly reduced by approximately 0.6% compared to the No Action Alternative (**CEPP PACR Figure C.2.2-56**) for Alternative 2 and 3. Impacts to STOF water supply are not expected for as a result of Alternative 2 or 3 based on the hydrologic modeling.

In order to discuss changes from the No Action Alternative to Alternative 2 and 3 (effects the same), Government to Government consultation between the Corps and the Seminole Tribe was initiated by letter on April 18, 2018. A consultation meeting was held on May 1, 2018 between the Corps and the Seminole Tribe, wherein the Seminole Tribe requested continued consultation throughout the development of the Draft EIS. Consultation is ongoing and will continue with release of this Final EIS.

**4.21 Cumulative effects**

Cumulative effects are defined in 40 CFR 1508.7 as those effects that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. **Table 4-11** summarizes past, present, and projected Corps efforts that cumulatively affect the regional environment of south Florida.

**Table 4-11. Past, present, and reasonably foreseeable future actions and plan affecting the project area**

-	Past Actions and Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
<b>Status of Non-CERP Projects</b>	<ul style="list-style-type: none"> <li>- C&amp;SF Project (1948)</li> <li>- ENP Protection and Expansion Act (1989)</li> <li>- MWD GDM and Final EIS (1992)</li> <li>- C-111 South Dade GRR (1994)</li> </ul>	<ul style="list-style-type: none"> <li>- SFWMD Restoration Strategies Project</li> <li>- MWD 8.5 SMA GRR (2000)</li> <li>- MWD Tamiami Trail Modifications Limited Reevaluation Report (2008)</li> <li>- C&amp;SF C-51 West End Flood Control Project</li> <li>- Kissimmee River Restoration</li> <li>- Seepage Barrier near the L-31 N Levee (Miami-Dade)</li> </ul>	<ul style="list-style-type: none"> <li>- SFWMD Complete Restoration Strategies Project</li> <li>- MWD Closeout</li> <li>- Tamiami Trail Modifications Next Steps (TTMNS) Project, Phase 2</li> </ul>

-	Past Actions and Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
		Limestone Products Association) - Tamiami Trail Modifications Next Steps (TTMNS) Project, Phase 1 - SFWMD Florida Bay Initiatives - C-111 South Dade Project (Contracts 8, 8A, and 9)	
<b>Operations Plan for Lake Okeechobee, WCA 3A, ENP and the SDCS</b>	- Water Supply and Environment (WSE) Lake Okeechobee Regulation Schedule (2000) - IOP 2002 to 2012 ERTTP	- Lake Okeechobee Regulation Schedule (LORS 2008) - SFWMD LEC Regional Water Supply Plan - ERTTP October 2012 until replaced by COP; temporary planned deviations included Increment 1 and Increment 1.1 and 1.2 and 2 Operational Strategies - Herbert Hoover Dike Dam Safety Modification Study (HHD DSMS) risk reduction measures (2011 through 2022)	- LORS 2008 to be replaced by revised Lake Okeechobee System Operating Manual by 2022 - SFWMD periodically revises the LEC Regional Water Supply Plan
<b>CERP Projects</b>		Congressional Authorization Received: - Broward County Water Preserve Areas Project - Caloosahatchee River (C-43) West Basin Storage Reservoir - Central Everglades Planning Project (CEPP), as amended by the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida authorized in Section 1308(a) of WRDA 2018 (construction conditioned on Secretary preparing a report as specified in the Section 1308(b) of WRDA 2018) Congressional Authorization Received and Construction in Progress:	Future CERP Projects: - Lake Okeechobee Watershed Restoration Project - Western Everglades Restoration Project - Biscayne Bay Coastal Wetlands Phase 2 - C-111 Spreader Canal Project Phase 2

-	Past Actions and Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
		<ul style="list-style-type: none"> <li>- Central Everglades Planning Projects (DOI removal of portions of Old Tamiami Trail roadway and SFWMD increased capacity of S-333N</li> <li>- Indian River Lagoon-South Project</li> <li>- Picayune Strand Restoration Project</li> <li>- Site 1 Impoundment Project</li> <li>- Biscayne Bay Coastal Wetlands Project Phase 1</li> <li>- C-111 Spreader Canal Western Project (operated by SFWMD)</li> </ul>	

**Table 4-12. Summary of Cumulative Effects.**

Hydrology	
<b>Past Actions</b>	Flood and water control projects have greatly altered the natural hydrology.
<b>Present Actions</b>	Federal and State agencies are coordinating on and implementing projects to improve hydrology.
<b>Proposed Action</b> (CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) have the same effects)	Additional reductions in high volume freshwater releases from Lake Okeechobee to the Northern Estuaries would be realized by the CEPP New Water Modification compared to the No Action Alternative. Further beneficial hydrologic effects within the Greater Everglades compared to the No Action Alternative by way of additional “new water” to facilitate restoration of sheetflow and rehydration of previously drained areas. Improved hydrologic conditions will result from increasing depths and extending hydroperiods in WCA 3A, WCA 3B, and ENP.
<b>Future Actions</b>	Additional CERP projects propose to restore hydrology to more natural conditions (example – Lake Okeechobee Watershed Restoration Project (LOWRP) and the Western Everglades Restoration Project (WERP)). In addition, future refinements to water control manuals such as the Combined Operational Plan, Kissimmee River Headwaters and future updates to the Lake Okeechobee Regulation Schedule will further improve hydrology within the Northern Estuaries and Greater Everglades.
<b>Cumulative Effect</b>	Although it is highly unlikely that natural hydrologic conditions would be fully restored to pre-drainage conditions in most of the Everglades, improved hydrology would occur. Improved resilience to the overall ecology of the Greater Everglades ecosystem should occur. CERP is expected to improve the quantity, quality, timing, and distribution of freshwater flow.
Threatened and Endangered Species	
<b>Past Actions</b>	Water management practices, importation of exotic species, and urbanization have contributed to the degradation of existing habitat function and direct habitat loss leading to negative population trends of threatened and endangered species.

<b>Present Actions</b>	Ongoing efforts have been made by Federal and State agencies to implement projects to improve hydrology within the project area. Ongoing projects have been implemented to avoid jeopardy to or minimize incidental take of threatened and endangered species and their designated critical habitat. The USFWS recovery plan is used as a management tool.
<b>Proposed Action</b> (CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) have the same effects)	The Corps determined that the CEPP New Water Modification may affect, but is not likely to adversely affect, Everglade snail kite, caracara, and wood stork; and it may affect Florida panther and Eastern indigo snake. No effects are expected to occur to critical habitat as such the CEPP Adaptive Management and Monitoring Plans have been updated for the CEPP New Water Modification (see <b>Appendix A of this Final EIS</b> ).
<b>Future Actions</b>	Ongoing CERP restoration projects are continuing to be developed and would be implemented to improve overall Everglades' habitat to avoid jeopardy to or minimize incidental take of threatened and endangered species and their designated critical habitat
<b>Cumulative Effect</b>	Habitat improvement, monitoring and management of threatened and endangered species are anticipated to allow populations to be maintained. Improvement of degraded populations is expected to be facilitated by the restoration and enhancement of suitable habitat through efforts to restore more natural hydrologic conditions within the project area.
<b>Fish and Wildlife Resources</b>	
<b>Past Actions</b>	Water management practices have resulted in aquatic vegetation community changes and a resultant disruption of aquatic productivity and function that has had repercussions through the food web, including effects on wading birds, large predatory fishes, reptiles and mammals.
<b>Present Actions</b>	Ongoing efforts have been made by Federal and State agencies to implement projects to improve hydrology within the project area to restore habitat conditions for fish and wildlife resources.
<b>Proposed Action</b> (CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) have the same effects)	Negligible effects to fish and wildlife resources within Lake Okeechobee would be expected. Further reductions in the number of high volume freshwater releases to the Northern Estuaries, above reductions provided by the No Action Alternative are anticipated to improve suitable habitat for key indicator species such as oysters and seagrasses. In the EAA, the No Action Alternative includes a FEB, which would provide benefits to wading birds. The CEPP New Water Modification converts the FEB to a reservoir, thereby reducing the available foraging and nesting opportunities for wading birds. The CEPP New Water Modification would provide additional beneficial effects within the Greater Everglades by sending increased levels of "new water" south above those provided by the No Action Alternative. Rehydration within previously dry areas of WCA 3A and ENP would increase the spatial extent of suitable habitat for several fish and wildlife resources. Increases in forage prey availability (crayfish, other invertebrates, and fish) would directly benefit amphibian, reptile, small mammal, and wading bird species. Nesting and foraging activities of resident bird species are anticipated to be significantly improved. There would be an effect on mammals currently utilizing upland habitat compared to the effects of the No Action Alternative, due to the change in a FEB to a reservoir. Further increased freshwater flows to Florida Bay would provide minor incremental improvement in suitable habitat for pink shrimp, juvenile spotted sea trout, sea turtles, manatee and crocodiles among other species.

<b>Future Actions</b>	Some level of improvement to fish and wildlife resources is expected to occur as a result of implementation of projects with the capability of improving the timing, quantity, quality, and distribution of freshwater flow to the study area. Hydrologic restoration planned as part of CERP would further improve fish and wildlife habitat.
<b>Cumulative Effect</b>	Habitat improvement efforts are anticipated to benefit fish and wildlife resources.
<b>Vegetation and Wetlands</b>	
<b>Past Actions</b>	Drainage of Florida's interior wetlands, conversion of wetlands to agriculture, and urban development has reduced the spatial extent and quality of wetland resources.
<b>Present Actions</b>	Efforts are being taken by State and Federal regulatory agencies to reduce wetland losses.
<b>Proposed Action</b> (CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) have the same effects)	Negligible effects to vegetation within Lake Okeechobee are anticipated. Further reductions in the number of high discharge events to the Northern Estuaries above those provided by the No Action Alternative are anticipated to further improve conditions for oyster and seagrass beds. In the A-2 Expansion area 3,000 acres of agricultural lands would be converted to freshwater wetlands improving the habitat. Additional beneficial effects are anticipated within the Greater Everglades above those provided by the No Action Alternative. Additional "new water" would further improve hydrologic conditions within WCA 3A and ENP and would support further reductions in soil oxidation, promoting peat accretion necessary to rebuild the complex mosaic of habitats across the landscape. Increased freshwater flows to Florida Bay would aid to lower salinity levels, benefiting mangrove communities and seagrass beds. The CEPP New Water Modification is reducing the number of potential wetlands from a 14,000 acre FEB of No Action to a 10,500 acre reservoir and 6,500 acre STA. The reduction in 10,500 acres of FEB to reservoir will reduce the amount of wetlands and vegetation within that area.
<b>Future Actions</b>	Some level of improvement to vegetative communities is expected to occur as a result of implementation of projects with the capability of improving the timing, quantity, quality and distribution of freshwater flow to the study area. More natural hydrology as part of the CERP would assist in restoring natural plant communities.
<b>Cumulative Effect</b>	While the spatial extent of natural plant communities would not be restored to historic proportions, the quality of vegetative communities would be improved.
<b>Cultural Resources</b>	
<b>Past Actions</b>	Flood and water control projects, conversion of wetlands into agriculture and urban development have had adverse unmitigated effects to cultural resources either directly or indirectly.
<b>Present Actions</b>	Ongoing efforts have been made by Federal and State agencies to implement projects to improve hydrology within the project area, thereby stabilizing the tree islands which are known to have a high potential for cultural resources.
<b>Proposed Action</b> (CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) have the same effects)	The CEPP New Water Modification may result in major long-term adverse effects on cultural resources sites 8PB16039 and 8PM16040. Mitigation of effects for historic property 8PB16039 potentially reduced to no effect. Mitigation of effects for culturally significant site 8PM16040 is unknown. Additional cultural resource surveys are needed on the A-2 Expansion area to determine if culturally significant sites exist.

