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**South Florida Water Management District Section
203 Everglades Agricultural Area Southern
Reservoir and Stormwater Treatment Area
Draft Environmental Impact Statement**

June 2018



**US Army Corps
of Engineers®**

Cover Sheet
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Central Everglades Planning Project
SOUTH FLORIDA WATER MANAGEMENT DISTRICT SECTION 203 EVERGLADES AGRICULTURAL
AREA SOUTHERN RESERVOIR AND STORMWATER TREATMENT AREA (CENTRAL EVERGLADES
PLANNING PROJECT POST AUTHORIZATION CHANGE REPORT)
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:

The purpose of the South Florida Water Management District's Section 203 Study 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 authorized Central Everglades Planning Project. The SFWMD Preferred Alternative, or Recommended Plan, would change the authorized Central Everglades Planning Project to achieve these benefits by reducing the large pulses of regulatory flood control releases sent from Lake Okeechobee by redirecting approximately 360,000 acre-feet of water on an average annual basis south through the Greater Everglades. Components of the Recommended Plan include an above ground storage reservoir, stormwater treatment area and increased canal conveyance within the Miami and North New River canal. The Recommended Plan will 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.

Send your comments by:
July 24th, 2018

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EXECUTIVE SUMMARY

PURPOSE AND NEED

The South Florida Water Management District (SFWMD) prepared a feasibility study and environmental documentation (study) pursuant to Section 203(a)(1) of the Water Resources Development Act (WRDA) of 1986 (33 U.S.C. 2231(a)(1)), as amended. The SFWMD submitted this study, called the Central Everglades Planning Project (CEPP) Post Authorization Change Report (PACR) on March 30, 2018 to the Assistant Secretary of the Army for Civil Works (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. This SFWMD study, if approved, would be a Post Authorization Change Report (PACR) to modify the Central Everglades Planning Project (CEPP), which was authorized as a Federal project by Congress in 2016. The SFWMD request modifies CEPP features specific to the New Water Project Partnership Agreement (New Water PPA). The SFWMD study was made available to the public on their website at <https://www.sfwmd.gov/our-work/cepp-project-planning/eea-reservoir>. This Draft Environmental Impact Statement will refer to the CEPP PACR as the SFWMD Section 203 Report.

The Federal action of the ASA(CW) is to evaluate and report whether the project is feasible and provide any recommendations concerning the project design or conditions for construction to several congressional committees. Under Section 203 guidance, the U.S. Army Corps of Engineers (Corps) is not involved in a non-federal interest's process of the development of alternatives but may provide technical assistance at the non-federal interest's expense (in this case SFWMD is the non-Federal Interest). The National Environmental Policy Act (NEPA) applies to the federal action in response to the submittal of the feasibility study. Therefore, the Corps has prepared this Environmental Impact Statement (EIS) in accordance with NEPA to evaluate and document effects on the human environment of the SFWMD Preferred Alternative prepared under Section 203 in relation to the No Action Alternative, which is the authorized 2014 CEPP features. The SFWMD's study has documented their consideration of the effects of their proposed activity on the human environment in a manner that was intended to be consistent with NEPA. Therefore, information from the SFWMD environmental analysis has been utilized for this NEPA preparation.

AUTHORITY

CEPP was authorized by Congress in the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, which includes the Water Resources Development Act (WRDA) of 2016 as Title I. 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. The Final CEPP integrated project implementation report (PIR) and EIS, 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. The Final CEPP PIR/EIS 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. In response to Florida Law Chapter 2017-10 providing direction to SFWMD with regard to expedited planning, design, and construction of improved conveyance, water storage and

treatment in the EAA with a reservoir holding a minimum of 240,000 acre-feet, SFWMD developed recommended changes to CEPP in the Section 203 Study, which requires Congressional authorization.

The SFWMD Section 203 Study also reaffirms that the authorized CEPP project features (the PPAs are described further in the **SFWMD Section 203 Report Executive Summary, Annex A and in Table ES-1 below**), are able to accommodate additional freshwater flows to the central Everglades that would result from additional canal conveyance, storage, and treatment wetlands proposed on lands within the Everglades Agricultural Area (EAA). These additional flows are delivered with a timing shift that favor dry season flows in addition to CEPP when downstream infrastructure has adequate capacity to convey the flow. The Recommended Plan builds upon the CEPP and achieves the final increments of the required storage in the Everglades Agricultural Area (Component G) and freshwater flows to Northwest and Central WCA3A (Component II), providing the remaining one-third of the restoration flow goal identified in CERP and in CEPP.

Table ES-1. Description of Features within 2014 CEPP Project Partnership Agreements (PPAs)

PPA North	
L-6 Diversion	
S-8 Pump Modifications	
L-4 Levee Degrade and Pump Station	
L-5 Canal Improvements	
Miami Canal Backfill	
PPA South	
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 ¹
L-67 A Spoil Mound Removal	
PPA New Water	
Seepage Barrier L-31 N	
A-2 Reservoir and Stormwater Treatment Area	
Miami Canal and North New River Canal Conveyance Improvements	

¹ 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 for CEPP and within the SFWMD Section 203 Study; and project-specific objectives and constraints were established to evaluate the plans. In general, ecosystem restoration objectives focused on capturing freshwater discharges 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 Draft 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 SFWMD Section 203 study 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 PPA North and PPA 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, above-ground 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. The CEPP PPA North and PPA 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 and determined to be robust enough in the 2014 CEPP design to accommodate the additional timing shifts and flow volumes that would be delivered by the SFWMD Section 203 Preferred Alternative.

Management measures were compiled from previous CERP components, measures identified during the 2014 CEPP planning efforts, and new measures that were identified are consistent with study objectives. The primary factors considered by SFWMD for screening out management measures were: 1) direction from Congress in relation to the 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 concerns.

These aforementioned considerations were addressed in the SFWMD Section 203 Report (CEPP PACR) using 16 criteria in its siting analysis on locating storage and treatment features. The criteria are grouped into the four general categories of (1) existing infrastructure, (2) socio-political and environmental, (3) hydrology, and (4) construction and operations efficiency. Only one of the criteria addressed eminent domain authority. The siting analysis resulted in a unique ability to optimize project construction and operations to reduce the need for additional conveyance, capital construction and land acquisition costs. 1) if the measures did not sufficiently address project objectives; 2) if land was not in public ownership or was unavailable for public acquisition; or 3) if the management measure would result in unacceptable environmental impacts. Although the Corp would not have constrained our analysis to publically owned lands, Senate Bill 10 explicitly mandated that the SFWMD utilize publically-owned lands.

Six alternative configurations (**Figure ES-1**) were evaluated against the 2014 CEPP Authorized Plan (No Action) using three hydrologic simulation model outputs, including an alternative for multi-purpose (environmental restoration and other related needs, as described in component G of the CERP) use of the storage reservoir. The same performance measures that were used to evaluate 2014 CEPP were also used to evaluate and compare alternatives under the SFWMD Section 203 study to the degree to which proposed alternative plans met CERP goals and restoration targets. The Final Array of Alternatives in the SFWMD Section 203 Report included five alternative scenarios, with an additional alternative that included operations. However, two of the alternatives included operational components that are not pictured in the graphic below. The SFWMD Section 203 Preferred Alternative included optimization of operations within the R240A Alternative. This is further described in Chapter 3 of this Draft EIS. The Draft EIS considers six alternatives, with the operational alternative, C240A, as the Preferred Alternative.

To quantify the potential water available under each alternative considered, a future without (FWO) project condition baseline scenario was evaluated with hydrologic modeling tools to identify water discharged from Lake Okeechobee in excess of defined target flows for the Northern Estuaries. Over 500,000 ac-ft of excess water is discharged to the Northern Estuaries on an average annual basis under the 2008 Lake Okeechobee Regulation Schedule (LORS). The SFWMD Section 203 plan formulation strategy included development of scenarios to redirect this excess water, subject to the project objectives and constraints, and evaluated the number of high flow events to the Northern Estuaries that can be eliminated by implementing conveyance improvements, a storage reservoir and water quality treatment facilities for flows south.

The project lands are located between and adjacent to the North New River and Miami canals. This location utilizes existing conveyance features (which if the project was to be authorized would need to be improved) to move water from Lake Okeechobee to the project components and the WCAs. The project lands are adjacent, or in close proximity, to existing water quality treatment facilities (Stormwater Treatment Area [STA] 3/4 and STA 2) that are currently being used by SFWMD for environmental purposes. These facilities were also included for use within in the 2014 CEPP Recommended Plan and the location of the project lands create a unique opportunity to optimize operations.

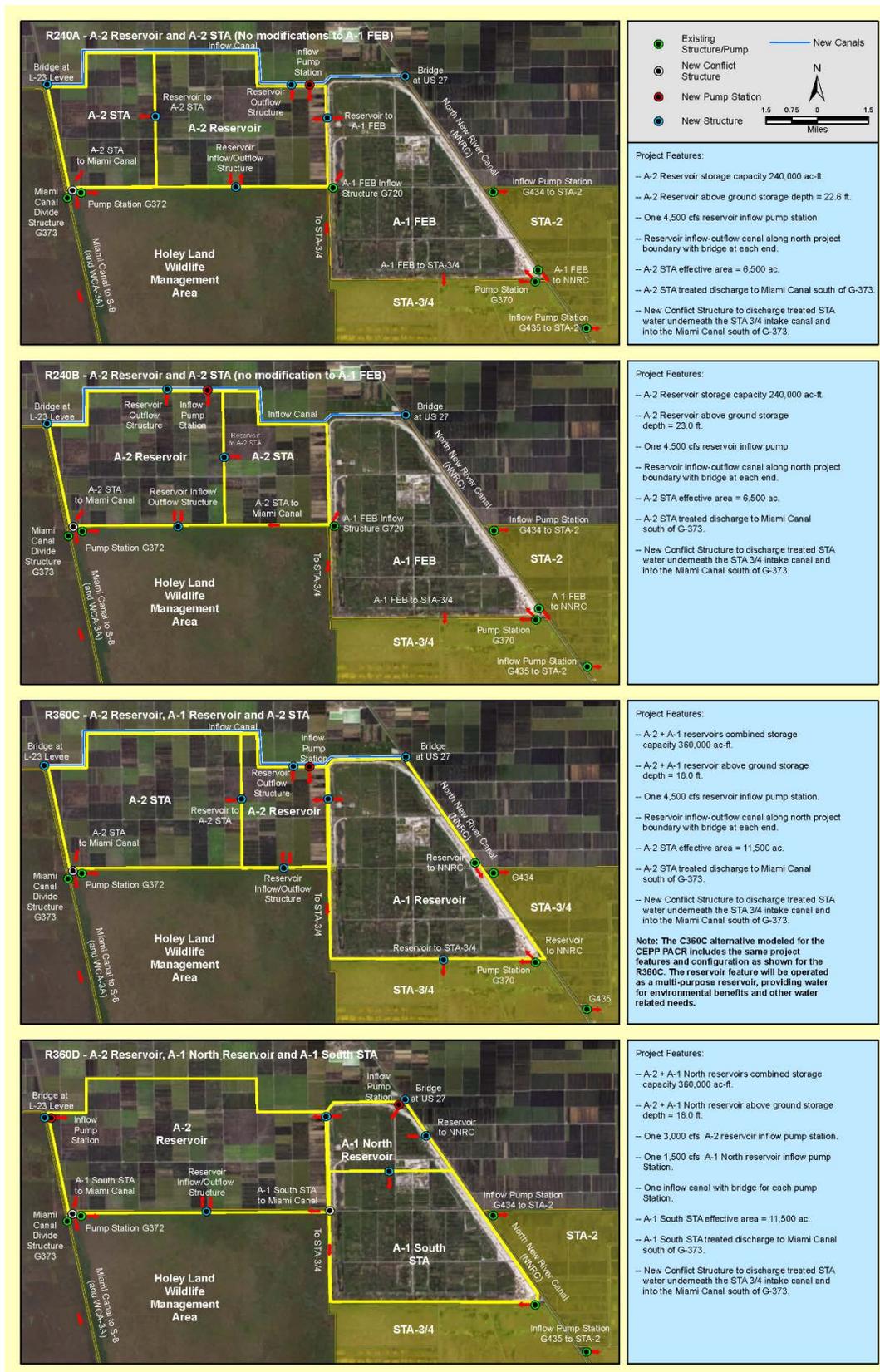


Figure ES-1. SFWMD Section 203 Alternatives

BENEFITS OF THE PREFERRED ALTERNATIVE

The SFWMD Preferred Alternative (C240A) is the Recommended Plan under NEPA for purposes of this Draft EIS and includes a 240,000 ac-ft reservoir (10,500 acres) with multi-purpose operational flexibility, 6,500-acre STA, 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.

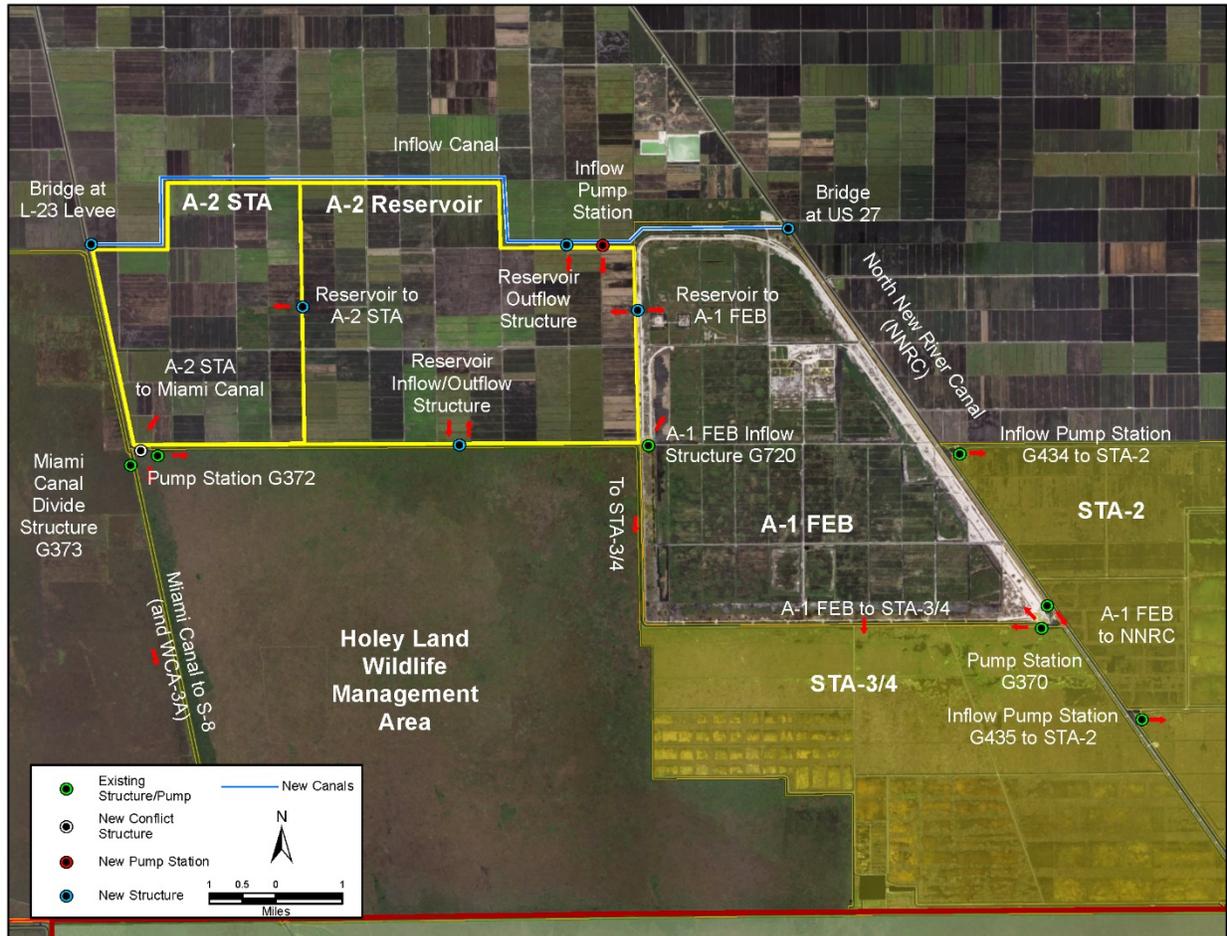


Figure ES-1. SFWMD Section 203 Preferred Alternative

High-flow discharges lasting more than 60 days in the Caloosahatchee Estuary or more than 42 days in the St. Lucie Estuary have been found to be particularly damaging to the oyster populations. The Recommended Plan would reduce high-flow discharge events to the Northern Estuaries lasting more than 60 days to the Caloosahatchee Estuary by 40% and would provide a 55% reduction in high-flow discharge events lasting more than 42 days in the St. Lucie Estuary. These reductions are in addition to the benefits provided by the previously authorized CERP projects, including the 2014 CEPP Recommended Plan, Canal 43 Reservoir Project and Canal 44 Reservoir Project.

The Recommended Plan reduces the number, return frequency and severity of undesirable, high-volume discharges from Lake Okeechobee in the Northern Estuaries, thus improving salinity and water quality conditions in the both the St. Lucie and Caloosahatchee estuaries. Improvements to the overall health of the Northern Estuaries would have a direct improvement on the economies of these regions through increases in waterfront property values, tourism, recreation, marine, and other industries. In combination

with the previously authorized CERP projects, the Recommended Plan approaches the CERP goal of approximately 80% reduction in damaging discharges to the Northern Estuaries, by providing a 55% reduction in discharge volumes and a 63% reduction in mean monthly high-flow discharge events to the Northern Estuaries from Lake Okeechobee. Salinity conditions in the estuaries would also be improved by reducing the number of Lake Okeechobee events that exceed the preferred salinity envelope by 45% in the Caloosahatchee Estuary and 39% in the St. Lucie Estuary.

In addition to reducing discharges to the Northern Estuaries, the SFWMD Section 203 Preferred Alternative would increase CEPP flows to the central portion of the Everglades from an average of approximately 210,000 ac-ft to 370,000 ac-ft annually. This additional freshwater flow to the central Everglades is essential to Everglades Restoration and assists to achieve the CERP goal.

The additional water flowing into northern WCA 3A and ENP provided by the Recommended Plan would help to restore vegetative communities and improve habitat for fish and wildlife. The increases in flow also provide additional improvement of natural processes critical for the development of peat soils and tree islands, which are essential features of the Everglades ridge and slough landscape. Additional overland flows and operational refinements in the South Dade system would also improve salinity conditions in Florida Bay.

The Recommended Plan also boosts resiliency to potential sea level rise by increasing freshwater in the Everglades and buffering natural system areas and the underlying aquifer against possible sea level rise and changes in rainfall. Although the magnitude of the effects of rising sea levels, temperature changes, and changing rainfall patterns is uncertain, it is generally acknowledged that sea level rise will affect both natural system and human environmental conditions in south Florida during the next century. Although the CERP was formulated in 1999 to address declining conditions in the Greater Everglades ecosystem and restoration of ecological functions without the benefit of the current level of understanding about possible climate change effects and the associated effects on sea level rise, scientists and agency water managers agree that implementation of CERP will provide an important adaptation response for both the natural system and the human environment considering future sea level rise scenarios. For CEPP, Annex I of the 2014 CEPP PIR/EIS evaluated the effects of sea level rise. As the mean tide level increases, the additional water from CEPP will provide a buffer of freshwater that will limit salinity related impacts to freshwater wetland vegetation, reduce peat soil degradation, and impede saltwater intrusion into the groundwater aquifer. The effects of sea level change were analyzed per Engineering Circular 1165-2-212. This analysis looked at the effect of sea level change on the benefits predicted for the CEPP authorized plan. The results indicate that within a 50-year planning horizon the average annual net project benefits are likely to be reduced by less than 8% 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 that would occur under the FWO condition. As the Recommended Plan increases average annual flow by approximately 160,000 ac-ft above the 2014 CEPP, it is anticipated that average annual net project benefits would be reduced by even less than 8% over the 50-year planning horizon.

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) April 16, 2018. Additional public meetings will be held with the release of this draft NEPA document.

ENVIRONMENTAL CONCERNS AND AREAS OF CONTROVERSY

The Assistant Secretary of the Army for Civil Works (ASA(CW)) will review the SFWMD recommended plan to determine whether the SFWMD complies with Federal law and regulation, to make a determination on the study's feasibility, and to identify any conditions or recommendations. If the ASA(CW) determines that the SFWMD recommended plan is feasible, further engineering analysis of the SFWMD recommended plan will be required prior to or during the early activities of Pre-Construction, Engineering, and Design (PED) Phase to ensure compliance, including Engineering Regulation 1110-2-1156 and the CERP Design Criteria Memoranda (DCM).

- Additional water supply may be available for agricultural/municipal water supply with the SFWMD Preferred Alternative, 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 Report for details) due to the cost benefit ratio. Subsequently, the SFWMD, under Laws of Florida, Chapter 2017-10, was mandated to evaluate a reservoir in their Section 203 study, without screening the alternative for cost.
- The SFWMD Section 203 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.
- During the PED phase, all appropriate RECOVER level reviews, would be completed consistent with the implementation phases, as necessary.

Water Quality

- The expected benefits from the Recommended Plan include improvements on the health of the Caloosahatchee and St. Lucie estuaries due to the reduced potential for undesirable discharges from Lake Okeechobee. However, there is a potential for slightly degraded water quality conditions in the new Lake Okeechobee water that would be discharged to WCA 3A if the STA features are undersized. A sensitivity model run regarding settling rates would need to be performed, with a settling rate of zero, for the reservoirs to ensure water quality standards would be achieved.
- STA bypasses should be avoided and further design may be required to meet water quality standards.