<b>Future Actions</b>	Continued improvement to hydroperiods and sheetflow within WCA 3A, 3B and ENP could reduce soil oxidation, which could stabilize the environment, and this in turn could stabilize tree islands containing cultural resources.
<b>Cumulative Effect</b>	While adverse effects to one historic property is anticipated as a result of the CEPP New Water Modification, the continued improvement of hydroperiods and sheetflow has the potential to result in beneficial cumulative effects to numerous historic properties and culturally significant sites within the Everglades.
<b>Water Quality</b>	
<b>Past Actions</b>	Water quality has been degraded from urban, suburban, commercial, industrial, recreational and agricultural development.
<b>Present Actions</b>	Efforts to improve water quality from agricultural areas is ongoing. Federal and State projects would temporarily elevate localized levels of suspended solids and turbidity. Unimpacted portions of the Everglades WCAs passed all four parts of the State's TP rule as indicated in the most recent five-year TP criterion assessment. Currently more than 90% of the Everglades Protection Area is at or below 10 ppb phosphorus.
<b>Proposed Action</b> (CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) have the same effects)	Implementation of the CEPP New Water Modification is not expected to significantly affect the water quality of Lake Okeechobee. In the Northern Estuaries, improvements to salinity should be seen due to further reductions in high-flow events. The increases in flow to WCA 3A, 3B and ENP as a result of the CEPP New Water Modification should not affect TP Rule compliance, however some uncertainty exists. Short-term impacts could occur with TP Rule compliance tests while the marsh adjusts to conditions imposed through implementation of the CEPP New Water Modification but long-term impacts are not expected. Over the long-term, adding more flow from the lake and EAA basin that is treated to the WQBEL should result in improved water quality within WCA 3 and a reduction in flow-weighted mean total phosphorus concentration entering the ENP. Southern Estuaries salinity conditions are expected to be slightly improved by the CEPP New Water Modification.
<b>Future Actions</b>	Actions by the State of Florida's Restoration Strategies would decrease nutrient concentrations and loadings to the project area. Lake Okeechobee Regulation Schedule updates and development of the Combined Operating Plan (COP) for Modified Water Deliveries, and the Broward County Water Preserve Areas (BCWPA) Project could indirectly affect water quality in WCA 3.
<b>Cumulative Effect</b>	While anthropogenic effects on water quality are unlikely to be eliminated, water quality is expected to improve over existing and recent past conditions. During detailed planning and design, the USACE and SFWMD are committed to ensuring that project feature implementation will not result in violations of water quality standards. Reasonable assurances for water quality included with the CEPP New Water Modification include water quality monitoring, and adaptive management. A requirement for an NPDES permit for the A-2 STA will allow Federal oversight.
<b>Water Supply/Flood Control</b>	
<b>Past Actions</b>	Water supply and flood control for agricultural and urban users has benefited from construction and operation of the C&SF Project.

<b>Present Actions</b>	Availability of water from Lake Okeechobee for agricultural users was altered through implementation of 2008 LORS. Availability of water for urban and agricultural users was altered through implementation of E RTP. The SFWMD has implemented Restricted Allocation Area Rules to cap users dependent on water supplies from Lake Okeechobee and the regional system (the Everglades).
<b>Proposed Action</b> (CEPP PACR Recommended Plan (Alternative 2) and CEPP New Water Modification (Alternative 3) have the same cumulative effects)	Additional storage or hydrologic improvements is expected to reduce the severity and duration of water restrictions. Additional site-specific surveys, geotechnical data collection and geotechnical investigations, including seepage modeling, will need to be conducted during the PED phase to demonstrate the effectiveness of the proposed seepage management components and/or to evaluate further design refinements necessary to ensure negligible effects from the proposed reservoir.
<b>Future Actions</b>	Future supplies would not change unless additional storage or hydrologic improvements are implemented and increase water availability.
<b>Cumulative Effect</b>	While effects on water supplies are unlikely to improve, water supplies available for agricultural and urban users are expected to remain stable until additional storage mechanisms are implemented.

#### 4.22 Incomplete or Unavailable Information

The analyses provided in this document are based upon current knowledge of the physical and biological conditions in the action area and on projections of the most probable future conditions, as indicated by hydrologic models. The Corps recognizes that there is uncertainty in the predictions derived from these models that stems from input variability and measurement errors, parameter uncertainty, model structure uncertainty and algorithmic (numerical) uncertainty. These uncertainties are also translated into uncertainty as to whether the specific performance indicators and measures used to characterize the overall system performance actually capture that overall performance. The outputs of the sub-regional hydrologic models used to assess projected hydrologic changes and to quantify ecosystem benefits were the best data available to predict the most likely hydrologic changes as a result of the project. Even though uncertainty is recognized, ecological benefits derived from performance measure metrics are useful in making planning level decisions. These values provide a quantitative means for comparing alternatives to identify the best performing alternative.

Technical information or models were applied in evaluating project alternatives. An Adaptive Management approach during implementation of the CEPP New Water Modification, documented in the **CEPP PACR, Annex D**, will provide new information to address uncertainties and risks over time, decrease the potential for costly mistakes, and ultimately support fulfillment of restoration goals and objectives.

#### 4.23 Unavoidable Adverse Environmental Effects

As discussed under each resource in **Section 5.2**, the incremental adverse effects associated with implementing the CEPP PACR Recommended Plan (Alternative 2) and the CEPP New Water Modification (Alternative 3) compared to the No Action Alternative are expected to range from negligible to moderate. Potential unavoidable adverse impacts that would result from implementation of either Alternative 2 or 3 include temporary, short term impacts to air quality, the noise environment, and aesthetic resources

from operation of construction equipment through lands designated for staging, access and construction. Temporary disturbances to and displacement of fish and wildlife resources to other nearby habitat would occur during construction within the agricultural fields and ditches. In addition, adverse effects include loss of wetland habitat that would have been created under the No Action Alternative as the A-2 FEB to deep storage reservoir (10,500 acres). In addition, due to this conversion, there is a removal of upland habitat that changed the species effect determination for the Florida panther from a may affect, not likely to adversely affect, to a may affect determination as panthers cannot forage or traverse a deep storage reservoir. Finally in comparison with the No Action Alternative there are also unavoidable negative effects on aesthetics due to construction of a 37.1 foot high perimeter levee surrounding the A-2 Storage Reservoir.

These adverse effects are offset to some degree by beneficial effects to fish and wildlife resources anticipated under Alternative 2 and 3. Due to increased water flow and changes in water distribution, it is anticipated that overdrained areas in northern WCA 3A will be rehydrated, triggering a minor vegetation transition from upland to wetland habitat. Although mammals occurring within the action area are adapted to the naturally fluctuating water levels in the Everglades, there is a slightly increased potential that mammals currently utilizing upland habitat may be negatively affected.

Non-native and invasive plant infestations in the project area may be exacerbated by soil disturbance during construction in the construction footprint and may require active management. Implementation of Alternative 2 or 3 is not expected to have an observable effect on non-native vegetative species as compared to the No Action Alternative

Conversion of the additional 3,000 acres of land on the A-2 parcel from agriculture to a water storage reservoir and STA would result in the permanent loss of designated prime and unique farmland. Cultural Resource surveys will be completed prior to final design of the project. Pursuant to 36 CFR 800.1, where possible, the project design will be modified to avoid impacting significant historic properties and culturally significant sites. Where avoidance is not possible, other mitigation measures will be considered. If unavoidable resources are identified, mitigation measures will be developed during the PED phase in consultation with the SHPO, tribal groups, and other interested parties as established in implementing regulations for Section 106 of the NHPA.

#### **4.24 Irreversible and Irretrievable Commitment of Resources**

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost permanently. An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. Construction of the proposed project will include features considered permanent and may be deemed irreversible. This would include project features in the EAA for storage and treatment features that would change the distribution and conveyance (location, direction, depth, volume, quality, timing and distribution) of the available water. Resources to be committed if the project is approved include expenditure of State and Federal funding, labor, energy and project materials to build, operate and maintain the proposed project.

## 4.25 Mitigation

As a matter of policy the Corps, Regulatory Division does not issue itself Permits under any of the regulatory authorities it administers Sections 9 and 10 of the 1899 Rivers and Harbors Act, Section 404 of the Clean Water Act and Section 103 of the Ocean Dumping Act). Unless otherwise exempted (e.g., Section 404(r)), the Corps, Civil Works program complies with the same laws that apply to applications for Corps Regulatory permits.

If a party other than the Corps Civil Works program, usually the local sponsor, opts to construct the project in lieu of the Corps (Civil Works) that party needs a permit. The regulatory element may write a permit to the party that will be responsible for the construction based on the information developed by the planning element.

The Regulatory process should not duplicate evaluation steps performed as part of the Planning process. Therefore, both the regulatory requirements and the civil works requirements are described in one EIS. This section describing Mitigation is a requirement for the Corps' Regulatory process.

As defined by the Council on Environmental Quality, Title 40 Code of Federal Regulation (CFR) §1508.20, mitigation requirements include the following:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impacts over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impacts by replacing or providing substitute resources or environments.

For the project proposed to be constructed by the SFWMD, mitigation measures were identified as environmental commitments and wetland compensatory mitigation, which are discussed in the following sections.

### 4.25.1 Environmental Commitments

Best Management Practices:

To avoid affecting the surrounding environments, the SFWMD commits to avoiding, minimizing, or mitigating for adverse effects during construction activities by implementing standard construction best management practices (BMPs) during construction. Standard construction BMPs include, but are not limited to:

1. Employ BMPs with regard to erosion and turbidity control. Prior to construction, the construction team should examine all areas of proposed erosion/turbidity control in the field, and make adjustments to the plan specified in the plan control device as warranted by actual field conditions at the time of construction.

2. The contract specifications will prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and will require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. The contractor will be required to prepare a spill prevention plan.
3. Demolition debris would be transported to a landfill or otherwise disposed of in accordance with federal, state, and local requirements. Concrete or paving materials would be disposed of in accordance with federal, state, and local requirements.
4. Inform contractor personnel of the potential presence of threatened and endangered species in the project area, the need for precautionary measures and the Endangered Species Act (ESA) prohibition on taking listed species unless authorized.
5. Any measures or restrictions resulting from **SECTION 7** consultation shall be implemented.
6. The USACE and the SFWMD agree to maintain open and cooperative informal communications with the FWS and the FWC throughout the design, construction, and operation of the project.
7. To protect potential cultural resources, conditions stipulated by the State Historic Preservation Office (SHPO) will be followed. Language will be included in construction contract specifications outlining the steps to be taken in the event that undiscovered historical properties or unmarked human burials are encountered. An informational training session, developed by a professional archaeologist, will be conducted for the contractor's personnel to explain what kinds of archaeological/cultural materials might be encountered during construction of the impoundment, and the steps to be taken in the event these materials are encountered.

#### **4.25.2 Compensatory Wetland Mitigation**

In accordance with the Clean Water Act (CWA) Section 404(b)(1) Guidelines, wetland and aquatic resource impacts are first avoided, then minimized to the maximum extent practicable. Section 404 of the CWA requires compensatory mitigation to replace aquatic resource functions unavoidably lost or adversely affected by authorized activities. The following compensatory mitigation proposal discusses the project's direct and indirect impacts to wetlands and waters of the United States, and proposes a compensatory mitigation plan for the SFWMD's preferred alternative.

##### **4.25.2.1 Direct Impacts**

Construction of the A-2 STA Project will result in permanent direct impacts to 8.4 +/- acres of wetlands, 14.08 +/- acres of agricultural canals and ditches. The STA will alter the elevations of the remaining canals/ditches and wetlands; however, once the STA is operational these features will have wetland characteristics. The only functional loss resulting from the project will be from the fill discharged in 8.4 acres of wetlands from the construction of the levees. The direct wetland impacts result in a loss of 1.68 functional units.

Table 4-13. A-2 STA Functional Loss.

ID	Impact Acreage	FLUCCS	Mit Type	Location (existing)	Location (w/project)	Water (existing)	Water (w/project)	Community Existing	Community (w/project)	Delta (=with curret)	FL
Wetland	8.4	herbaceous	direct	2	0	2	0	2	0	-0.20	-1.68
Ditches/ Canals	14.08	open water	direct	2	0	1	0	1	0	-0.13	-1.88
Total	22.48										-3.56

#### **4.25.2.2 Mitigation for Direct Impacts**

The current mitigation rule, 40 CFR Part 230, Compensatory Mitigation for Losses of Aquatic Resources, Final Rule, focuses on a watershed approach, requiring wetland mitigation to meet the ecological needs of the watershed, use of a functional assessment methodology to offset environmental losses, and protection of wetlands and other aquatic resources that are established as mitigation. The SFWMD proposes to achieve ecological lift by enhancing existing wetlands and waters by removing exotic vegetation.

##### **4.25.2.2.1 Exotic Removal and Vegetation Enhancement**

South Florida's subtropical climate provides an excellent growth environment for the rapid spread of exotic plants that can cause extensive alterations to an area's natural ecosystems. Environmental changes caused by extensive hydroperiod alterations in the project area have been an important factor in the introduction of exotic plant species. Exotic plant species are associated with draining or disrupted fire and hydrologic regimes. Exotic plant invasion can result in partial or total displacement of native plants and loss of wildlife habitat.