Tribal

- The Miccosukee Tribe have a Federal Reservation and leased lands within the northern portion of WCA 3A. Due to the proximity of the Recommended Plan 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 Standards of 10 parts per billion 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 Recommended Plan 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 Recommended Plan.

Engineering

The Engineering Appendix of the SFWMD report represents a limited level of design, but includes documentation of all engineering assumptions and conceptual designs. PED for CEPP features, as modified by the SFWMD recommended plan, could begin after Congressional authorization contingent upon ASA(CW) concurrence with the report and upon SFWMD’s concurrence consistent with the implementation phases. All work would be coordinated and reviewed between the USACE and the SFWMD, and approved by the USACE and SFWMD prior to construction, to ensure that the work meets USACE guidance, standards and regulations and incorporates, as applicable, SFWMD design guidance. PED would include 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. The results of these analyses during PED may result in design modifications and/or revisions to the project total cost.

The USACE will ensure compliance with all applicable USACE Engineering Regulations and design standards for dams prior to final approval of the impoundment design and prior to initiating construction. The following additional analyses are required to be conducted prior to or during early activities of the PED Phase in support of the engineering design:

- (1) 2-dimensional embankment seepage calculations 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 along with updated slope stability analyses;

- (3) Consequence and Potential Failure Mode Analysis, including evaluation of consequences for potential life loss, economic damages, and environmental damages (ER 1110-2-1156) 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.

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1.0 INTRODUCTION

The purpose of this Draft Environmental Impact Statement (EIS) is to evaluate potential effects on the human environment as they relate to the South Florida Water Management District's (SFWMD) Section 203 Preferred Alternative that was submitted to the Assistant Secretary of the Army for Civil Works (ASA(CW)), under Section 203(a)(1) of the Water Resources Development Act (WRDA) of 1986 (33 U.S.C. 2231(a)(1)), as amended. Pertinent background information on the Comprehensive Everglades Restoration Plan (CERP), Central Everglades Planning Project (CEPP), and the SFWMD Section 203 Feasibility Report and Environmental Documentation (**SFWMD Section 203 Report**) are incorporated by reference in an effort to avoid duplication of documents. The 2014 CEPP Final Report is located: http://www.saj.usace.army.mil/Portals/44/docs/Environmental/CEPP/01_CEPP%20Final%20PIR-EIS%20Main%20Report.pdf. The SFWMD Section 203 Report, including appendices are located in Annex A of this Draft EIS.

The currently authorized 2014 CEPP Plan stores, treats, and redirects 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 authorized CEPP delivers 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 SFWMD Section 203 Report is to provide additional storage and treatment above that included in the 2014 CEPP authorized plan, to further reduce discharges from Lake Okeechobee to the Northern Estuaries and deliver water essential to Everglades' restoration, consistent with CERP performance goals.

Since congressional authorization of CEPP in 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 these discharges of 2017 to the estuaries, Florida Governor, Rick Scott, declared a state of emergency under Executive Orders (E.O.) 16-59, 16-155, and 16-156.

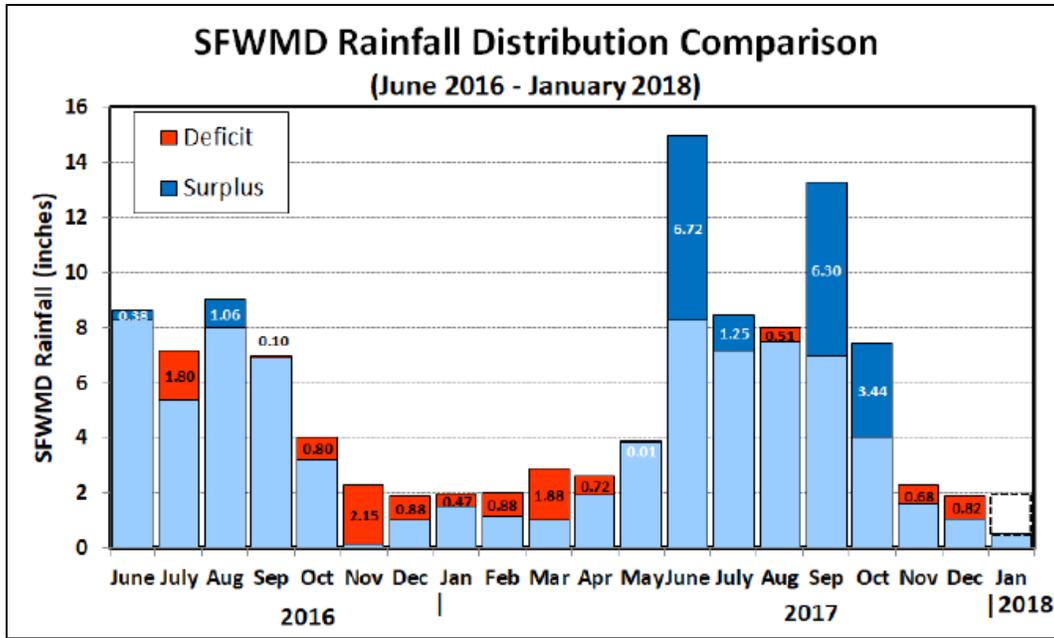


Figure 1-1. Lake Okeechobee Water Level Comparison for January 9, 2018

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 reduce the discharges by providing for 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.

Florida Law Chapter 2017-10 directs the expedited planning, design, and construction of improved conveyance, water storage and treatment in the EAA to reduce high-volume discharges to the Northern Estuaries and redirect flow to the Greater Everglades. The law directs the SFWMD to meet certain expedited timelines for implementing the project by preparing a study that would result in a Post Authorization Change Report to the currently authorized CEPP. The proposed changes to CEPP would require additional Congressional authorization.

1.2 STUDY AREA

The study area (**Figure 1-2**) for this project is the same area as the authorized CEPP: 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 SFWMD Section 203 report (page 1-13), Annex A for written descriptions of the area**).

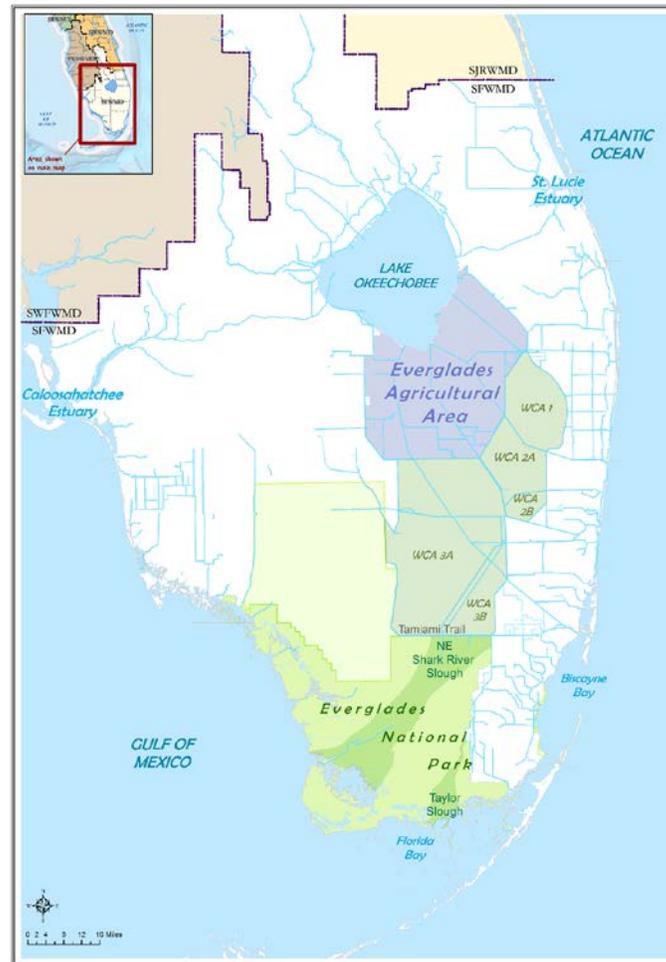


Figure 1-2. SFWMD Section 203 Study Area

1.3 PURPOSE: OBJECTIVES AND CONSTRAINTS

1.3.1 CERP, CEPP, and SFWMD Section 203 Goals and 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 to the SFWMD Section 203 Report (**Table 1-1. Goals and Objectives of CERP, CEPP, and SFWMD Section 203 Project**).

Table 1-1. Goals and Objectives of CERP, CEPP, and SFWMD Section 203 Project

CERP Objective	CEPP Objective	SFWMD Section 203 Project Objective
CERP Goal: Enhance Ecological Values		
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	Further reduce high-volume discharges from Lake Okeechobee to improve the quality of oyster and SAV habitat in the Northern Estuaries
	Restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades System	Further improve upon restoration of seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades System
	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	Further improve sheetflow patterns and surface water depths and durations in the Everglades system to reduce soil subsidence, the frequency of damaging peat fires, the decline of tree islands, and salt water intrusion
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
	Restore more natural water level responses to rainfall to promote plant and animal diversity and habitat function	Further restore more natural water level responses to rainfall to promote plant and animal diversity and habitat function
CERP Goal: Enhance Economic Values and Social Well-Being		
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
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 SFWMD Section 203 Study Constraints

The SFWMD constraints included constraints consistent with CERP to ensure that the Preferred Alternative would not reduce the level of service for flood protection, protect existing legal water supply users, and would meet applicable State water quality standards for the natural system. For SFWMD planning purposes, if a project is expected to result in an elimination or transfer of an existing legal source of water, the proposal would include an implementation plan that ensures a new source of water of comparable quantity and quality is available to replace the source that is being transferred or eliminated. Implementation of the project would not reduce the levels of service for flood protection within the areas affected by the project.

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, the following constraints were applied to the SFWMD Section 203 Project, many of which were included in the 2014 CEPP 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.”

1.4 REPORT AUTHORITY

CEPP was authorized by Congress in the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, which includes the Water Resources Development Act (WRDA) of 2016 as Title I, consistent with the WRDA 2000 CERP framework. The Section 203 Report is a proposed modification to CEPP that the SFWMD submitted to the ASA(CW) for review, approval, and subsequent transmittal to Congress for authorization under authority granted by Section 203 of the WRDA of 1986, as amended. The SFWMD Section 203 Report was prepared in accordance with Corps’ guidance contained in Engineering Regulation (ER) 1165-2-209 (February 4, 2016) for Section 203 studies of water resources development projects prepared by non-Federal interests.

1.5 DECISION TO BE MADE

This Draft EIS assesses potential environmental effects on the human environment as they relate to the SFWMD Section 203 Preferred Alternative in the SFWMD Section 203 Report. The decision to be made is whether to amend CEPP to include the SFWMD Section 203 Preferred Alternative components. The primary differences between CEPP and the SFWMD Section 203 Preferred Alternative are the conversion of the CEPP A-2 Flow Equalization Basin to a storage reservoir and inclusion of an STA within the A-2 footprint and adjacent parcels to treat the additional volume of water associated with the SFWMD Section

203 Preferred Alternative. This document includes environmental considerations to inform the Assistant Secretary of the Army of Civil Works' (ASA(CW)) determination of whether the Preferred Alternative is feasible and whether conditions may be appropriate for construction of the project.

2.0 EXISTING CONDITIONS/AFFECTED ENVIRONMENT

The existing conditions of this project remain essentially the same as listed in the **2014 Central Everglades Planning Project (CEPP) Final Integrated Project Implementation Report and Environmental Impact Statement (PIR/EIS) Section 2 and Appendix C.1** are, available upon request or at the following link: http://141.232.10.32/pm/projects/docs_51_cepp.aspx. In addition, the existing conditions within the project area are also documented within the **SFWMD Section 203 Report in Section 2.0, Table 2-1** and in further detail within **Appendix C.1 as the Future Without Project (FWO) condition**. The information presented in these two documents are hereby incorporated by reference within this Draft EIS.

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3.0 ALTERNATIVES

The plan formulation framework of the SFWMD Section 203 Report considered conveyance, above-ground storage, and wetland treatment measures within the Everglades Agricultural Area (EAA) consistent with the Comprehensive Everglades Restoration Plan (CERP) and Central Everglades Planning Project (CEPP), to capture, store, and deliver water south to the Greater Everglades. The Yellow Book Alternatives were considered and evaluated in CEPP, and since the SFWMD Section 203 Report is a modification of CEPP, they were not carried through in the alternatives analysis in this Draft EIS. The 2014 CEPP Project Partnership Agreement (PPA) North and PPA 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 and determined to be robust enough in the CEPP design to accommodate the additional timing shifts and flow volumes delivered by these alternatives.

To facilitate the evaluation of thousands of possible combinations of measures in the 2014 CEPP, screening criteria were developed to select the array of measures and plans for detailed modeling and evaluation. Four alternative plans and the no-action plan were evaluated using hydrologic simulation model outputs, with two alternatives using operational optimization. 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 Alternatives and Plan Formulation Strategy are available at the following website: <http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/>

3.1 ALTERNATIVES PLAN FORMULATION STRATEGY

In the 2014 CEPP, 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 PIR partially addressed the established CERP goals (1) to deliver treated new water to the natural system and (2) reduce damaging discharges to the Northern Estuaries (St. Lucie and Caloosahatchee). A larger reservoir and STA configuration was considered during the 2014 CEPP PIR 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” (CEPP PIR, Section 3.4, page 3-39). The rationale for rejecting a deep storage reservoir option in the 2014 CEPP PIR 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. At the time the 2014 CEPP PIR was prepared, this premise was appropriate. Since that time, there have been several concurrent years of well above average rainfall in both the wet and dry seasons that resulted in increasing Lake Okeechobee releases to the estuaries. These events highlighted the need to expedite CERP projects that would focus on reducing these damaging discharges.

In screening out the deep storage reservoir cost effective measure as cost prohibitive, the 2014 CEPP PIR developed the first increment of restoration to obtain early benefits and emphasized flows to the central Everglades when considering the collateral ecological benefits that would be expected from further reduction in damaging regulatory releases to the St. Lucie and Caloosahatchee estuaries that would occur with a deeper storage reservoir with greater capacity and operational flexibility than a shallow FEB. CEPP acknowledged

there would be a need for future investments. The SFWMD Section 203 Study reevaluated the authorized CEPP plan to determine if appropriate modifications and system-wide operations could be made to further address these concerns for damaging releases to the estuaries while also taking steps to meet the established CERP goal for delivery of new water to the Everglades ecosystem.

The 2014 CEPP PIR (Section 6.9.9, page 6-84) was also very clear to establish that future increments of CERP planning to include additional storage in the EAA could be expected to fully achieve CERP goals:

“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.”

The CEPP PIR (Section 6.9.1) references the National Academy of Sciences (National Resource Council 2007) recommendation on the implementation of CERP through an incremental adaptive restoration (IAR) process. This section discusses how CEPP adopted that recommendation and formulated a solution for an increment of overall restoration of the south Florida ecosystem and is not meeting all targets of CERP leaving problems and opportunities that remain. Although the CEPP provides a significant increase in freshwater needed for the restoration of the central Everglades, additional actions are needed to achieve the restoration envisioned in CERP. The actions include further reducing harmful discharges of freshwater from Lake Okeechobee to the St. Lucie and Caloosahatchee Estuaries and improve estuary habitat for oysters and SAV.

The South Florida Water Management District (SFWMD) Section 203 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 **SFWMD Section 203 Report, Appendix E**, and in **Section 3.2 of the main report (Annex A)**.

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 parcel and the A-2 parcel. Selection of a suitable location for the new storage and treatment measures included consideration of the following: 1) direction from Congress in relation to the 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 concerns.

These aforementioned considerations were addressed in the SWMFD Section 203 Report using 16 criteria in its siting analysis on locating storage and treatment features. The criteria are grouped into the four general

categories of (1) existing infrastructure, (2) socio-political and environmental, (3) hydrology, and (4) construction and operations efficiency. Only one of the criteria addressed eminent domain authority. The siting analysis resulted in a unique ability to optimize project construction and operations to reduce the need for additional conveyance, capital construction and land acquisition costs.

The CERP components include a storage component, which is consistent with the SFWMD Section 203 Study. The identified land in the SFWMD Section 203 Report is located between and adjacent to the North New River Canal and Miami Canal which minimizes the need for new conveyance features to move water from Lake Okeechobee to the project components and the Water Conservation Areas (WCAs). The land parcels are also adjacent, or in close proximity, to existing water quality treatment facilities (Stormwater Treat Area (STA) 3/4 and STA 2) which provides the opportunity to optimize operations with minimal costs.

The 2014 CEPP authorized plan did not preclude future increments of CERP for additional storage in the Everglades Agricultural Area (EAA) and the CEPP report documented that the A-2 Flow-equalization Basin (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.

The SFWMD Section 203 Report evaluates alternatives and identifies a Preferred Alternative for final, not incremental, implementation of components of the CERP:

- Everglades Agricultural Storage Reservoirs (Component G)
- Flow to Northwest and Central WCA 3A (Component II)

The Preferred Alternative identifies incremental restoration for the following component:

- System-wide Operational Changes – Everglades Rain-Driven Operations (Component H)

CERP identifies capacity for 360,000 acres of storage south of Lake Okeechobee, for Component G. Considering anything short of 360,000 acre storage option a final action could limit achievement of CERP goals related to Component G.

As recognized in the CEPP PIR/EIS, “It is anticipated that the need for modifications to the 2008 LORS will be initially triggered by non-CEPP actions and that these actions will occur earlier than implementation of CEPP. Therefore, the CEPP project implementation report (PIR) will not be the mechanism to propose or conduct the required National Environmental Policy Act (NEPA) evaluation of modifications to the LORS.” (2014 CEPP PIR/EIS page 6-2). The same statement is true for the SFWMD Section 203 alternatives analysis as well, as the SFWMD Section 203 Report is not the mechanism to propose or conduct NEPA evaluation of modifications to LORS, and is therefore an incremental approach to restoration. However, there are operational refinements within LORS to optimize benefits. Operational changes may be the subject of future NEPA to adjust the System Operating Manual and may be further refined over time during adaptive management.

3.1.1 Screening

Screening of Alternatives took place by the SFWMD and was completed in accordance with the U.S. Army Corps of Engineers (Corps) Planning Guidance Notebook (Engineering Regulation (ER) 1105-2-100). Please refer to **the following sections of the SFWMD Section 203 Report; Addendum, Section 3.2 and Appendix E, Annex A** for full details regarding screening criteria and methodology. The SFWMD screening process resulted in the following management measures options being identified for further evaluation.

Storage and Treatment

- 10,500-acre by 23 feet (ft.) deep above-ground reservoir (on western A-2 and A-2 Expansion area); 6,500-acre STA (on eastern A-2); 16,500-acre by 4 ft. deep Shallow Reservoir (or FEB) on A-1
- 10,500-acre by 23 ft. deep above-ground reservoir (on eastern A-2); 6,500-acre STA (on western A-2 and A-2 Expansion area); 16,500-acre by 4 ft. deep Shallow Reservoir (or FEB) on A-1
- 20,500-acre by 18 ft. deep above-ground reservoir (on A-2, A-2 Expansion area and northern A-1) and 11,500-acre STA (on southern A-1)
- 20,500-acre by 18 ft. deep above-ground reservoir (on A-1 and A-2) and 11,500-acre STA (on western A-2 and A-2 Expansion area)
- Conveyance Improvement
- 1,000 cubic feet per second (cfs) of additional conveyance capacity in the Miami Canal and 200 cfs of additional conveyance capacity in the North New River Canal
- Reservoir Operations
- Multi-purpose water supply deliveries (environmental water supply deliveries and other water related needs)

Based on the results of the screening process, the management measure options identified above were used to develop an array of five (5) alternatives to be further evaluated.

3.2 FORMULATION OF THE FINAL ARRAY OF ALTERNATIVES

The formulation of the final array of alternatives for the SFWMD Section 203 Report was based on the interdependency of project components and adherence to study objectives. Benefits are realized in the Northern Estuaries and in the Everglades (south of the storage and treatment facilities and conveyance improvements) through storage, redistribution, and conveyance of water. Combining the options identified through the alternative plan formulation screening process resulted in an array of six (6) alternatives (R240A, R240B, R360C, R360D, C360C, and C240A) to be further evaluated.

Table 3-1. Final Array of Alternatives

Alternative	Components of the Alternative
R240A	<p>240,000 ac-ft (10,500 acres by 23 feet deep) above-ground reservoir located on the eastern A-2 parcel</p> <p>6,500-acre STA located on the western A-2 parcel and A-2 Expansion area</p> <p>A-1 FEB is unmodified</p> <p>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</p>
R240B	<p>240,000 ac-ft (10,500 acres by 23 feet deep) above-ground reservoir located on the western A-2 parcel and A-2 Expansion area</p> <p>6,500-acre STA located on the eastern A-2 parcel</p> <p>A-1 FEB is unmodified</p>

Alternative	Components of the Alternative
	<p>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</p>
R360C	<p>360,000 ac-ft (20,500 acres by 18 feet deep) above-ground reservoir located on the A-1 parcel and the eastern A-2 parcel</p> <p>11,500-acre STA located on the western A-2 parcel and the A-2 Expansion Area</p> <p>A-1 FEB is modified to a reservoir</p> <p>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</p>
R360D	<p>360,000 ac-ft (20,500 acres by 18 feet deep) above-ground reservoir located on the A-2 parcel, the A-2 Expansion area and the northern portion of the A-1 parcel</p> <p>11,500-acre STA located on the southern portion of the A-1 parcel</p> <p>A-1 FEB is modified to an STA in the south and a reservoir in the north</p> <p>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</p>
C360C	<p>360,000 ac-ft (20,500 acres by 18 feet deep) above-ground reservoir located on the A-1 parcel and the eastern A-2 parcel</p> <p>11,500-acre STA located on the western A-2 parcel and the A-2 Expansion Area</p> <p>A-1 FEB is modified to a reservoir</p> <p>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</p> <p>Additional operational flexibility is included which can serve multiple purposes including water supply as identified in Component G of the CERP</p>
C240A	<p>240,000 ac-ft (10,500 acres by 23 feet deep) above-ground reservoir located on the eastern A-2 parcel</p> <p>6,500-acre STA located on the western A-2 parcel and A-2 Expansion area</p> <p>A-1 FEB is unmodified</p> <p>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</p> <p>Additional operational flexibility is included which can serve multiple purposes including water supply as identified in Component G of the CERP</p>

3.2.1 No Action Alternative – 2014 CEPP (Alt4R2)

The 2014 CEPP authorized plan, known as Alt4R2 is the No Action Alternative. The SFWMD Section 203 Report assumed that all components within CEPP Alt4R2 were constructed as detailed in the plan, which are described in detail in the CEPP PIR/EIS (2014), 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. No Action Alternative – 2014 CEPP Alt4R2.**

Table 3-2. No Action Alternative Conditions

Category	No Action Alternative (CEPP 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
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.