With a combination of restored hydrologic regime, and an appropriate exotic vegetation control program for the proposed STA, it is reasonable to expect the remaining 221.6 acres of existing wetlands to approach typical freshwater marsh characteristics, including the plant communities and wildlife. Treatment and maintenance of exotic and invasive vegetation within the STA will be conducted in perpetuity by the SFWMD in accordance with the pending USACE-SFWMD Operations, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) Manual, and every attempt will be made to ensure a minimum of 6 inches of water remains within the STA flow-ways, in order to ensure the wetland vegetation viability.

##### **4.25.2.2.2 Determination of Credits**

The A-2 STA construction will result in permanent direct impacts to 8.4 acres of wetlands and 14.08 acres of agricultural canals and shallow agricultural ditches (combined). The Uniform Mitigation Assessment Methodology (UMAM) was used to assess the effects, both positive and negative, associated with conversion of these impacted Assessment Areas, as well as the ecological lift associated with converting approximately 6,037 acres of active sugarcane into an STA.

As indicated in the Without Project UMAM Scores, the impact areas score relatively low for all three Wetland Function Indicators (Location and Landscape Support, Water Environment, and Community Structure). Although differing by indicator, reasons for the relatively low Without Project UMAM Scores include;

- Lack of connectivity and physical barriers.
- Pumped canals and ditches which can concentrate and/or discharge nutrients, pesticides, and/or herbicides.

- Manipulated water levels and pre-harvest burns.
- Periodic mowing and cleaning of agricultural canals and ditches

As indicated in the With Project UMAM Narratives, all Assessment Areas (AAs) evaluated were anticipated to exhibit increased ecological functions and values in the With Project scenario. Reasons for the improved wetland functions and values include:

- Construction of the A-2 STA will result in 6,500 acres of created or enhanced wetlands.
- Construction of the A-2 STA will remove physical barriers and increase connectivity.
- Construction of the A-2 STA will create habitat for wading birds, fish, and reptiles.
- Construction of the A-2 STA will eliminate the need for fertilizer and most pesticides.
- Construction of the A-2 STA will remove exotic and nuisance vegetation.
- Periodic maintenance of the A-2 STA will ensure proper vegetative cover and maximize nutrient uptake.

As depicted in **Table 4-14** the functional gain associated with Community Structure for conversion of the existing wetlands, canals, and ditches to STA more than offsets the associated functional losses (**Table 4-13**) associated with jurisdictional impacts to the wetlands and Agricultural Canals & Ditches.

Table 4-14. A-2 STA Functional Gain

ID	Total Acreage	FLUCCS	Mit Type	Location (existing)	Location (w/project)	Water (existing)	Water (w/project)	Community Existing	Community (w/project)	Delta (=with curret)	Time Lag	Risk Factor	RFG (=D/(TL*RF))	FG (=RFG*Area)
Wetland	221.6	herbaceous	enhance	2	2	2	2	2	6	0.13	1.03	1.25	0.10	22.95
Total	221.6													22.95

#### 4.25.2.2.3 Performance Standards

The SFWMD will ensure that the enhanced wetlands meet the following performance standards:

1. At least 80 percent cover by appropriate wetland species (i.e., FAC or wetter).
2. Less than 5 percent cover by Category I and II invasive exotic plant species, pursuant to the most current list established by the Florida Exotic Pest Plant Council at <http://www.fleppc.org>, and shall include the nuisance species primrose willow (*Ludwigia peruviana*), dog fennel (*Eupatorium capillifolium*), Bermuda grass (*Cynodon* spp.), Bahia grass (*Paspalum notatum*), and cattail (*Typha* spp.).
3. Hydrologic enhancement will result in soils that are saturated to the surface between 5 and 12.5 percent of the growing season.

#### 4.25.2.2.4 Monitoring Requirements

In order to evaluate the wetland enhancements against the above performance criteria, SFWMD will report annually on the vegetative plant cover, species abundance, and observe changes over time. The A-2 STA onsite wetland enhancement area will be monitored semi-annually for the first three years and annually thereafter for a total monitoring period of 5 years. Monitoring reports shall be submitted annually to the USACE summarizing the mitigation area's progress.

The vegetative community structure that will be created as a result of the construction of A-2 STA project is comprised of emergent and submerged aquatic vegetation cells which will include native plant species such as cattail, sawgrass, bulrush, pickerel weed, duck potato, southern naiad, muskgrass, Illinois pondweed and coontail. The vegetative improvements will provide significant ecological lift as demonstrated through the UMAM community structure scoring process. The wetlands created will be protected from further development, managed to eliminate undesirable vegetation and will provide improved functionality in perpetuity for the system. Monitoring reports shall be submitted annually to the USACE summarizing the wetland vegetation within the various cells.

#### 4.25.2.2.5 Long Term Management Plan

Long-term management of the onsite wetlands and preservation area will be conducted under the SFWMD land management activities. The area will be managed for exotic and nuisance species. The STAs will be managed to maintain appropriate wetland species and improve performance of the treatment areas.

#### 4.25.2.2.6 Adaptive Management

Monitoring will accurately assess the site's performance to facilitate the enhancement of wetland functions and values, and to demonstrate success attainment. An adaptive management approach will be utilized for the STAs so that when problems are detected, enhancement actions, which may include exotic plant removal, supplemental planting, and water management, can be implemented.

#### **4.25.2.3 Cumulative Impacts**

The A-2 STA project features are designed to improve water quality within the downstream areas of the STA. This project along with other CERP projects may cause some adverse consequences to agricultural land use, permanently removing existing acres from agricultural production. These impacts may be felt locally and/or regionally as the economic base derived from agriculture is incrementally reduced relative to other sectors of the economy. With the construction of pump stations, flow-ways, berms, and backfilling canals, there will be some loss of wetlands within the project site. Most of the existing wetlands have been impacted by surrounding agricultural activities, including reduced hydroperiods, ditching, and exotic plant species infestation. Much of these relatively low-functioning wetlands will ultimately be improved through improved water quality thus allowing for an overall higher wetland functional capacity.

#### **4.25.2.4 Secondary Impacts**

There will be no unacceptable adverse secondary impacts to the aquatic ecosystem as a result of the construction of the A-2 STA project. The project design includes erosion control plans, including implementation of Best Management Practices (BMPs). Silt fences will be installed along areas of concern for erosion control and to ensure all sediments remain on site. Floating turbidity barriers will be placed at numerous locations within open water features such as ditches and canals. The SFWMD, or their contractor, may be required to provide a Stormwater Pollution Prevention Plan and submit for coverage under the National Pollution Discharge Elimination System (NPDES) stormwater construction permit. Impacts associated with construction traffic and equipment will be localized due to construction occurring in phases. A monitoring plan will be implemented during and after construction to ensure no adverse impacts to water quality.

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## 5 ENVIRONMENTAL COMPLIANCE & PUBLIC INVOLVEMENT

### 5.1 Public Involvement

#### 5.1.1 Scoping

The SFWMD prepared a feasibility study and environmental documentation report (CEPP PACR) pursuant to Section 203(a)(1) of the WRDA of 1986 (33 U.S.C. 2231(a)(1)), as amended. The SFWMD submitted this report on March 30, 2018 to the ASA(CW) for review in order to determine under 33 U.S.C. 2231(b) whether the study complies with Federal laws and regulations applicable to feasibility studies of water resources development projects.

At that time, the Federal action subject to NEPA was the ASA(CW)'s evaluation of whether the project proposed by SFWMD in the CEPP PACR is feasible and provision of any recommendations concerning the project design or conditions for construction. The Corps prepared a Draft EIS to evaluate and document the potential effects on the quality of the human environment of the SFWMD's Preferred Alternative in its CEPP PACR.

A NEPA scoping letter dated April 16, 2018 was used to invite comments from Federal, State, and local agencies, federally recognized Indian Tribes, and other interested private organizations and individuals. Scoping comments were accepted through May 1, 2018. A Notice of Intent (NOI) to prepare a Draft EIS for the SFWMD Section 203 Preferred Alternative was published in the Federal Register (FR Volume 76, Number 232) on April 16, 2018. All comments received, along with a comment-response matrix are located in **Appendix C – Pertinent Correspondence**.

As documented in a review assessment titled "Review Assessment of South Florida Water Management District's Central Everglades Planning Project, Section 203 Post Authorization Change Re-port, Integrated Feasibility Study and DRAFT Environmental Impact Statement (March 2018, Amended May 2018)," the ASA(CW) determined that SFWMD's recommended plan is feasible from an engineering and construction viewpoint, but identified several technical, policy, and legal concerns. The Review Assessment also stated that completion of the NEPA process, and environmental compliance with applicable water quality requirements, is necessary before the project may proceed to construction.

In Section 1308(a) of WRDA 2018, Congress authorized the project recommended in the addendum to the CEPP PACR "with such modifications as the Secretary considers appropriate," and stated that construction may only occur after the Secretary of the Army addresses the concerns, recommendations, and conditions identified in the Review Assessment. Among other things, the ASA(CW)'s October 26, 2018 Interim Guidance for Comprehensive Everglades Restoration Plan, Central and Southern Florida, Everglades Agricultural Area, Florida directed the Corps to conduct an analysis of the project authorized in Section 1308 of WRDA 2018 "with such modifications as the Secretary considers appropriate," in accordance with the National Environmental Policy Act.

Following the release of the Draft EIS in May 2018, minor design refinements were made to the CEPP PACR Recommended Plan to address the Secretary's concerns, recommendations, and conditions

described in the Review Assessment. This included changes to reduce seepage, manage offsite impacts, and ensure water quality benefits. These refinements did not result in any substantial changes to the project that are relevant to environmental concerns or reveal any significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. Therefore, the Corps, Jacksonville District prepared this Final EIS in accordance with NEPA to evaluate and document effects on the human environment of the CEPP New Water Modification.

The Corps considered a reasonable range of alternatives, including the No Action Alternative, which is the CEPP as authorized in 2016. The CEPP PACR documented SFWMD's consideration of the effects of its proposed activity on the human environment in a manner that was intended to be consistent with NEPA. Therefore, information from the CEPP PACR environmental analysis has been considered by the Corps and, where appropriate, is being utilized for this NEPA preparation.

The SFWMD held six project scoping meetings in both West Palm Beach (4) and Clewiston (2) to engage the public in scoping of key issues to be addressed in development of the alternatives. Notices of the meetings were published in the Florida Administrative Weekly. The scoping meeting and comment period was identified as an open process utilized to define the purpose and need of the action (or project), identify any issues, determine the project point of contact, establish the project schedules and provide recommendations to the agency. A copy of the meeting notices, scoping letters received, and a comment response matrix are located in the **CEPP PACR, Appendix C.3**. A total of 10 public workshops were held between October 23, 2017 and December 22, 2017 to inform the public and obtain public feedback. Because the SFWMD provided several public meetings in accordance with the intent of NEPA and wanting public input on the project, the Corps did not conduct separate NEPA scoping meetings after the notice to prepare a Draft EIS was released by the Corps on April 16, 2018. However, a public notice describing SFWMD's permit application for the construction and operation of the STA was posted on September 5, 2019 for a 30-day comment period. This Final EIS assesses the potential environmental effects on the human environment as they relate to the CEPP New Water Modification authorized in Section 1308(a) of WRDA 2018. In order for the project to comply with NEPA, the Corps, as a Federal agency, has to complete the NEPA documentation to evaluate potential effects on the human environment, consider alternatives, and disclose potential effects to the public.

### 5.1.2 Comments and Responses

A comment response matrix detailing comments received in response to the NEPA scoping letter mailed by the Corps dated April 16, 2018, the draft EIS published on June 8, 2018, and the regulatory public notice posted on September 5, 2019 are located in the Pertinent Correspondence Appendix C. Comments and responses during the SFWMD scoping and planning process are located in the **CEPP PACR (Annex A to this Draft EIS) Appendix C.3**. While not officially noted as cooperating agencies for the purposes of NEPA, the following state and federal agencies were members of the SFWMD led EAA Storage Reservoirs Project Team, and contributed to the development of the Section 203 PACR: U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (USEPA), Florida Fish and Wildlife Conservation Commission (FFWCC), and Florida Department of Environmental Protection (FDEP). These agencies are considered to be partners in CERP projects and had already provided input into the affected environment, environmental effects analysis, and measures to avoid, minimize, and/or mitigate unavoidable impacts.

The Corps determined that sending out NEPA cooperating agency letters was not necessary, because the agencies had already participated in the process and their proposals and analysis had been considered to the maximum extent possible. This meets the intent of 40 CFR 15.01.6.