- I. **Everglades Agricultural Area (EAA)** (North of the Redline) 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 FEB and associated distribution features on the A-2 footprint that is 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 2014 CEPP modifies operations of the reservoir to return a portion of this water back to Lake Okeechobee, from which water can 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 Lake Okeechobee Regulation Schedule (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 Water Resources Development Act (WRDA) of 2000 Savings Clause requirements for water supply and flood control performance levels.

The hydrologic modeling conducted for all 2014 CEPP alternatives to optimize system-wide performance incorporated the current Regulation Schedule management bands of the 2008 LORS. The hydrologic modeling of the CEPP 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 CEPP 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 Section 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 **CEPP Final PIR/EIS Appendix A**.

Independent of CEPP implementation, there is an expectation that revisions to the 2008 LORS would be needed following the implementation of other Comprehensive Everglades Restoration Plan (CERP) projects and Herbert Hoover Dike (HHD) infrastructure remediation. The U.S. Army Corps of Engineers (Corps) 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 **CEPP Final PIR/EIS Section 2.5**), as described in **CEPP Final PIR/EIS Section 6.1.3.2**, or (2) completion of sufficient HHD remediation for reaches 1, 2 and 3 and associated culvert improvements, as described in **CEPP Final PIR/EIS Section 2.5.1**. 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. The future LORS which may be developed in response to actions (1) and/or (2) is unknown at this time. It is anticipated that the need for modifications to the 2008 LORS would be initially triggered by non-CEPP actions and that these actions would occur earlier than implementation of CEPP. Therefore, the CEPP PIR would not be the mechanism to propose or conduct the required National Environmental Policy Act (NEPA) evaluation of modifications to the LORS. However, depending on the ultimate outcome of these future LORS revisions, including the level of inherent operational flexibility

provided with these revisions, CEPP implementation may still require further LORS revisions to optimize system-wide performance and ensure compliance with Savings Clause requirements.

- II. **WCA 2A and Northern WCA 3A** (South of the Redline) 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 converting the L-4 Canal into a spreader canal by removing 2.9 miles of the southern L-4 Levee are the key features needed to ensure spatial distribution 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 **CEPP Final PIR/EIS Appendix A**.

- III. **Southern WCA 3A, WCA 3B, and ENP** (Green/Blue Lines) 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 flowway (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 flowway is aligned

to the width of the downstream 2.6-Mile Tamiami Trail Next Steps bridge, optimizing the effectiveness of both the flowway 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 flowway, 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 flowway, 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.

IV. **Lower East Coast Protective Levee** (Yellowline) 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, the recommended plan 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 recommended plan's 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 **CEPP Final PIR/EIS Section 6.10.1.2**, the Engineering Appendix (**Appendix A**), the analyses required by the Water Resources Development Act (WRDA) 2000 (**CEPP Final PIR/EIS Annex B**), and the CEPP Adaptive Management Plan (**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.

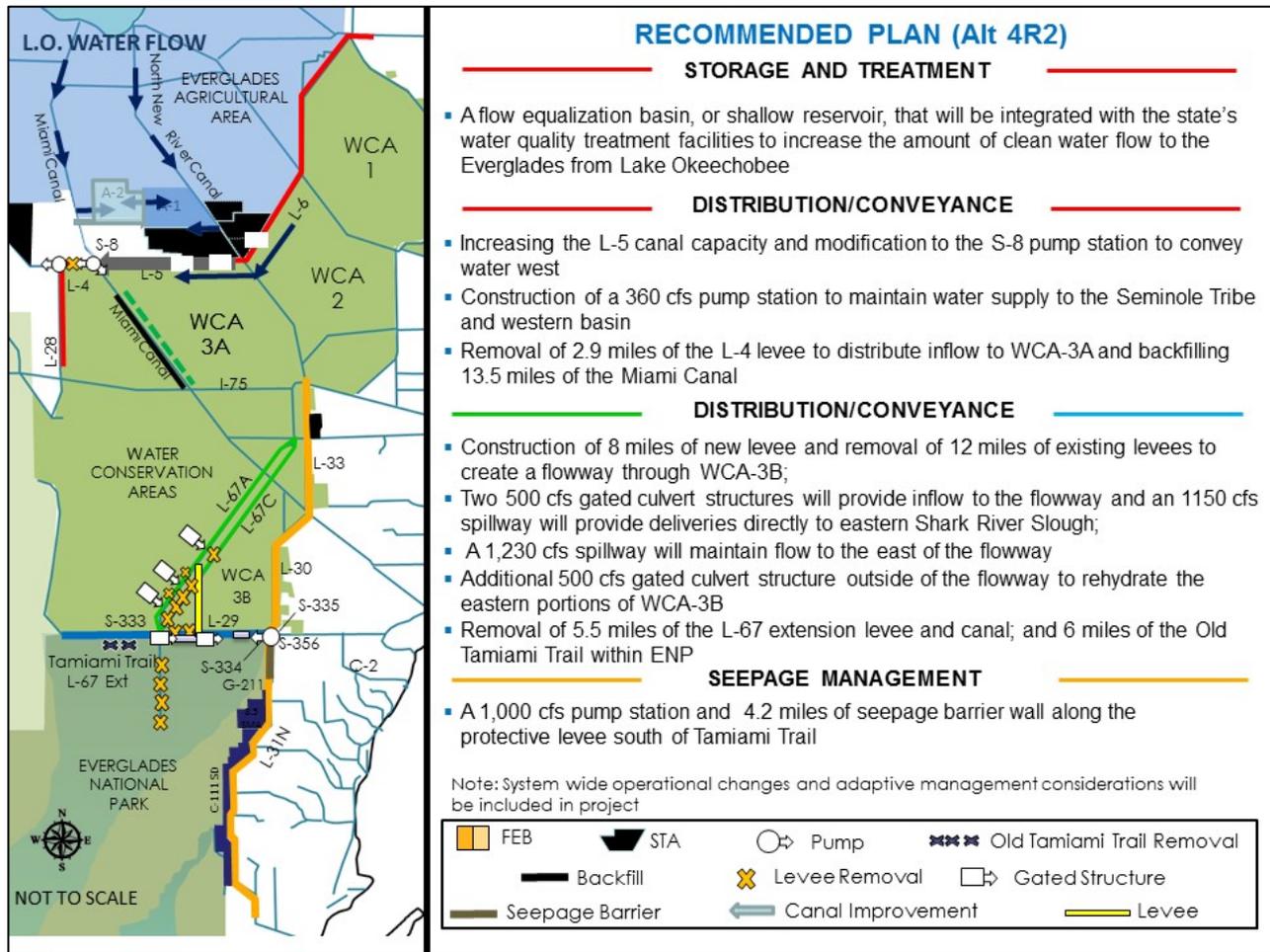


Figure 3-1. No Action Alternative – 2014 CEPP Alt4R2

3.2.2 Alternative R240A

The final array of alternatives is presented in **Figure 3-2. SFWMD Section 203 Array of Alternatives.**

Alternative R240A includes a 240,000 ac-ft above-ground reservoir and a 6,500-acre STA, located on the A-2 parcel and A-2 Expansion area, which would work in conjunction with the existing 60,000 ac-ft A-1 FEB, STA-2, and STA-3/4 to reduce nutrient levels in the freshwater so that it could be transferred into the Everglades. The proposed A-2 East Reservoir is 10,500 acres and designed to have a normal full storage water depth of approximately 23 ft. 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 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.

3.2.3 Alternative R240B

Alternative R240B includes a 240,000 ac-ft above-ground reservoir and a 6,500-acre STA, located on the A-2 parcel and A-2 Expansion area that would work in conjunction with the existing 60,000 ac-ft A-1 FEB, STA-2 and STA-3/4 to reduce nutrient levels in the freshwater so that it could be transferred into the Everglades. 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.

3.2.4 Alternative R360C

Alternative R360C includes a 360,000 ac-ft above-ground reservoir and an 11,500-acre STA, located on the A-1 parcel, the A-2 parcel, and the A-2 Expansion area, that would work in conjunction with the existing STA-2 and STA-3/4 to reduce nutrient levels in the freshwater so that it could be transferred into the Everglades. 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 conveyed 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.

3.2.5 Alternative R360D

Alternative R360D includes a 360,000 ac-ft above-ground reservoir and an 11,500-acre STA, located on the A-1 parcel, the A-2 parcel, and the A-2 Expansion area, that would work in conjunction with the existing STA-2 and STA-3/4 to meet reduce nutrient levels in the freshwater so that it could be transferred into the Everglades. 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.

3.2.6 Alternative 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 CERP. The operational flexibility used in C360C is implemented by dividing the reservoir into two operational zones. These zones are the bottom one third of the storage volume and the upper two-thirds of the storage volume. The bottom one-third of the reservoir storage volume only releases water to the environment (downstream Everglades). When the reservoir is in the upper two-thirds of the storage volume, releases are made from the reservoir to both the environment (downstream Everglades) and to maintain canal elevations in the Miami and North New River basins of the Everglades Agricultural Area.

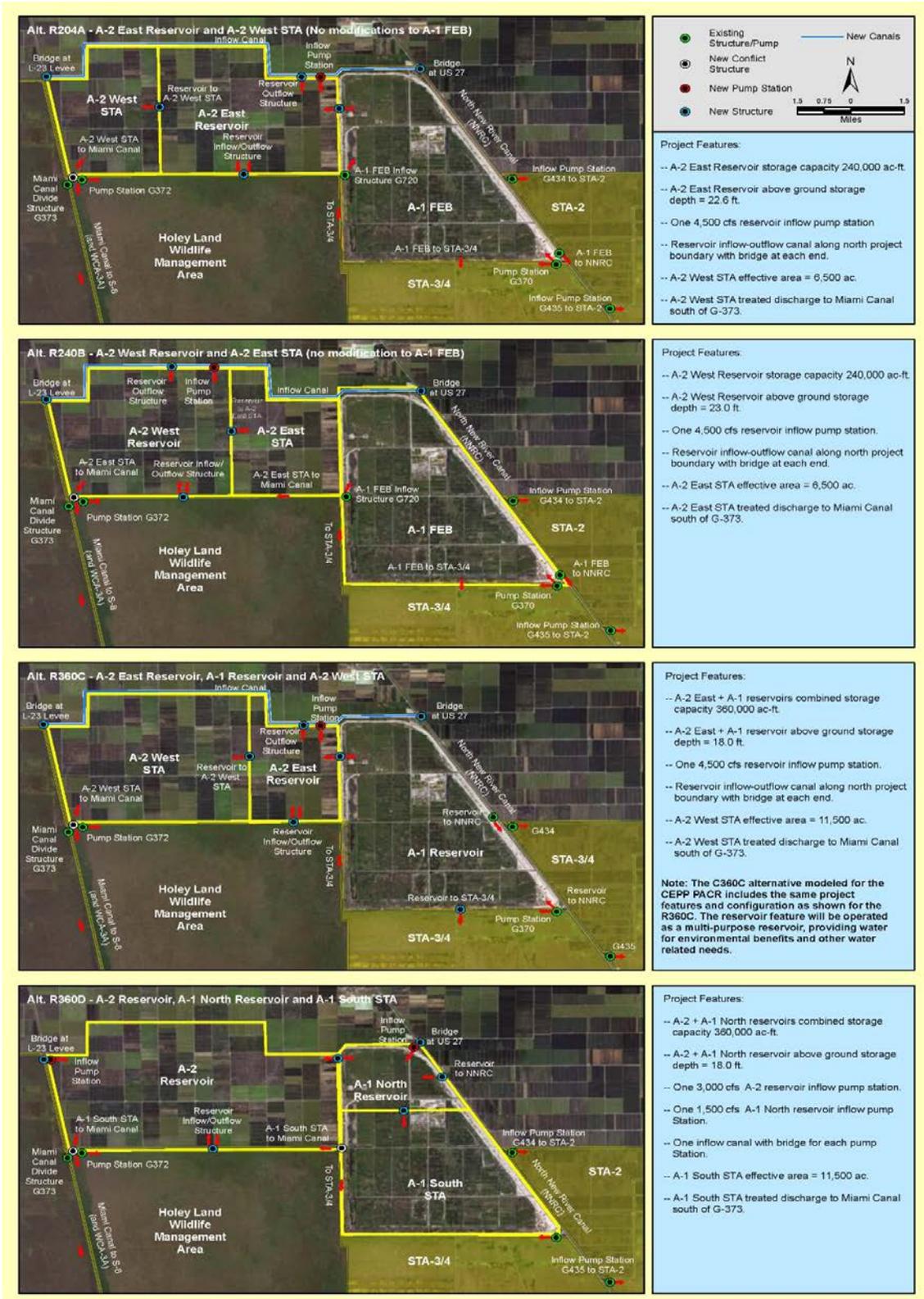


Figure 3-2. SFWMD Section 203 Array of Alternatives

3.2.7 Operational Refinements and Evaluation of Alternatives

Alternative designs to decrease the construction costs and add multi-purpose operations to a 240,000 ac-ft. storage reservoir were recommended based on the acceptability analysis (**SFWMD Section 203 Report, Section 4.1.2**) and efficiency analysis (**SFWMD Section 203 Report, Section 4.2.3.2**). The incremental annual average cost versus annual average Habitat Units (Hus) illustrated that Alternative R240A (\$2,564) is incrementally more cost effective than the Alternative C360C (\$3,029) (**SFWMD Section 203 Report, Table 4-10**). Learning from the operational benefits gained from Alternative C360C, similar operations were applied to the 240A design configuration.

Operations were refined for Alternative R240A, creating **Alternative C240A**, that provide additional ecological benefits to the Northern Estuaries, the Greater Everglades, and for other water-related needs of the region. These refined operations are described in detail in the **SFWMD Section 203 Report, Annex C**. Alternative C240A performed better than the more costly best buy, Alternative C360C (**SFWMD Section 203 Report, Appendix G**). The advantage of the multi-use facility centers around a beneficial seasonal timing shift that allows water levels in the lower regulation bands of Lake Okeechobee to be maintained slightly higher in Alternative C240A by maintaining canal levels with water from the reservoir when excess capacity is available. This water “saved” in Lake Okeechobee provides greater opportunity for dry season flow to the Everglades. It is important to note that releases from the reservoir to maintain canal levels are discontinued when the reservoir falls below the one-third volume and where the remaining volume is dedicated to environmental delivery consistent with CERP Yellow Book assumptions. From a Northern Estuary perspective, the C240A operations is also advantageous since it creates available storage for wet conditions and allows some potential estuary releases to be diverted to the reservoir, thereby reducing the counts of damaging events.

The performance improvements were observed with modeling refinements and increased habitat unit assessment results identified by the operational flexibility (environmental benefits and other water related needs) provided by the C240A alternative. Alternative C240A would be expected to offer a total 28,768 HU lift over the FWO. The C240A alternative preserves the A-1 FEB of the State’s Restoration Strategies Program project features. The average annual cost per average annual HUs of Alternative C240A is \$1,961 because Alternative C240A has the same cost as Alternative R240A but offers more ecological benefits in terms of HUs.

Table 3-3. Habitat Unit Evaluation Comparison

Project Region (Zone)	No Action	Alt R240A Alt R240B ²	Alt C240A	Alt R360C Alt R360D ²	Alt C360C ²
Caloosahatchee Estuary (CE-1)	39,038	40,458	41,168	41,168	41,878
St Lucie Estuary (SE-1)	8,247	8,996	9,296	9,446	9,446
Total Northern Estuaries	47,285	49,454	50,464	50,614	51,324
Northeast WCA 3A (3A-NE)	91,372	92,606	95,076	92,606	92,606
WCA 3A Miami Canal (3A-MC)	54,746	56,310	59,438	56,310	56,310
Northwest WCA 3A (3A-NW)	54,198	55,606	57,013	55,606	55,606
Central WCA 3A (3A-C)	111,159	111,159	111,159	111,159	111,159
Southern WCA 3A (3A-S)	68,423	69,247	69,247	69,247	69,247
WCA 3B (3B)	59,125	59,982	59,982	59,982	59,982
Northern ENP (ENP-N)	97,596	100,098	98,847	100,098	100,098
Southern ENP (ENP-S)	169,400	171,786	171,786	174,172	174,172

Project Region (Zone)	No Action	Alt R240A Alt R240B ²	Alt C240A	Alt R360C Alt R360D ²	Alt C360C ²
Southeast ENP (ENP-SE)	83,764	83,764	83,764	83,764	83,764
Total Greater Everglades (WCA 3 & ENP)	789,783	800,558	806,312	802,944	802,944
Florida Bay West (FB-W)	41,100	44,200	44,200	44,200	44,200
Florida Bay Central (FB-C)	13,950	15,600	15,600	15,600	15,600
Florida Bay South (FB-S)	28,300	30,300	30,300	30,300	30,300
Florida Bay East Central (FB-EC)	34,300	36,100	36,100	36,900	36,900
Florida Bay North Bay (FB-NB)	2,660	2,790	2,790	2,790	2,790
Florida Bay East (FB-E)	9,820	10,200	10,200	10,200	10,200
Total Florida Bay	130,130	139,190	139,190	139,990	139,990
Total All Regions	967,198	989,202	995,966	993,548	994,258

3.3 ALTERNATIVES ELIMINATED FROM FURTHER EVALUATION

Early screening outcomes identified a high potential for the SFWMD Section 203 Report to meet or exceed the CERP Goals in sending water to the central Everglades. The screening analysis compared the Pre-CERP Baseline (USACE 2005) with the CERPA scenario from the RECOVER 2005 Initial CERP Update effort (RECOVER 2005) to establish the CERP Goal for flow to the central portion of the Everglades. This analysis identified the CERP Goal flow target of approximately 300,000 ac-ft. of new water on an average annual basis over the 36-year modeled simulation period (1965-2000) available from RECOVER.

Based on the Principles and Guidelines evaluation criteria, the following table (**Table 3-4**) rates each alternative on its ability to meet the specified criteria (∅ not applicable; ≠ does not meet; + partially meets; ++ fully meets).

Table 3-4. Evaluation of Alternatives

Evaluation Criteria	Alt R240A	Alt R240B	Alt R360C	Alt R360D	Alt C360C
Effectiveness (SFWMD Section 203 Report Section 4.1.1)	+	+	+	+	+
Acceptability (SFWMD Section 203 Report Section 4.1.2)	+	+	≠	≠	≠
Completeness (SFWMD Section 203 Report Section 4.1.3)	+	+	+	+	+
Efficiency (SFWMD Section 203 Report Section 4.2.1)	++	≠	≠	≠	+

Alternative R240A rated slightly higher than Alternatives R240B, R360C, R360D, and C360C in meeting the evaluation criteria (**Table 3-4**). **SFWMD Section 203 Report Section 4.1.1** showed that all alternatives were similar in their effectiveness. **SFWMD Section 203 Report Section 4.1.2** showed there were similar levels of acceptability among the array of alternatives with the notable exception of some preference for the R240A and R240B alternatives based on concerns that the existing A-1 FEB should remain in place. Alternatives R360C, R360D, and C360C would require incorporating the A-1 FEB into the proposed storage reservoir. Resource agencies and interest groups had expressed concerns about potential impacts to the Restoration Strategies Project, the associated Consent Agreement, and the potential additional actions

that might be necessary to offset those adverse effects if the A-1 FEB were converted to deep storage. SFWMD Section 203 Report **Section 4.1.3** showed that all alternatives have the same completeness since all alternatives depend on implementation of the same set of CERP, CEPP, and non-CERP projects. **SFWMD Section 203 Report, Section 4.2.1** showed that Alternatives R240 and C360C were cost effective while the other three alternatives were not.

The CERP Goal flow target, based on a 36-year period of record, became the updated target for continued plan formulation work. Alternative C240A was ultimately able to achieve 97% of the CERP Goal over this 36-year period of record. However, consistent with CEPP, Alternative C240A was modeled and analyzed over the longer 41-year period of record (1965-2005). Similar to 2014 CEPP, the 41-year period of record was used in the evaluation of effects for the SFWMD Section 203 Study and Report. The evaluation of Alternative C240A resulted in an approximately 370,000 ac-ft increase in average annual flow to the central Everglades meeting the CERP Goal. Also consistent with CEPP, the 41-year period of record was used for the water quality evaluation to ensure adequate treatment of the increased flow.

All alternatives are described and evaluated completely in the **SFWMD Section 203 Report, Chapter 4** (Annex A). In this Draft EIS, the Corps is evaluating the effects only on the No Action Alternative (CEPP Alt4R) and the SFWMD Section 203 Preferred Alternative (C240A).