### **5.1.3 Statement Recipients**

Copies of the NEPA scoping letter and Notice of Availability (NOA) of the Draft and Final EIS were mailed to Federal, State, and local agencies, affected Indian Tribes, and other interested private organizations and individuals. A complete mailing list is available upon request. A copy of the Draft and Final EIS were posted on the Corps Jacksonville District website at the following address, under multiple counties:

<http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch.aspx>

## **5.2 Compliance with Environmental Laws, Statutes and Executive Orders**

**Table 5-1** provides a summary of environmental compliance with each act, E.O., or applicable law.

**Table 5-1. Compliance with Environmental Laws, Regulations, and Executive Orders**

<b>Law, Policy and Regulations</b>	<b>Status of CEPP New Water Modification and Proposed Permit Action</b>	<b>Comments</b>
Anadromous Fish Conservation Act	In compliance with this Act.	The CEPP New Water Modification and proposed permit action would not adversely affect anadromous fish species.
Archaeological Resources Protection Act of 1979	The CEPP New Water Modification and proposed permit action is in compliance with this act and will continue to comply throughout construction and operation.	Further investigations may be needed once PED has started.
American Indian Religious Freedom Act	In compliance with this Act.	The policy of the United States is to protect and preserve for American Indians, Alaska Native Groups and Native Hawaiians, their inherent rights of freedom to believe, express, and exercise traditional religions. These rights include, but are not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremony and traditional rites.
Bald and Golden Eagle Protection Act	In compliance with this Act.	The CEPP New Water Modification would not adversely affect the Bald eagle and will assist to improve forage opportunities for this protected species. No permits for take are required.
Clean Air Act of 1972	In compliance with this Act, any required permits will be obtained prior to implementation of any construction activities.	Potential for permanent sources of air emissions. Air emissions permit may be required for large diesel pumps.
Clean Water Act of 1972	Compliance with this Act will be obtained prior to any construction activities through receipt of Water Quality Certification (WQC) from the State of Florida, as well as a National Pollutant Discharge Elimination System (NPDES) permits or permit modifications. In addition, the SFWMD has applied for a Section 404 permit.	<p>In accordance with the Clean Water Act, a Section 404(b)(1) Evaluation has been completed and is contained within Appendix D. Prior to construction, the Corps and SFWMD will obtain a Comprehensive Everglades Restoration Plan Regulation Act (CERPRA) permit and/or an Environmental Resource Permit (ERP) from the State of Florida, which will constitute certification of compliance with state water quality standards pursuant to Section 401 of the Clean Water Act.</p> <p>SFWMD’s construction and operation of the STA would require a CWA Section 404 Dredge and Fill Permit. A permit application was submitted to USACE on August 6, 2019.</p>

Law, Policy and Regulations	Status of CEPP New Water Modification and Proposed Permit Action	Comments
		Prior to construction, the SFWMD will obtain a NPDES permit for the A2 STA in accordance with Section 402 of the Clean Water Act.
Coastal Barrier Resources Act and Coastal Barrier Improvement Act of 1990	These Acts are not applicable to this project. The official Coastal Barrier Resources System (CBRS) maps were reviewed and the CEPP New Water Modification and Proposed Permit Action does not fall into any designated CBRS areas.	There are no designated coastal barrier resources in the project area that would be affected by this project.
Coastal Zone Management Act of 1972	Through circulation of this final EIS, the Corps will seek concurrence from the Florida State Clearinghouse that the project is consistent to the maximum extent practicable with the enforceable policies of Florida’s approved Coastal Zone Management Program.	A Florida Coastal Zone Management Act Evaluation was prepared in accordance with the provisions of 15 CFR 930 and is located in Appendix B. The Corps determined that the CEPP New Water Modification is consistent to the maximum extent practicable with the enforceable policies of Florida’s approved Coastal Zone Management Program (FCMP). To ensure the project’s continued consistency with the FCMP, concerns identified by the reviewing agencies will be addressed prior to project implementation. The SFWMD will be required to obtain the CERPRA permit from FDEP prior to construction which will demonstrate concurrence with CZMA.
Endangered Species Act of 1973	In compliance with this Act prior to construction.	A Programmatic Section 7 ESA consultation for the Comprehensive Everglades Restoration Plan (CERP) was prepared on March 15, 2013 to evaluate potential effects of CERP on listed species and designated critical habitat under the NMFS’ purview. The Corps provided a Programmatic BA for the CERP to NMFS on July 2, 2013. NMFS provided a Programmatic BO for the CERP to the Corps on December 17, 2013 that included consultation for CEPP. The 2013 Programmatic BO concurred with the determination that CERP, including CEPP is not likely to adversely affect any listed species or their designated critical habitat under NMFS’ purview. The 2013 Programmatic BO also concurred with the “No Effect” determinations made by the Corps in regard to the applicable threatened or endangered species that fell under the purview of NMFS as a result of 2014 CEPP Final PIR/EIS implementation. The CEPP EAA New Water Modifications modified the 2014 CEPP project to further reduce the frequency and volume of high-level freshwater flows from Lake Okeechobee to the Caloosahatchee River Estuary and the St. Lucie Estuary, thus reducing the potential for adverse impacts on

Law, Policy and Regulations	Status of CEPP New Water Modification and Proposed Permit Action	Comments
		<p>estuarine and nearshore biota and providing a minor beneficial effect. The change in footprint due to the EAA Reservoir and STA would have no effect on species under NMFS purview</p> <p>The Corps submitted a Biological Assessment (BA) to the USFWS on May 1, 2018 to comply with formal consultation. The BA included a May Affect, Not Likely to Adversely Affect determination for Audubon’s crested caracara, Everglade snail kite, and wood stork. The Corps also determined that the CEPP New Water Modification May Affect Eastern indigo snake and Florida panther. The Corps later revised the consultation to include the SFWMD as a permit applicant proposing to construct and operate the STA. A Biological Opinion from the FWS is anticipated before the Record of Decision is signed. The Corps will conclude consultation with U.S. Fish and Wildlife Service (FWS) prior to commencement of construction and will continue consultation as appropriate throughout the project’s design and construction phase, as appropriate. Consultation with the National Marine Fisheries Service (NMFS) is complete. Regarding the SFWMD permit application, the Corps determined the STA would not affect Federally listed species under NMFS purview.</p>
Estuary Protection Act of 1968	In compliance with this Act.	The objectives of the CEPP New Water Modification including the proposed permit action are focused on environmental protection. The CEPP New Water Modification provides increased opportunities to redirect water that is currently released to the Caloosahatchee and St. Lucie Estuaries for flood control purposes, allowing for the re-establishment of oyster and sea grass populations that are important for providing water quality and habitat functions within the northern estuaries.
Federal Water Project Recreation Act/Land and Water Conservation Fund Act	In compliance with this Act.	Effects of CEPP New Water Modification and proposed permit action on outdoor recreation have been considered in Section 4. The CEPP New Water Modification and proposed permit action would not adversely affect existing recreational opportunities and additional recreational opportunities will likely be realized.
Fish and Wildlife Coordination Act of 1958, as amended.	In compliance with this Act.	The FWS signed a Memorandum of Agreement on April 23, 2018 to use the NEPA and ESA processes to meet the intent of the Act via their review of the draft EIS. They also participated in the CEPP PACR project planning and did not have any additional comments on the draft EIS. Once the Biological

Law, Policy and Regulations	Status of CEPP New Water Modification and Proposed Permit Action	Comments
		Opinion for the action identified in this EIS is final, this project will be in compliance.
Farmland Protection Policy Act of 1981	The Corps sent the National Resources Conservation Service (NRCS) Form AD 1006 on May 15, 2018 to begin consultation under the Act. The CEPP New Water Modification will be in full compliance with the Act at the time of construction.	Coordination with the U.S. Department of Agriculture (USDA), NRCS will be concluded prior to construction.
Magnuson-Stevens Fishery Conservation and Management Act	In compliance with this Act.	NMFS determined that the EFH provisions in the 2014 CEPP Final PIR/EIS were sufficient and they did not have further comments after they reviewed the draft 2014 CEPP PIR/EIS (2014 CEPP Final PIR/EIS Appendix C.2.2.6 for EFH Assessment). The CEPP New Water Modification would further reduce discharges to the Northern Estuaries, thereby providing potential benefits to EFH. The 2014 CEPP EFH Assessment is hereby incorporated by reference. The CEPP PACR Draft EIS notice of availability was provided to NMFS on June 8, 2018. The additional footprint of the A-2 parcel STA would not have an effect on EFH as it is currently leased for agriculture. In addition, the Corps initiated consultation with NMFS for the proposed permit action through coordination on the public notice of the draft EIS. No additional comments were received from NMFS.
Marine Mammal Protection Act of 1972	The CEPP New Water Modification and proposed permit action are in compliance with this Act.	Project site and adjacent canals lie outside of the areas mapped as being accessible to Manatees, however, the CEPP New Water Modification and proposed permit action will incorporate Standard Manatee Protection Measures to reduce any potential risk to manatees. No impacts to marine mammals are anticipated.
Marine Protection, Research and Sanctuaries Act	This Act is not applicable.	The CEPP New Water Modification does not consider ocean disposal of dredged material.
National Environmental Policy Act of 1969	In progress, the CEPP New Water Modification and proposed permit action will be in full compliance with the Act prior to implementation of any construction activities.	The Corps sent scoping notices and published the NOI in the Federal Register on April 16, 2018. The NOA for review of the draft EIS was released on June 8, 2018 for a 45-day public review period. The NOA for review of the Final EIS is planned to be released on January 24, 2020. The Jacksonville District notes that supplemental NEPA analysis would be required if the Corps or SFWMD makes substantial changes to the proposed action during the project's design phase that are relevant to environmental concerns;

Law, Policy and Regulations	Status of CEPP New Water Modification and Proposed Permit Action	Comments
		<p>however, the Corps does not anticipate such substantial changes. The Corps will prepare two Records of Decision; one for the Civil Works project and one for the regulatory action.</p>
<p>National Historic Preservation Act of 1966 (NHPA)</p>	<p>Will be achieved through a Programmatic Agreement prior to Record of Decision. The CEPP New Water Modification will meet the requirements of this Act throughout construction and operation.</p>	<p>The Corps has decided to comply with Section 106 of the NHPA through the execution and implementation of a Programmatic Agreement, as described in 36 C.F.R. § 800.14(b). Significant cultural resources are known to exist within the vicinity of the project area, specifically within the reservoir footprint. Section 106 of the NHPA allows for a phased approach to compliance with the Act. As part of PED, further investigations and consultation will be needed. Each suite of features will be consulted on as they arise to ensure that the most up to date information will be considered in the subsequent determination of effects. Consultation has been initiated and is ongoing with the Florida SHPO and the appropriate federally recognized tribes pursuant to the Act.</p> <p>A Cultural Resource Assessment Survey for the A-2 Expansion Area and the Corps' determination of no adverse effects on any sites eligible for listing in the National Register of Historic Places provided to the Seminole Tribe of Florida, the Miccosukee Indian Tribe of Florida, and the State Historic Preservation Office on September 17, 2019. The Corps received letters from Florida SHPO and the Seminole Tribe stating they had no objections to the proposed permit action and concurred with our determination.</p>
<p>Native American Graves Protection and Repatriation Act</p>	<p>In compliance with this Act. Neither human remains nor funerary objects were recovered during excavations on Federally owned or managed lands during the course of the CEPP PACR.</p>	<p>NAGPRA applies to Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony as defined in the statute and regulations that are: -in Federal possession or control; or –in the possession or control of any institution or State or local government receiving Federal funds; or –excavated intentionally or discovered inadvertently on Federal or Tribal lands.</p>
<p>Resource Conservation and Recovery Act, as Amended by the Hazardous and Soils Waste Amendments of 1984, CERCLA as Amended by the 5.26.21 Superfund</p>	<p>The SFWMD has completed a limited environmental assessment on the proposed project footprint. Previous and current activities conducted within the proposed project area are in compliance with the referenced acts. The SFWMD will continue to</p>	<p>The SFWMD is responsible for any investigations needed to identify hazardous substances regulated under CERCLA and response costs. Procedures would be implemented by SFWMD during the construction and operation to ensure compliance with the acts' requirements specifically those actives associated with hazardous and toxic chemical documentation, communication, handling, storage, and disposal. In the event that any</p>

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Amendments and Reauthorization Act of 1996, Toxic Substances Control Act of 1976.	meet the requirements of these acts during the construction and operation.	<p>activities or materials that are regulated are discovered during the construction or operation of the project, appropriate actions would be taken.</p> <p>SFWMD has not completed a Phase II environmental site assessment for chemical contamination on the A-2 Expansion lands where the majority of the STA footprint lies. Additional Phase II assessment(s) and required remediation will be conducted by the SFWMD for the A-2 Expansion lands prior to inundation of the STA. Additional information on this is found in Annex H of the CEPP PACR (Annex A of this Final EIS).</p>
Rivers and Harbors Act of 1899	In compliance with this Act.	The CEPP New Water Modification would not obstruct navigation. The SFWMD proposes to install a water control structure in the Miami Canal, a navigable Water of the United States, and withdraw water from and discharge water back into the Miami Canal. The installation of a structure and work that may affect the course, location, control, or capacity of a navigable Water of the United States will therefore, require a Section 10 of the Rivers and Harbors Act of 1899. The SFWMD has submitted an application to the Corps.
Submerged Lands Act	In compliance with the goals of this Act.	The CEPP New Water Modification would reduce freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and will ultimately benefit the ecological habitats that occur on submerged lands of the State of Florida. The CEPP New Water Modification does not occur on submerged lands and no construction is expected on submerged lands.
Wild and Scenic Rivers Act of 1968	This Act is not applicable.	No designated wild and scenic rivers are located within project area.
E.O. 11514, Protection and Enhancement of Environmental Quality, as amended	In compliance with this E.O.	The objectives of the CEPP New Water Modification are focused on environmental protection.
E.O. 11593, Protection and Enhancement of the Cultural Environment	In compliance with this E.O.	The area of potential effect for cultural resources for the CEPP New Water Modification and the proposed permit action includes state and Department of the Interior owned lands only.

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<p>E.O. 11988, Flood Plain Management</p>	<p>In compliance with this E.O.</p>	<p>Purpose of E.O. is to discourage Federally induced development of floodplains. Commitment of lands to restoration precludes such development.</p> <p>1. <i>Determine if the proposed action is in the base flood plain.</i> – Yes, the proposed A-2 reservoir and STA is located in the base flood plain (Zone AE based on FEMA maps, October 2017, <a href="https://maps.co.palm-beach.fl.us/cwgis/?app=floodzones">https://maps.co.palm-beach.fl.us/cwgis/?app=floodzones</a>).</p> <p>2. <i>If the action is in the base flood plain, identify and evaluate practicable alternatives to the action or to location of the action in the base flood plain.</i> – Since the development and authorization of the Comprehensive Everglades Restoration Plan (CERP), reservoir storage in the EAA (Component G) has been an integral part of the plan for restoration of the Everglades ecosystem. For CEPP, as authorized in 2016, the A-2 FEB was determined to be a necessary element of the restoration project. The CEPP PACR’s evaluation of alternatives, which resulted in a change to the A-2 reservoir and STA to provide more storage and treatment for restoration purposes, in virtually the same location as the A-2 FEB, ensured that practicable alternatives to locating the storage and treatment facilities in the flood plain were considered.</p> <p>3. <i>If the action must be in the flood plain, advise the general public in the affected area and obtain their views and comments.</i> – The SFWMD conducted extensive public scoping and outreach efforts during the development of the CEPP PACR. Various configurations for A-2 reservoir storage and STAs in the same general area of the authorized A-2 FEB were considered and presented to the public. See CEPP PACR, Section 7.1 of the main report and Appendix C.3 for details on public involvement efforts.</p> <p>4. <i>Identify beneficial and adverse impacts due to the action and any expected losses of natural and beneficial flood plain values. Where actions proposed to be located outside the base flood plain will affect the base flood plain, impacts resulting from these actions should also be identified.</i> – The proposed modifications to CEPP addressed in the CEPP New Water Modification will further support restoration of the Everglades ecosystem while reducing discharges to the Northern estuaries. The land where the proposed A-2 reservoir and STA would be constructed is agricultural land</p>

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		<p>that has limited natural and beneficial flood plain values. Thus, the proposed changes to CEPP are expected to have little overall effect on natural flood plain values.</p> <p>5. <i>If the action is likely to induce development in the base flood plain, determine if a practicable non-flood plain alternative for the development exists.</i> – The project modifications proposed in the CEPP New Water Modification would be for ecosystem restoration purposes and is not expected to induce development in the base flood plain.</p> <p>6. <i>As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impacts of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the "no action" alternative.</i> – The “no action” alternative would involve construction of the A-2 FEB, as authorized in 2016. The impacts on the flood plain under the “no action” alternative would be similar to those resulting from construction of the A- 2 reservoir and STA. No induced development in the flood plain would be expected as a result of the project modifications proposed in the CEPP New Water Modification. This determination was based on a flood plain analysis conducted for the drainage basin within the EAA that may be subject to altered surface water and groundwater hydrology through construction and operation of the CEPP New Water Modification. The stage response in Lake Okeechobee within the proposed A-2 Reservoir would not significantly alter hydrology within the EAA.</p> <p>7. <i>If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.</i> – The public has been advised of the proposed modifications addressed in this final EIS. Agencies and the public are fully aware that some form of water storage and treatment in the EAA is necessary to achieve the expected Everglades restoration benefits.</p> <p>8. <i>Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order.</i> – The proposed modifications to CEPP to provide additional storage and treatment in the EAA (a) is a practicable alternative to achieve</p>

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		the restoration objective; (b) would not increase flood risks; (c) would not increase the impacts of floods on human safety, health, and welfare; and (d) would restore and preserve the natural and beneficial values of the base flood plain downstream of the proposed A-2 reservoir and STA.
E.O. 11990, Protection of Wetlands	In compliance with this E.O.	Areas proposed for restoration are currently used as agriculture; however, there is one 230-acre wetland within the footprint of the proposed STA. The wetland is a former farm field that was left fallow and has since returned to wetland. Fill will be discharged in portions of the wetland for construction of a berm to separate treatment cells while the remainder of the wetland will be flooded and used for water quality treatment.
E.O. 12962, Recreational Fisheries	In compliance with this E.O.	The CEPP New Water Modification is expected to have a beneficial effect with improvements to recreational fisheries in the Caloosahatchee and St. Lucie estuaries.
E.O. 12898, Environmental Justice	In compliance with this E.O.	The CEPP New Water Modification and proposed permit action do not present any environmental impacts that are high, adverse, and disproportionate to low income, or minority populations. Extensive scoping and public participation ensured potential impacts were understood by the public. No comments were presented as possible environmental impacts that may be disproportionate to low income or minority populations. The 2014 CEPP Final PIR/EIS provided an assessment that is located in Appendix C.2.2 of the 2014 CEPP Final PIR/EIS. No additional effects regarding environmental justice would be expected with the change from the A-2 FEB to a reservoir and converting the A-2 parcel from leased agricultural lands to an STA.
E.O 13007, Indian Sacred Sites	This E.O. is not applicable	This E.O. is directed towards executive branch agencies with statutory or administrative responsibility for the management of Federal lands. The proposed action would not affect Department of Defense owned or USACE-managed lands.
E.O. 13045, Protection of Children From Environmental Health Risks and Safety Risks	In compliance with this E.O.	The CEPP New Water Modification and proposed permit action is not expected to have environmental or safety risks that may disproportionately affect children. All lands are currently publicly owned and would not result in displacement of people or families.

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E.O. 13089, Coral Reef Protection	This E.O. is not applicable	Coral reefs are not affected.
E.O. 13112, Invasive Species	In compliance with this E.O.	A nuisance and exotic vegetation control plan has been prepared to prevent or reduce establishment of invasive and non-native species within the project area. Control plan is located in CEPP PACR Annex G.
E.O. 13175, Consultation and Coordination with Indian Tribal Governments	In compliance with this E.O.	Consultation with the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, and other appropriate federally recognized tribes has been initiated and is ongoing. See Appendix C for correspondence letters. Pursuant to E.O. 13175, the Corps developed the November 01, 2012 Tribal Policy Memorandum, which dictates Federal responsibilities, including Trust Responsibilities, to Federally recognized Tribes.
E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	In compliance with this E.O.	The CEPP New Water Modification and proposed permit action would not adversely affect migratory bird species. The CEPP New Water Modification and proposed permit action is expected to benefit species by improving habitat and increasing availability of foraging opportunities.
Memorandum on Government to Government Regulations with Native American Tribal Governments	In compliance with this Memorandum.	The USACE has consulted with the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, and other appropriate federally recognized tribes (see Appendix C).
Seminole Indian Claims Settlement Act of 1987	In compliance with the Act.	Under this Act, the compact defining the scope of Seminole water rights and their utilization by the tribe shall have the force and effect of Federal law for the purposes of enforcement of the rights and obligations of the tribe.

### 5.3 Compliance With USACE CERP Agricultural Chemical Policy

The Corps Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects (Engineer Regulation (ER) 1165-2-132) directs that Construction of Civil Works projects in HTRW-contaminated areas should be avoided where practicable. In September 2011, the ASA(CW) provided clarification to this HTRW policy for CERP Projects (Memorandum for Deputy Commanding General for Civil and Emergency Operations, Subject: Comprehensive Everglades Restoration Plan (CERP) – Residual Agricultural Chemicals, Dated September 14, 2011). A copy of this policy is included in **CEPP PACR Appendix C.4**. If specific criteria are met, this policy memorandum allows residual agricultural chemicals to remain on project lands and allows the Corps to integrate response actions directly into the construction plan. The SFWMD has requested application of the policy to the A-2 parcel and A-2 Expansion area lands. A copy of the letter from the SFWMD is included in **CEPP PACR Annex H**.

The Agricultural Chemical section of **CEPP PACR Appendix C.2.2** partially fulfills the requirements established in the aforementioned policy for the A-2 parcel and A-2 Expansion area. Pursuant to paragraph 4 of the policy and prior to beginning construction, the Corps will obtain written documentation of regulatory approval(s) for all response actions from the SFWMD, and enter into an agreement with the SFWMD wherein the Corps accepts and expends funds, contributed by the SFWMD, for performance of the approved response action(s).

An estimated 50% of the cultivated lands within the proposed A-2 Expansion area have not been sampled for residual pesticides. However, the SFWMD contractor has reviewed the historic land use to assess potential regional agrochemical impacts on the property. The review includes an evaluation of crop type, soil laboratory analysis, and start-up sampling for the adjacent A-1 FEB currently in operation. Based on the review as compared to the A-2 Expansion area there are three large sections of property that have not been sampled. These parcels were historically used for sugar cane cultivation. These three parcels have historically been leased to a common lessee. Therefore, chemical application on the District leased lands and property leased from private property owners would reasonably have similar residual agrochemical impacts.

The non-Federal sponsor will be 100% responsible for the cost of actions taken due to the presence of residual agricultural chemicals, at no expense to the Federal Government. Any future costs associated with the presence of residual agricultural chemicals at the Federal project site will be 100% non-Federal sponsor cost and responsibility. The costs for characterization of the project lands in preparation for conducting a response action for the residual agricultural chemicals and removal of soils that are hazardous waste will be included as 100% non-Federal sponsor responsibility. The Corps shall not conduct actions to address residual agricultural chemicals for the SFWMD during the operation and maintenance, repair, replacement and rehabilitation (OMRR&R) phase of the project.

### 5.4 Permits, Entitlements and Certifications

The Corps will obtain WQC prior to advertising any construction contract. The SFWMD will obtain WQC prior to construction. Clean Water Act Section 402 NPDES permits may be necessary for the construction (non-point source runoff) of project features depending on means and methods of construction and may

be needed for discharges. The STA requires an NPDES permit because it will convey pollutants into waters of the United States. The SFWMD will obtain an NPDES permit prior to inundation of the STA. This program has been delegated by the U.S. Environmental Protection Agency for implementation to the FDEP. All required permits and/or modifications to existing permits would be acquired prior to construction activities.

## **5.5 Environmental Concerns**

The ASA(CW) reviewed the CEPP PACR to determine whether it complies with Federal law and regulation, to make a determination on the study's feasibility, and to identify any conditions or recommendations. Pursuant to Section 1308(b) of WRDA 2018, prior to the project's construction, the Secretary is required to address the concerns, recommendations, and conditions of the ASA(CW) Review Assessment and those received during the NEPA process, including those related to water supply, planning and policy, water quality, tribal, and engineering listed below.

### **Water Supply**

The public requested additional water supply be identified as part of the CEPP PACR planning process. Additional water supply may be available for agricultural/municipal water supply with the CEPP New Water Modification, but the purpose of the reservoir is environmental restoration and water supply for the environment receives first priority. Slight improvements are documented in the final EIS for water supply to the Lake Okeechobee Service Area.

### **Planning and Policy**

During the 2014 CEPP study process, the Corps and SFWMD considered a reservoir and screened it out early (see 2014 CEPP Final PIR/EIS for details) due to the cost benefit ratio. Subsequently, the SFWMD, under Laws of Florida, Chapter 2017-10, was mandated to evaluate a reservoir CEPP PACR, without screening the alternative for cost.