3.4 ENVIRONMENTALLY PREFERRED PLAN

The environmentally preferred alternative is the same as the Recommended Plan, Alternative C240A. The goal in formulating these alternatives are 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 SFWMD Section 203 Report has been formulated to address the following problems and opportunities:

- High-volume damaging freshwater discharges from Lake Okeechobee to the Northern Estuaries.
- Need for additional freshwater flow to the Everglades system.
- Identify the next increment of storage, treatment and conveyance south of Lake Okeechobee to reduce ongoing ecological damage to the Northern Estuaries and Everglades system.

For the SFWMD Section 203 Report, the authorized 2014 CEPP, along with other CERP and non-CERP projects within the study area that have been authorized, are under construction, or are completed, are assumed to be in place and operational in the FWO project condition.

The SFWMD Section 203 Preferred Alternative successfully reduces high-volume freshwater discharges from Lake Okeechobee, adding to the beneficial effects of the CEPP plan for approximately 86,000 acres in the Caloosahatchee and St. Lucie Estuaries; provides improvements to approximately 480,000 acres of Florida Bay; and provides benefits from redirected flows to over 1 million acres of freshwater wetlands of the Greater Everglades. Applying the same methodology to quantify ecosystem benefits that was used in development of the authorized CEPP plan, the SFWMD Section 203 Preferred Alternative would provide an increase of 28,768 average annual HUs compared to the FWO project condition for the period of analysis.

The SFWMD Section 203 Preferred Alternative would further decrease high-volume freshwater discharges from Lake Okeechobee that are currently sent to the Northern Estuaries beyond the expected improvements that would be achieved by the authorized CEPP plan. Further increases in additional water from Lake Okeechobee would be sent south through improvements to the existing NNR and Miami Canals to the new A-2 Reservoir and A-2 STA (in lieu of the A-2 FEB in the authorized CEPP plan). The new A-2 Reservoir would provide storage capacity and attenuation of high flows, and the new A-2 STA, with existing STAs (STA 2 and STA 3/4) would reduce phosphorus concentrations in the water to meet required water quality standards. The SFWMD Section 203 Preferred Alternative for the SFWMD Section 203 Report would not modify or alter any other features of the authorized CEPP plan or Restoration Strategies—leaving the A-1 FEB in place. The additional treated water provided by the SFWMD Section 203 Preferred Alternative is essential to Everglades’ restoration. The SFWMD Section 203 Preferred Alternative, along with the authorized CEPP and other authorized projects, would deliver approximately 370,000 ac-ft of new water on an average annual basis to the central Everglades to restore more natural quantity, timing and distribution of water to WCA 3A, ENP, and Florida Bay. As authorized in the CEPP plan, several existing levees, canals, culverts, and pump stations would be constructed, modified, or removed to improve the flow of water through the system and provide for other water related needs, including the additional water that would be provided by the SFWMD Section 203 Preferred Alternative.

Based on application of the same environmental benefit model used in the CEPP planning process, the SFWMD Section 203 Preferred Alternative would produce an increase in average annual habitat units over the authorized CEPP plan. **Table 3-5** provides a comparison, by CEPP region, of the average annual habitat units for CEPP and for the SFWMD Section 203 Report.

Table 3-5. Comparison of Average Annual Habitat Units (HUs) for CEPP and SFWMD Section 203 alternatives

Project Region (Zone)	CEPP Plan HUs ¹	Alt C240A HUs	Alt C240A HU Lift	Percent Increase
Caloosahatchee Estuary (CE-1)	39,038	41,168	2,130	
St. Lucie Estuary (SE-1)	8,247	9,296	1,049	
Total Northern Estuaries	47,285	50,464	3,179	6.7%
WCA 3A Northeast (3A-NE)	91,372	95,076	3,704	
WCA 3A Miami Canal (3A-MC)	54,746	59,438	4,692	
WCA 3A Northwest (3A-NW)	54,198	57,013	2,815	
WCA 3A Central (3A-C)	111,159	111,159	0	
WCA 3A South (3A-S)	68,423	69,247	824	
WCA 3B (3B)	59,125	59,982	857	
ENP North (ENP-N)	97,596	98,847	1,251	
ENP South (ENP-S)	169,400	171,786	2,386	
ENP South East (ENP-SE)	83,764	83,764	0	
Total WCA 3 and ENP	789,783	806,312	16,529	2.1%
Florida Bay West (FB-W)	41,100	44,200	3,100	

Project Region (Zone)	CEPP Plan HUs ¹	Alt C240A HUs	Alt C240A HU Lift	Percent Increase
Florida Bay Central (FB-C)	13,950	15,600	1,650	
Florida Bay South (FB-S)	28,300	30,300	2,000	
Florida Bay East Central (FB-EC)	34,300	36,100	1,800	
Florida Bay North Bay (FB-NB)	2,660	2,790	130	
Florida Bay East (FB-E)	9,820	10,200	380	
Total Florida Bay	130,130	139,190	9,060	7.0%
Total All CEPP Regions				
	967,198	995,966	28,768	3.0%

¹ CEPP PACR – HU numbers calculated for SFWMD Section 203 Report FWO (which includes authorized CEPP plan). Total HU lift for CEPP plan compared to FWO CEPP was 285,689 HUs (from CEPP PIR)

Based upon average annual costs for the CEPP plan and the SFWMD Section 203 Preferred Alternative from **Table 3-6** below, the table compares the cost per habitat unit for 2014 CEPP and for the SFWMD Section 203 Preferred Alternative. The SFWMD Section 203 Preferred Alternative costs per habitat unit are presented for (1) total cost and cumulative lift for CEPP, as modified by the SFWMD Section 203 Preferred Alternative, and (2) incremental cost and habitat unit lift for the SFWMD Section 203 Preferred Alternative above the CEPP plan.

Table 3-6. Average Annual Cost/Habitat Unit for CEPP and SFWMD Section 203 Report SFWMD Section 203 Preferred Alternative

Plan	Average Annual Cost (2018 Price Levels)	Average Annual HU Lift	Average Annual Cost/HU
Authorized CEPP Plan	\$106,165,000	285,689 ¹	\$371
SFWMD Section 203 Preferred Alternative (Total Cost and Cumulative HU Lift)	\$143,104,000	314,457 ²	\$455
SFWMD Section 203 Preferred Alternative (Incremental Cost and HU Lift)	\$36,939,000	28,768	\$1,284

¹ Represents the HU lift provided by the authorized CEPP plan compared to the CEPP FWO

² Represents the cumulative HU lift provided by the authorized CEPP plan, as modified by the SFWMD Section 203 Preferred Alternative, compared to the 2014 CEPP FWO

The SFWMD Section 203 Preferred Alternative would provide the next increment of improvement upon restoration of ecosystem function in the Caloosahatchee and St. Lucie Estuaries expected under the authorized CEPP plan by further reducing the number, severity and frequency of regulatory releases of freshwater from Lake Okeechobee to the Northern Estuaries. As depicted in the top of **Figure 3-3**, the SFWMD Section 203 Preferred Alternative would reduce the number of damaging discharges to the Caloosahatchee Estuary (number of months flow was greater than 2,800 cfs from the C-43 Basin and Lake Okeechobee regulatory releases) by nine additional events over the FWO (**Table 3-7**). The SFWMD Section 203 Preferred Alternative would reduce the number of damaging discharges to the St. Lucie Estuary (number of months flow was greater than 2,000 cfs from Lake Okeechobee regulatory releases) by seven

additional events over the FWO (**Table 3-7**). At the bottom of the **Figure 3-3**, the number of damaging discharge events lasting longer than four consecutive months is reduced from six events in the FWO to three events in the SFWMD Section 203 Preferred Alternative. **Figure 3-4** shows the reduction in damaging discharges to the St. Lucie (number of times 14-day moving average flow is greater than 2,000 cfs from Lake Okeechobee regulatory releases) by 14 events over the FWO. At the bottom of the **Figure 3-4**, the number of discharge events lasting longer than four consecutive months is reduced from nine events in the FWO to four events in the SFWMD Section 203 Preferred Alternative.

Table 3-7. Incremental Change as a Result of the SFWMD Section 203 Preferred Alternative in the Reduction in Duration of High Volume Freshwater Discharges from Lake Okeechobee to the Northern Estuaries

High Volume Freshwater Discharges from Lake Okeechobee	FWO (CEPP) Number of Months	SFWMD Section 203 Preferred Alternative Number of Months	Difference in Number of Months	% Difference from FWO
St. Lucie Estuary (Mean Monthly Flows above 2000 cfs)	56	49	7	13%
St. Lucie Estuary (Mean Monthly Flows above 3000 cfs ¹)	24	21	3	13%
Caloosahatchee Estuary (Mean Monthly Flows above 2800 cfs)	70	61	9	13%
Caloosahatchee Estuary (Mean Monthly Flows above 4500 cfs ¹)	29	24	5	17%