Various stakeholders raised concerns regarding the siting of the project solely on publically owned lands. The CEPP PACR planning process was restricted with regard to lands under Laws of Florida, Chapter 2017-10, which prohibited the use of eminent domain. The Corps planning process would not include such constraints. Different depths and sizes of reservoirs, STAs, and FEBs have been considered over larger areas and are explained in Section 3. However, ultimately the CEPP PACR used several siting criteria (infrastructure, socio-political and environmental, hydrology, and construction efficiency) that focused on four alternatives using existing state land. Ultimately, there is no assurance that acquisition of private land would be in proximity to current state owned infrastructure, posing risk to increased project costs. Siting lands adjacent to publically owned lands for acquisition would cause detrimental effects to the public through loss of agricultural lands and loss of local tax revenue.

### **Water Quality**

The ASA (CW)'s Review Assessment and the Miccosukee Tribe of Indians of Florida raised concerns related to the projects potential impacts to water quality in the surrounding area. The expected benefits from the

CEPP New Water Modification include improvements on the health of the Caloosahatchee and St. Lucie estuaries due to the reduced potential for freshwater releases from Lake Okeechobee. However, there is a potential for slightly degraded water quality in the Everglades Protection Area resulting from releasing Lake Okeechobee water to WCA 3A if the STA features do not perform as expected. Water quality modeling was used to determine if implementation of the Preferred Alternative would negatively impact water quality, and as with any modeling, there are uncertainties and associated risks. A review of the water quality model used for the CEPP New Water Modification verified that appropriate assumptions were used to simulate phosphorus treatment in the system, and modeling uncertainties were reduced to the maximum extent practicable. Based on these assumptions the WQBEL for water discharged from the A-2 STAs is expected to be achieved. A conservative modeling approach coupled with reasonable assurance measures including NPDES permitting, monitoring, and adaptive management are included as project components designed to reduce risks associated with modeling uncertainty to a tolerable level and provide reasonable assurances that negative impacts to water quality will not occur due to implementation of the CEPP New Water Modification.

Army policy governing water quality improvements and cost-sharing for CERP projects requires that projects meet water quality standards for the current use of the affected water prior to Federal O&M cost-share. SFWMD will be required to demonstrate that all water quality criteria are being attained for water entering the project to receive full operations and maintenance cost-share for water quality benefits.

The water quality cost-share amount for O&M will be calculated based the amount of new water treated by existing state facilities and the new STA. Adjustments to O&M cost-share would occur if monitoring of flows indicates flow volumes exceed or fall short of the projected volume. Changes to O&M cost-share could also occur if modifications to state facilities are required to process the new water. Construction of CEPP New Water Modification project features would be cost-shared 50/50 between the Federal Government and the non-federal sponsor.

### **Tribal**

The Miccosukee Tribe has a Federal Reservation and leased lands within the northern portion of WCA 3A. Due to the proximity of the CEPP New Water Modification to these lands, the Tribe has expressed concerns over the conversion of the FEB to a deep-water storage reservoir south of Lake Okeechobee. In a letter from the Miccosukee Tribe to the SFWMD dated January 8, 2018, the Miccosukee Tribe states that FEBs provide “critical water quality benefits” that a deep reservoir cannot provide. The Miccosukee Tribe expressed concern that discharges from the STA will not meet the Tribal Water Quality Standard of 10 parts per billion (ppb) total phosphorus (TP) or less. The Tribe supports the CERP and the restoration of the Everglades; however, the Tribe believes that Everglades’ restoration should require “more clean water”. The Miccosukee Tribe asserts that the lack of water flow across Tamiami Trail has caused “discriminatory flooding of Tribal lands” and that the CEPP New Water Modification will cause more flooding of polluted water within their reservation and leased lands. The Miccosukee Tribe recommends that the de-compartmentalization of the Everglades through construction of CEPP, the opening of the S-12 gates, and the maintenance of culverts on the L-67 and L-29 levees take priority over construction of the CEPP New Water Modification.

The Corps engaged in government-to-government consultation with the Miccosukee Tribe July 19, 2018, July 15, 2019, and October 25, 2019, to discuss these issues and provide the analysis to address them. Water quality modeling assumptions were reviewed and deemed to be reasonable in meeting the state of Florida's water quality based effluent limit of 13 ppb for STA discharge. In addition, there is an increased phosphorus load associated with increased restoration flows. However, the water will be spread out due to the L-4 levee degrade and Miami Canal backfill, which should allow the system to handle increased loading by reducing oxidation of peat soils and improving wetland vegetation in Northern WCA 3A. Remaining uncertainties in water quality would be addressed through monitoring and adaptive management. A water-quality monitoring plan included in the FEIS Adaptive Management Plan will be used to provide reasonable assurance that water quality will not be negatively impacted by the project. The Corps and SFWMD will establish a technical working group between the Corps, SFWMD, and the Miccosukee and Seminole Tribes to further develop the monitoring plan to characterize the effects of this project and address both Tribes' water quality standards. The Tribe was also briefed on hydrologic modeling and analysis results that indicate the increased water depths are primarily in Northern WCA 3A and are consistent with hydroperiods and water depths needed to restore the ridge and slough and tree island landscape. Central and Southern WCA 3A water depths and durations are not increased to a point that tree islands would be impacted due to the increased ability to move water out of WCA 3A to 3B and then Everglades National Park from the CEPP South features.

### **Engineering**

The Engineering Appendix of the SFWMD CEPP PACR (Annex A) represents a limited level of design, but includes documentation of all engineering assumptions and conceptual designs. Congressional authorization in WRDA 2018 directed the Secretary to address the Review Assessment concerns, recommendations, and conditions. All work has been coordinated and reviewed between the USACE and the SFWMD to ensure that the work meets USACE guidance, standards, and regulations and incorporates, as applicable, SFWMD design guidance.

The following additional analyses were completed to address the ASA(CW) concerns, recommendations, and conditions:

1. 2-dimensional embankment seepage modeling and 3-dimensional groundwater modeling (including model calibration and sensitivity analysis of key design parameters and design assumptions) to verify and/or modify seepage cutoff wall depth for the impoundment, seepage pumping capacity requirements, and seepage collection canal design requirements necessary, and to demonstrate that water table elevations within the project area are maintained to levels which do not impact adjacent landowners;
2. Additional geotechnical data collection and development of the engineering properties of the subsurface materials, including hydraulic conductivity values to support the seepage analysis;
3. Consequence and Potential Failure Mode Analysis, including evaluation of consequences for potential life loss, economic damages, and environmental damages (ER 1110-2-1156 – *Safety of Dams – Policy and Procedures*) and reassessment of embankment filter design;

4. Wind and Wave analysis for the impoundment with flood routing of the Probable Maximum Precipitation (PMP) event (all gated structures are assumed to be inoperable unless designed to do so under extreme conditions) and
5. Detailed Breach Analysis for the impoundment under PMP loading conditions (multiple scenarios to include, at minimum: maximum pool with no spillway discharge; maximum pool with full spillway discharge; and overtopping of the dam).

Following completion of the additional analysis as described above, updated versions of sections A.7, A.8, and A.9 of the CEPP PACR Engineering Appendix were prepared by SFWMD. These revised sections for the Engineering Appendix, which incorporate results from the additional geotechnical data collection to support further technical analysis of seepage, supersede the corresponding sections in the SFWMD CEPP PACR (Annex A of the Draft and Final EIS) that accompanied the Draft EIS. The updated seepage and groundwater modeling analyses for the EAA footprint adjacent to the proposed A-2 Reservoir and A-2 STA, which is detailed within the updated section A.8 and A.9 of the Engineering Appendix, was utilized by SFWMD to develop an addendum to Annex B of the SFWMD CEPP PACR. The addendum to Annex B supplements (but does not supersede) the comprehensive, system-wide Savings Clause analysis contained in Annex B of the SFWMD CEPP PACR by providing further detailed analysis of the methods for managing the anticipated seepage losses from the A-2 Reservoir and A-2 STA. Documentation of the updated engineering analyses cited in this paragraph are listed below and provided in Annex C of the Final EIS:

- CEPP PACR Engineering Appendix (Appendix A of the CEPP PACR), Section A.7 (Replacement Section): “Subsurface Considerations for Construction”
- CEPP PACR Engineering Appendix, Section A.8 (Replacement Section): “Embankment / Dam Design”
- CEPP PACR Engineering Appendix, Section A.9 (Replacement Section): “Reservoir Seepage”
- CEPP PACR Analyses Required for WRDA (Annex B of the CEPP PACR), Addendum to Annex B: “Project Assurances and Savings Clause Summary”

The Recommended Plan has been optimized to address the ASA(CW) concerns, recommendations, and conditions. The changes to the CEPP New Water Modification included the addition of a secondary seepage canal and additional minor design modifications to reduce seepage, manage offsite impacts, and ensure water quality benefits. A Potential Failure Mode Analysis (PFMA) made recommendations to be incorporated during Pre-Construction, Engineering, and Design (PED).

The Corps will ensure compliance with all applicable USACE Engineer Regulations and design standards for dams during PED. Pre-Construction, Engineering and Design (PED) would include additional site-specific surveys and geotechnical investigations. During the PED design phase, detailed analyses would be conducted to prepare construction documents. During PED, project assurances, Savings Clause analysis, and operating manuals would be updated consistent with the implementation phases, as necessary.

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## 6 LIST OF REPORT PREPARERS

This section provides a list of persons involved in the Corps' preparation and review of this National Environmental Policy Act (NEPA) document (**Table 6-1. List of Corps' preparers and reviewers**Table 6-1). The SWFMD performed the plan formulation, held extensive scoping meetings throughout their planning process, and wrote the feasibility study and environmental documentation that was heavily referenced and used within the Draft and Final Environmental Impact Statements (EIS). The SFWMD list of preparers is located in the **CEPP PACR, Section 9, Annex A**.

**Table 6-1. List of Corps' preparers and reviewers for the Final EIS in response to the CEPP PACR**

Name	Role in Document Preparation
Stacie Auvenshine	NEPA Preparation
Amy Thompson	NEPA Preparation
Andy LoSchiavo	NEPA Preparation and Review
Melissa Nasuti	NEPA Review
Angie Dunn	NEPA Preparation and Review
Glenn Landers	NEPA Preparation, Tribal Consultation
Chrissie Figueroa	NEPA Review
Dan Crawford	NEPA Review
Murika Davis	NEPA Review
Brian Dillehay	NEPA Review
Brian Cornwell	NEPA Review
Jim Riley	Water Quality Preparation and Review
Ken Bradshaw	Water Quality Preparation and Review
Ryan Clark	Cultural Resources Preparation, Consultation, and Review

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## 9 GLOSSARY OF ACRONYMS AND TERMS

This section contains the definitions for acronyms and terms used in the Final EIS.

### 9.1 LIST OF ACRONYMS

#### A

ac-ft	acre-feet
AM	Adaptive Management
ASA(CW)	Assistant Secretary of the Army for Civil Works
AWIA	America's Water Infrastructure Act

#### B

BBCW	Biscayne Bay Coastal Wetlands
BCWPA	Broward County Water Preserve Areas
BMAP	Basin Management Action Plan
BMP	Best Management Practices
BO	Biological Opinion

#### C

C&SF	Central and Southern Florida
CBRS	Coastal Barrier Resources System
CE	Caloosahatchee Estuary
CE/ICA	Cost Effectiveness and Incremental Cost Analysis
CEM	Conceptual Ecological Model
CEPP	Central Everglades Planning Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERP	Comprehensive Everglades Restoration Plan
CERPRA	Comprehensive Everglades Restoration Plan Regulation Act

cfs	cubic feet per second
CO <sub>2</sub>	carbon dioxide
COP	Combined Operating Plan
CRE	Caloosahatchee River Estuary
CSSS	Cape Sable seaside sparrow
CWA	Clean Water Act

#### D

Decomp	Decomartmentalization and Sheetflow Enhancement project
DEIS	Draft Environmental Impact Statement
DMSTA	Dynamic Model for Stormwater Treatment Areas
DSAC	Dam Safety Action Classification
DOI	Department of Interior
DPOM	Draft Project Operating Manual
DSAC	Dam Safety Action Classification
DSMS	Dam Safety Modification Study

#### E

EAA	Everglades Agricultural Area
EC	Engineering Circular
ECB	Existing Conditions Baseline
EDC	engineering during construction
EFA	Everglades Forever Act
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice

ENP	Everglades National Park	HQUSACE	USACE Headquarters
E.O.	Executive Order	HTRW	Hazardous, Toxic and Radioactive Waste
EQ	Environmental Quality	HU	habitat unit
ER	Engineering Regulation		
EPA	Everglades Protection Area		
ERTP	Everglades Restoration Transition Plan		
ESA	Endangered Species Act		
EWMA	Everglades Wildlife Management Area		
<b>F</b>			
F.A.C.	Florida Administrative Code	IAR	Incremental Adaptive Restoration
FAR	Florida Administrative Register	IDC	Interest during construction
FB-EC	Florida Bay East Coast	IEPR	Independent External Peer Review
FDEP	Florida Department of Environmental Protection	IG	Interim Goal
FEB	Flow Equalization Basin	IOP	Interim Operations Plan
F.S.	Federal Statute	IR	Indicator Region
FS/DEIS	Feasibility Study/Draft Environmental Impact Statement	IRL	Indian River Lagoon
ft	feet	IRL-S	Indian River Lagoon-South (Project)
FWC	Florida Fish and Wildlife Conservation Commission	IWR	Institute for Water Resources
FWCA	Fish and Wildlife Coordination Act		
FWO	Future Without (Project Condition)		
FY	Fiscal Year		
<b>J</b>			
<b>K</b>			
<b>L</b>			
		LEC	Lower East Coast
		LECSA	Lower East Coast Service Area
		LERR	Lands, Easements, Rights of Way, and Relocations
		LNWR	Loxahatchee National Wildlife Refuge
		LOOPS	Lake Okeechobee Operations Screening
		LORS	Lake Okeechobee Regulation Schedule
		LOSA	Lake Okeechobee Service Area
<b>H</b>			
HHD	Herbert Hoover Dike		

LOWRP Lake Okeechobee Watershed  
Restoration Project

LRR Limited Reevaluation Report

LTGM Long-Term Geometric Mean

**M**

M&I Municipal and Industrial

MCRAM Monte Carlo Reservoir Analysis  
Model

µg/L micrograms per liter

mg/L milligrams per liter

MGD million gallons per day

MISP Master Implementation Sequencing  
Plan

Mo. Month

MOA Memorandum of Agreement

MP Monitoring Plan

MSL Mean Sea Level

MWD Modified Water Deliveries

**N**

NED National Economic Development

NEPA National Environmental Policy Act

NER National Ecosystem Restoration

NESRS Northeast Shark River Slough

NFSL normal full storage (elevation) level

NGVD National Geodetic Vertical Datum

NHPA National Historic Preservation Act

NMFS National Marine Fisheries Service

NNR North New River

NPDES National Pollutant Discharge  
Elimination System

NPS National Park Service

NRHP National Register of Historic Places

NRC National Research Council

NRCS Natural Resources Conservation  
Service

**O**

OIWW Okeechobee Intercoastal Waterway

O&M Operations and Maintenance

OMRR&R Operations, Maintenance, Repair,  
Rehabilitation, and Replacement

OTMP Operational Testing and Monitoring  
Period

**P**

PACR Post Authorization Change Report

PCA Project Cooperation Agreement

PDT Project Delivery Team

PED Preconstruction Engineering and  
Design

PET Potential Evapotranspiration

PIR Project Implementation Report

P.L. Public Law

PM Performance Measure

POR Period of Record

PPA Project Partnership Agreement

ppb parts per billion

PPCA Pre-Partnership Credit Agreement

psu practical salinity unit

PWS Public Water Supply

**Q****R**

RDO Rain Driven Operations

RECOVER	REstoration COordination and VERification	THPO	Tribal Historic Preservation Office(er)
RED	Regional Economic Development	TMDL	Total Maximum Daily Limit
RESOPS	Reservoir Sizing Operations Screening Model	TOC	Technical Oversight Committee
ROM	rough order of magnitude	TP	Total Phosphorus
RPM	reasonable and prudent measure	TSP	Tentatively Selected Plan
RSM	Regional Simulation Model	TTNS	Tamiami Trail Modifications Next Steps
RSM-BN	Regional Simulation Model for Basins		
RSM-GL	Regional Simulation Model for the Glades and Lower East Coast Service Area		
<b>S</b>		<b>U</b>	
S&A	supervision and administration	U.S.	United States
SAD	South Atlantic Division (USACE)	USACE	United States Army Corps of Engineers
SAJ	Jacksonville District (USACE)	U.S.C.	United States Code
SAV	submerged aquatic vegetation	USDA	United States Department of Agriculture
SDCS	South Dade Conveyance System	USEPA	United States Environmental Protection Agency
SFWMD	South Florida Water Management District	USFWS	United States Fish and Wildlife Service
SFWMM	South Florida Water Management Model	USGS	United States Geological Survey
<b>T</b>		<b>V</b>	
SHPO	State Historic Preservation Office(er)	<b>W</b>	
SLE	St. Lucie Estuary	WCA	Water Conservation Area
SLR	Sea Level Rise	WERP	Western Everglades Restoration Project
SMA	Square Mile Area	WIIN Act	Water Infrastructure Investments for the Nation Act of 2016
SPF	Standard Project Flood	WPA	Water Preserve Areas
SRS	Shark River Slough	WPB	West Palm Beach
STA	stormwater treatment area	WQBELS	Water Quality-Based Effluent Limits
<b>T</b>		WQC	Water Quality Certification
TC	terms and conditions		

WRAC Water Resources Advisory Coalition

WRDA Water Resources Development Act

WRRDA Water Resources Reform and  
Development Act

WSE Water Supply and Environmental  
Regulation Schedule

**X**

**Y**

**Z**

## 9.2 GLOSSARY OF TERMS

### A

**Acre** — Area of land equal to 43,560 square feet. In the S.I. metric system, one acre is equal to 4,046.9 square meters or 2.471 hectares.

**Acre-foot** — The quantity of water required to cover 1 acre to a depth of 1 foot. Equal to 43,560 cubic feet (1,233.5 cubic meters).

**Action Plan** — A plan that describes what needs to be done and when it needs to be completed.

**Activity** — A specific project task that requires resources and time to complete.

**Adaptive Management** — A process for learning and incorporating new information into the planning and evaluation phases of the restoration program. This process ensures that the scientific information produced for this effort is converted into products that are continuously used in management decision-making.

**Adverse Effect** — In relation to historic properties, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that will diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

**Adverse Impact** — The detrimental effect of an environmental change relative to desired or baseline conditions.

**Affected Environment** — Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as a result of a proposed human action.

**Air Quality** — Measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

**Aquatic** — Consisting of, relating to or being in water; living or growing in, on or near the water; or taking place in or on the water.

**Aquifer** — An underground geologic formation, a bed or layer of earth, gravel or porous stone, that yields water or in which water can be stored.

**Authorization** — An act by the Congress of the United States, which authorizes use of public funds to carry out a prescribed action.

**B**

**Baseline** — The initial approved plan for schedule, cost or performance management, plus or minus approved changes, to which deviations will be compared as the project proceeds.

**Benthic** — Bottom of rivers, lakes, or oceans; organisms that live on the bottom of water bodies.

**Best Management Practices** — The best available land, industrial and waste management techniques or processes that reduce pollutant loading from land use or industry, or which optimize water use.

**Biological Opinion** — Document issued under the authority of the Endangered Species Act stating the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Services finding as to whether a Federal action is likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of critical habitat.

**Borrow Canal** — Canal or ditches where material excavated is used for earthen construction nearby. Also, typically denotes a canal with no conveyance or water routing purpose.

**C**

**Canal** — A human-made waterway that is used for draining or irrigating land or for navigation by boat.

**Candidate Species** — Plant or animal species not yet officially listed as threatened or endangered, but which is undergoing status review by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

**Central and Southern Florida Project (C&SF)** — A multi-purpose project, first authorized by Congress in 1948, which provides flood control, water supply protection, water quality protection and natural resource protection.

**Channel** — Natural or artificial watercourse, with a definite bed and banks to confine and conduct continuously or periodically flowing water.

**Coastal Ridge** — Area of land bordering the coast whose topography is elevated higher than land further inland.

**Comprehensive Everglades Restoration Plan (CERP)** — The plan for the restoration of the greater Everglades and to meet water supply and flood protection needs in the urban and agricultural regions of south Florida.

**Control Structure** — A human-created structure that regulates the flow of waters or the level of waters.

**Conveyance Capacity** — The rate at which water can be transported by a canal, aqueduct, or ditch. In this document, conveyance capacity is generally measured in cubic feet per second (cfs).

**Cost-Benefit Analysis** — An analysis, often stated as a ratio, used to evaluate a proposed course of action.

**Critical Habitat** — A description, which may be contained in a Biological Opinion, of the specific areas with physical or biological features essential to the conservation of a listed species and which may require special management considerations or protection; these areas have been legally designated via Federal Register notices.

**Cubic feet per second (cfs)** — A measure of the volume rate of water movement. As a rate of streamflow, a cubic foot of water passing a reference section in 1 second of time. One cubic foot per second equals 0.0283 meter /second (7.48 gallons per minute). One cubic foot per second flowing for 24 hours produces approximately 2 acre-feet.

**Cultural Resources** – Encompasses both culturally significant sites and historic properties.

**Culturally Significant Site** – Are geographically defined areas supporting current or past human use such as a community meeting area, spiritual sites, places of worship, medicinal plant gathering areas or cemeteries and burial sites.

**Culvert** — A concrete, metal or plastic pipe that transports water.

## D

**Discharge** — The rate of water movement as volume per unit time, usually expressed as cubic feet per second.

**Dissolved Oxygen (D.O.)** — The concentration of oxygen dissolved in water, sometimes expressed as percent saturation, where saturation is the maximum amount of oxygen that theoretically can be dissolved in water at a given altitude and temperature.

**Dry Season** — Hydrologically, for south Florida, the months associated with a lower incident of rainfall, typically November through May.

**Duration** — The period of time over which a task occurs, in contrast to effort, which is the amount of labor hours a task requires; duration establishes the schedule for a project, and effort establishes the labor costs.

## E

**Ecology** — The science of the relationships between organisms and their environments, also called bionomics; or the relationship between organisms and their environment.

**Ecosystem** — A functional group of animal and plant species that operate in a unique setting that is mostly self-contained.

**Effectiveness** — A measure of the quality of attainment in meeting objectives; this is distinguished from efficiency, which is measured by the volume of output achieved for the input used.

**Endangered Species** — Any species or subspecies of bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion of its range. Federally endangered species are officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service and published in the Federal Register.

**Enhancement** — Measures which develop or improve the quality or quantity of existing conditions or resources beyond a condition or level that would have occurred without an action; i.e., beyond compensation.

**Environmental and Economic Equity (EEE)** — A program-level activity, referred to in early phases of the program as Socioeconomic and Environmental Justice.

**Environmental Consequences** — The impacts to the Affected Environment that are expected from implementation of a given alternative.

**Environmental Impact Statement (EIS)** — An analysis required by the National Environmental Policy Act for all major Federal actions, which evaluates the environmental risks of alternative actions.

**Estuary** — A water passage where the tide meets a river current; an arm of the sea at the lower end of a river.

**Eutrophic** — Referring to a body of water which is naturally or artificially enriched in dissolved nutrients, and often shallow with a seasonal deficiency in dissolved oxygen due to high primary production.

**Evaluate** — To appraise or determine the value of information, options or resources being provided to a project.

**Evaporation** — The change of a substance from the solid or liquid phase to the gaseous (vapor) phase.

**Evapotranspiration** — Evapotranspiration is part of the hydrologic cycle that is a combination of evaporation and transpiration. Solar energy induces evaporation, causing water vapor to condense and fall as precipitation. A portion of the precipitation seeps into the ground and is consumed by plants. It is then recycled back into the atmosphere in the form of transpiration.

**Exotic species** — Introduced species not native to the place where they are found.

## F

**Fallowed Land** — Cultivated land that lies idle during a growing season.

**Feasibility Study** — The second phase of a project. The purpose is to describe and evaluate alternative plans and fully describe recommended project.

**Federally Endangered Species** — An endangered species which is officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service and published in the Federal Register.

**Flood Control Storage Capacity** — Reservoir capacity reserved for the purpose of regulating flood inflows to reduce flood damage downstream [compare with reservoir storage capacity].

**Flow** — The volume of water passing a given point per unit of time.

**Flow Equalization Basin** — Constructed storage feature that is operated between 0 - 4 feet above ground surface used to capture and temporarily store peak stormwater flows

- **Instream Flow Requirements** — Amount of water flowing through a stream course needed to sustain instream values.
- **Minimum Flow** — Lowest flow in a specified period of time.
- **Peak Flow** — Maximum instantaneous flow in a specified period of time.

## G

**Geospatial Data** — Information, which includes, but is not limited to surveys, maps, aerial photography, aerial imagery, and biological, ecological and hydrological modeling coverages.

**Goal** — Something to be achieved. Goals can be established for outcomes (results) or outputs (efforts).

**Groundwater** — Water stored underground in pore spaces between rocks and in other alluvial materials and in fractures of hard rock occurring in the saturated zone.

**Groundwater Level** — Refers to the water level in a well, and is defined as a measure of the hydraulic head in the aquifer system.

**Groundwater Pumping** — Quantity of water extracted from groundwater storage.

**Groundwater Seepage** — Groundwater flow in response to a hydraulic gradient.

**Groundwater Table** — The upper surface of the zone of saturation, except where the surface is formed by an impermeable body.

## H

**Habitat** — Area where a plant or animal lives.

**Hammock** — Localized, thick stands of trees that can grow on natural rises of only a few inches in the land.

**Hectare** — A unit of measure in the metric system equal to 10,000 square meters or 2.47 acres.

**Historic Properties** — Encompasses archaeological, traditional, and built environment resources, including but not limited to buildings, structures, objects, districts and sites over 50 years of age.

**Hydraulic Gradient** — Denotes slope of watercourse, above or below ground water level. Typically, defines energy loss or consumption in the conveyance process.

**Hydraulic Head (Lift)** — Denotes relative comparison of water stages for gravity flow. Pump stations generally provide lift or increase water level elevations.

**Hydrologic Condition** — The state of an area pertaining to the amount and form of water present. For example, saturated ground (water table at surface), lake stage and river flow rate.

**Hydrologic Response** — An observed decrease or increase of water in a particular area.

**Hydrology** — The scientific study of the properties, distribution and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

**Hydropattern** — Refers to depth as well as hydroperiod is hydropattern. Hydropatterns are best understood by a graphic depiction of water level (above as well as below the ground) through annual cycles.

**Hydroperiod** — For non-tidal wetlands, the average annual duration of flooding is called the hydroperiod, which is based only on the presence of surface water and not its depth.

## I

**Impoundment** — An aboveground reservoir used to store water.

**Independent Technical Review Team** — A group autonomous of the Project Team established to conduct reviews to ensure that design products are consistent with established criteria, guidance, procedures, and policies.

**Indicator Species** — Organism, species, or community which indicates presence of certain environmental conditions.

**Invertebrate** — A small animal that does not have a backbone, examples include crayfish, insects and mollusks, which can be indicators of ecosystem status.

## J

## K

## L

**Lag** — The amount of time after one task is started or completed before the next task can be started or completed.

**Land Classification** — An economic classification of variations in land reflecting its ability to sustain long-term agricultural production.

**Levee** — A human-created embankment that controls or confines water.

**Littoral Zone** — The shore of land surrounding a water body that is characterized by periodic inundation or partial saturation by water level. Typically defined by species of vegetation found.

**Local Sponsor** — The South Florida Water Management District.

## M

**Macrophytes** — Visible plants found in aquatic environments, including sawgrass, sedges and lilies.

**Marl** — Soils comprised of clays, carbonates, and shell remains.

**Marsh** — An area of low-lying wetland.

**Master Program Management Plan (MPMP)** — A document which describes the framework and processes to be used by the USACE and the SFWMD for managing and monitoring implementation of the Comprehensive Everglades Restoration Plan.

**Mercury** — Heavy metal that is toxic to most organisms when converted into a byproduct of inorganic-organic reaction. Distributed into the environment mostly as residual particles from industrial processes.

**Mitigation** — To make less severe; to alleviate, diminish or lessen; one or all of the following may comprise mitigation: (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating or restoring the affected environment; (4) reducing or eliminating an impact over time by preservation and maintenance operations during the life of an action; and (5) compensating for an impact by replacing or providing substitute resources or environments.

**Model** — A tool used to mathematically represent a process which could be based upon empirical or mathematical functions. Models can be computer programs, spreadsheets, or statistical analyses.

**Monitoring** — The capture, analysis and reporting of project performance, usually as compared to plan.

**Multi-purpose project** — A project offering environmental benefits and other water related needs.

**Muck lands** — Fertile soil containing putrid vegetative matter.

## N

**National Economic Development (NED)** — Corps of Engineers benefit evaluation process used to justify Recreation expenditures.

**No Action Alternative** — The planning process by which the action agency decides to not carry forth any planned action to alter existing conditions.

**O**

**Objective** — A goal expressed in specific, directly measurable terms.

**Off-peak** — Less than peak design flow rate during storm runoff producing events.

**Operation, Maintenance, Repair, Rehabilitation, Replacement (OMRR&R)** — 100% local sponsor responsibility to OMRR&R recreation facilities and amenities.

**Outreach** — Proactive communication and productive involvement with the public to best meet the water resource needs of south Florida.

**Oxygen Demand** — The biological or chemical demand of dissolved oxygen in water. Required by biological processes for respiration.

**P**

**Peat** — Soil rich in humus or organic (exerts of oxygen demand) and is highly porous.

**Performance Measure** — A desired result stated in quantifiable terms to allow for an assessment of how well the desired result has been achieved.

**Periphyton** — The biological community of microscopic plants and animals attached to surfaces in aquatic environments, for example algae.

**Phosphorus (P)** — Element or nutrient required for energy production in living organisms. Distributed into the environment mostly as phosphates by agricultural runoff (fertilizer) and life cycles. Frequently the limiting factor for growth of microbes and plants in south Florida.

**Programmatic Regulations** — Section 601(h) of WRDA 2000 states that the overarching purpose of the Comprehensive Plan is the restoration, preservation and protection of the south Florida ecosystem while providing for the other water related needs of the region, including water supply and flood protection. The purpose of the regulations is to ensure that the goals and objectives of CERP are achieved. The regulations will contain: (1) processes for the development of Project Implementation Reports, Project Cooperation Agreements and operating manuals that ensure the goals and objectives of the plan are achieved; (2) processes that ensure new scientific, technical, or other information such as that developed through adaptive management is integrated into the implementation of the plan; and (3) processes to establish interim goals to provide a means by which the restoration success of the plan may be evaluated throughout the implementation process.

**Project** — A sequence of tasks with a beginning and an end that uses time and resources to produce specific results. Each project has a specific, desired outcome, a deadline or target completion date and a budget that limits the amount of resources that can be used to complete the project.

**Project Partnership Agreement (PPA)** — A document that describes the roles and responsibilities of the USACE and SFWMD for real estate acquisition, construction, construction management and operations and maintenance.

**Project Delivery Team** — An interdisciplinary group formed from the resources of the implementing agencies, which develops the products necessary to deliver the project.

**Project Duration** — The time it takes to complete an entire project from starting the first task to finishing the last task.

**Project Implementation Report (PIR)** — A decision document that will bridge the gap between the conceptual design contained in the Comprehensive Plan and the detailed design necessary to proceed to construction.

**Proposed Action** — Plan that a Federal agency intends to implement or undertake and which is the subject of an environmental analysis. Usually, but not always, the proposed action is the agency's preferred alternative for a project. The proposed action and all reasonable alternatives are evaluated against the no action alternative.

**Public Involvement** — Process of obtaining citizen input into each stage of the development of planning documents. Required as a major input into any EIS.

**Public Outreach** — A program-level activity with the objectives of keeping the public informed of the status of the overall program and key issues associated with restoration implementation and providing effective mechanisms for public participation in the restoration plan development.

**Pump Station** — A human constructed structure that uses pumps to transfer water from one location to another.

## Q

**Quality Assurance (QA)** — The process of evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

**Quality Control (QC)** — The process of monitoring specific project results to determine if they comply with relevant quality standards, and identifying means of eliminating causes of unsatisfactory performance.

## R

**Recharge** — The processes of water filling the voids in an aquifer, which causes the piezometric head or water table to rise in elevation.

**Record of Decision** — Concise, public, legal document which identifies and publicly and officially discloses the responsible official's decision on the alternative selected for implementation. It is prepared following completion of an Environmental Impact Statement.

**Regional Water Supply Plan** — Detailed water supply plan developed by the District under Ch. 373.0361, F.S.

**Reservoir** — Artificially impounded body of water.

**Reservoir Storage Capacity** — Reservoir capacity normally usable for storage and regulation of reservoir inflows to meet established reservoir operating requirements.

**Flood Control Storage Capacity** — Reservoir capacity reserved for the purpose of regulating flood inflows to reduce flood damage downstream.

**Restoration** — The recovery of a natural system’s vitality and biological and hydrological integrity to the extent that the health and ecological functions are self-sustaining over time.

**Restoration Coordination and Verification (RECOVER)** — A program-level activity whose role is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of the Comprehensive Everglades Restoration Plan.

**Restudy** — The Central and South Florida Project Comprehensive Review Study, authorized by the Water Resources Development Act of 1992, which examined the Central and Southern Project to determine the feasibility of modifying the project to restore the south Florida ecosystem and provide for other water-related needs of the region, and which resulted in The Final Integrated Feasibility Report and Programmatic Environmental Impact Statement, which was transmitted to Congress on July 1, 1999.

**Risk Analysis** — An evaluation of the feasibility or probability that the outcome of a project or policy will be the desired one; usually conducted to compare alternative scenarios, action plans or policies.

## S

**Scoping** — The process of defining the scope of a study, primarily with respect to the issues, geographic area, and alternatives to be considered. The term is typically used in association with environmental documents prepared under the National Environmental Policy Act.

**Scrub** — A community dominated by pinewoods with a thick understory of oaks and saw palmetto, and which occupies well-drained, nutrient-poor sandy soils.

**Seepage** — Water that escapes control through levees, canals or other holding or conveyance systems.

**Sheet Flow** — Water movement as a broad front with shallow, uniform depth.

**Slough** — A depression associated with swamps and marshlands as part of a bayou, inlet or backwater; contains areas of slightly deeper water and a slow current; can be thought of as the broad, shallow rivers of the Everglades.

**South Florida Ecosystem** — An area consisting of the lands and waters within the boundary of the South Florida Water Management District, including the Everglades, the Florida Keys and the contiguous near-shore coastal waters of South Florida.

**Spatial Extent** — Area that is continuous without non-integrating internal barriers or land usage.

**Spillway** — Overflow structure of a dam.

**Stakeholders** — People or organizations having a personal or enterprise interest in the results of a project, who may or may not be involved in completing the actual work on that project.

**Stormwater** — Surface water resulting from rainfall that does not percolate into the ground or evaporate.

**Stormwater Treatment Area** — Constructed freshwater wetland which uses emergent and/or submergent aquatic vegetation in the removal of nutrients from stormwater.

**Subsidence** — A local mass movement that principally involves the gradual downward settling or sinking of the earth's surface with little or no horizontal motion. It may be due to natural geologic processes or mass activity such as removal of subsurface solids, liquids, or gases, ground water extraction, and wetting of some types of moisture-deficient loose or porous deposits.

**Surficial Aquifer** — An aquifer that is closest to the surface and is unconfined; the water level of a surficial aquifer is typically associated with the groundwater table of an area.

**Sustainability** — The state of having met the needs of the present without endangering the ability of future generations to be able to meet their own needs.

**Swamp** — A generally wet, wooded area where standing water occurs for at least part of the year.

## T

**Threatened species** — Legal status afforded to plant or animal species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range, as determined by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

**Tiering** — Procedure which allows an agency to avoid duplication of paperwork through incorporation by reference of the general discussions and relevant specific discussions from an environmental impact statement (EIS) of broader scope into a subsequent EIS of narrower scope.

**Trade-Off** — Allowing one aspect of a project to change, usually for the worse, in return for another aspect of the project getting better.

**Tributary** — A stream feeding into a larger stream, canal or waterbody.

## U

## V

## W

**Water Budget** — An account of all water inflows, outflows, and change in storage for a pre-specified period of time.

**Water Conservation Areas (WCAs)** — Marshland areas that were designed for use as storage to prevent flooding, to irrigate agriculture and recharge well fields and as input for agricultural and urban runoff; the Water Conservation Areas WCA-1, WCA-2A, WCA-2B, WCA-3A, and WCA-3B comprise five surface water management basins in the Everglades; bounded by the Everglades Agricultural Area on the north and the Everglades National Park basin on the south, the WCAs are confined by levees and water control structures that regulate the inflows and outflows to each one of them.

**Watershed** — A region or area bounded peripherally by a water parting and draining ultimately to a particular watercourse or body of water.

**Wetlands** — Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

**Wet Season** — Hydrologically, for south Florida, the months associated with a higher than average incident of rainfall, June through October.

**Wildlife Corridor** — A relatively wide pathway used by animals to transverse from one habitat arena to another.

**Wildlife Habitat** — An area that provides a water supply and vegetative habitat for wildlife.

## X

## Y

## Z

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