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

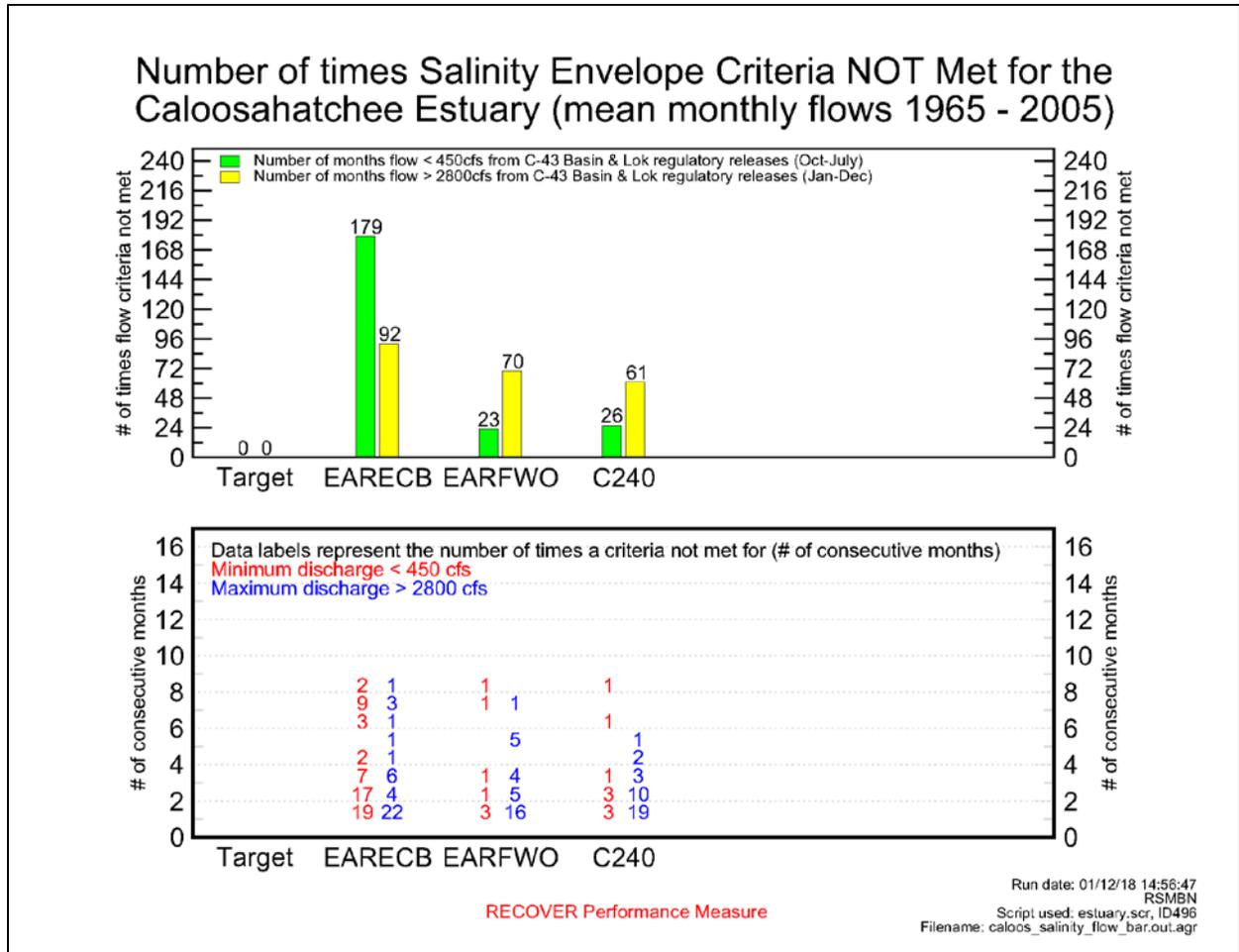


Figure 3-3. Number of Times Salinity Criteria not met for the Caloosahatchee Estuary for the ECB, FWO Project Condition, and the SFWMD Section 203 Preferred Alternative

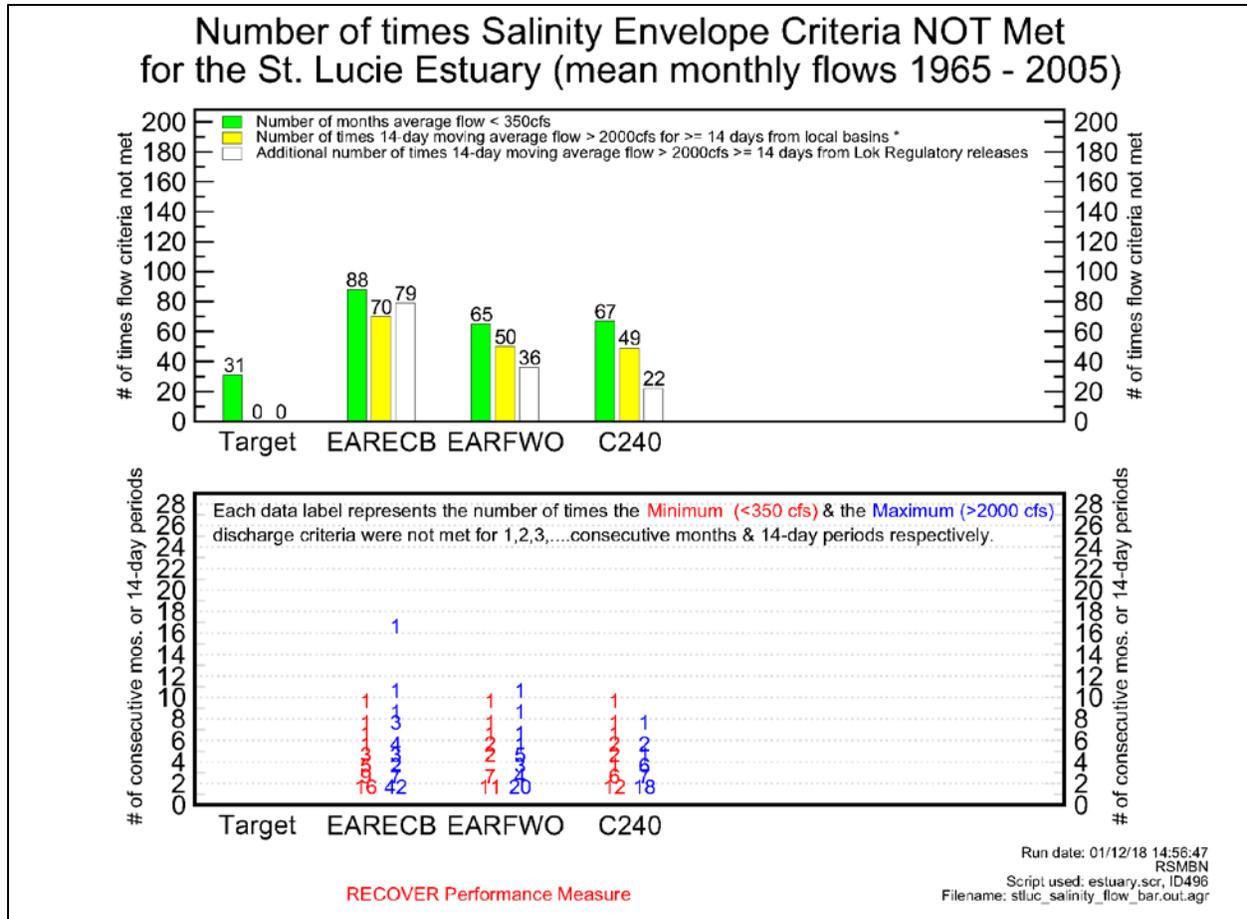


Figure 3-4. Number of Times Salinity Criteria not met for the St. Lucie Estuary for the ECB, FWO Project Condition, and the SFWMD Section 203 Preferred Alternative

The SFWMD Section 203 Preferred Alternative 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 authorized projects. High-flow discharges 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 SFWMD Section 203 Preferred Alternative would reduce the number of these discharges by an additional 40% in the Caloosahatchee Estuary and 55% in the St. Lucie Estuary. The reduction in discharges 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 discharges 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 SFWMD Section 203 Preferred Alternative provides an additional increment of the benefits envisioned in both CERP and CEPP, 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 damaging discharges 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 SFWMD Section 203 Preferred Alternative would 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. This additional freshwater flow is essential to Everglades' restoration and would add another increment of benefits to Everglades' restoration. 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 authorized features of the CEPP plan 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 SFWMD Section 203 Preferred Alternative reservoir 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 SFWMD Section 203 Preferred Alternative features 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 (version 2.3.2) for the period of simulation (1965–2005), differences in hydroperiods and stage between the SFWMD Section 203 Preferred Alternative and the FWO project condition show that the SFWMD Section 203 Preferred Alternative 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. The SFWMD Section 203 Preferred Alternative 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 authorized CEPP plan 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 SFWMD Section 203 Preferred Alternative would add to these benefits by providing additional new water to further facilitate restoration in the northern WCA 3A. Additional water from the SFWMD Section 203 Preferred Alternative 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 the SFWMD Section 203 Preferred Alternative as compared to the FWO (**Figure 3-5**).

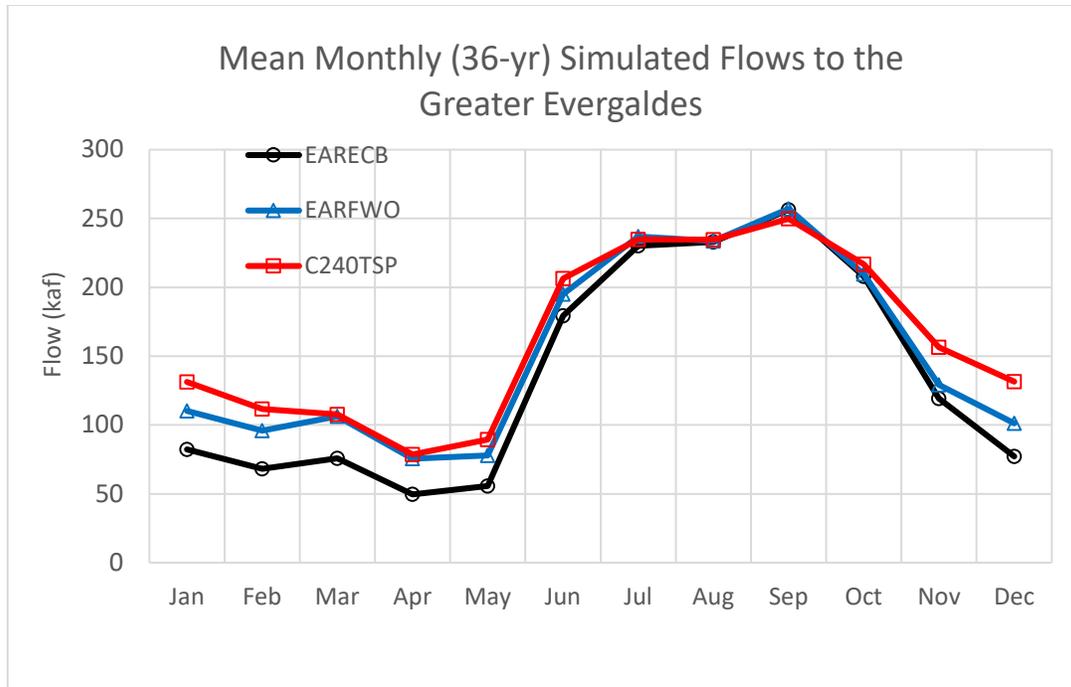


Figure 3-5. Timing of Treated Flows South into the Greater Everglades

The authorized CEPP plan 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 SFWMD Section 203 Preferred Alternative would facilitate the expected improvement.

The authorized CEPP plan is expected to rehydrate much of the 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 the SFWMD Section 203 Preferred Alternative would provide additional improvement to hydrological conditions in this area.

The additional water provided by the SFWMD Section 203 Preferred Alternative would improve conditions over those produced by the currently authorized CEPP plan. Similar to the authorized CEPP plan, the SFWMD Section 203 Preferred Alternative 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.

Further information pertaining to the evaluation of the SFWMD Section 203 Preferred Alternative is described in **Appendix G of the SFWMD Section 203 Report, Annex A.**

3.5 RECOMMENDED PLAN

Alternative C240A (**Figure 3-6. SFWMD Section 203**) is identified as the Recommended Plan. The Alternative C240A provides the same level of benefits, for less cost and meets the expressed desires of stakeholders by:

- Decreasing the occurrence of undesirable regulatory releases from Lake Okeechobee moving closer to the CERP Goal
- Increasing flows to the central Everglades to an average annual 370,000 ac-ft achieving the CERP Goal

The C240A alternative 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 plan and the overall justification for its selection as the SFWMD Locally Preferred Alternative is presented in more detail in the **SFWMD Section 203 Report, Section 6, Annex A.**

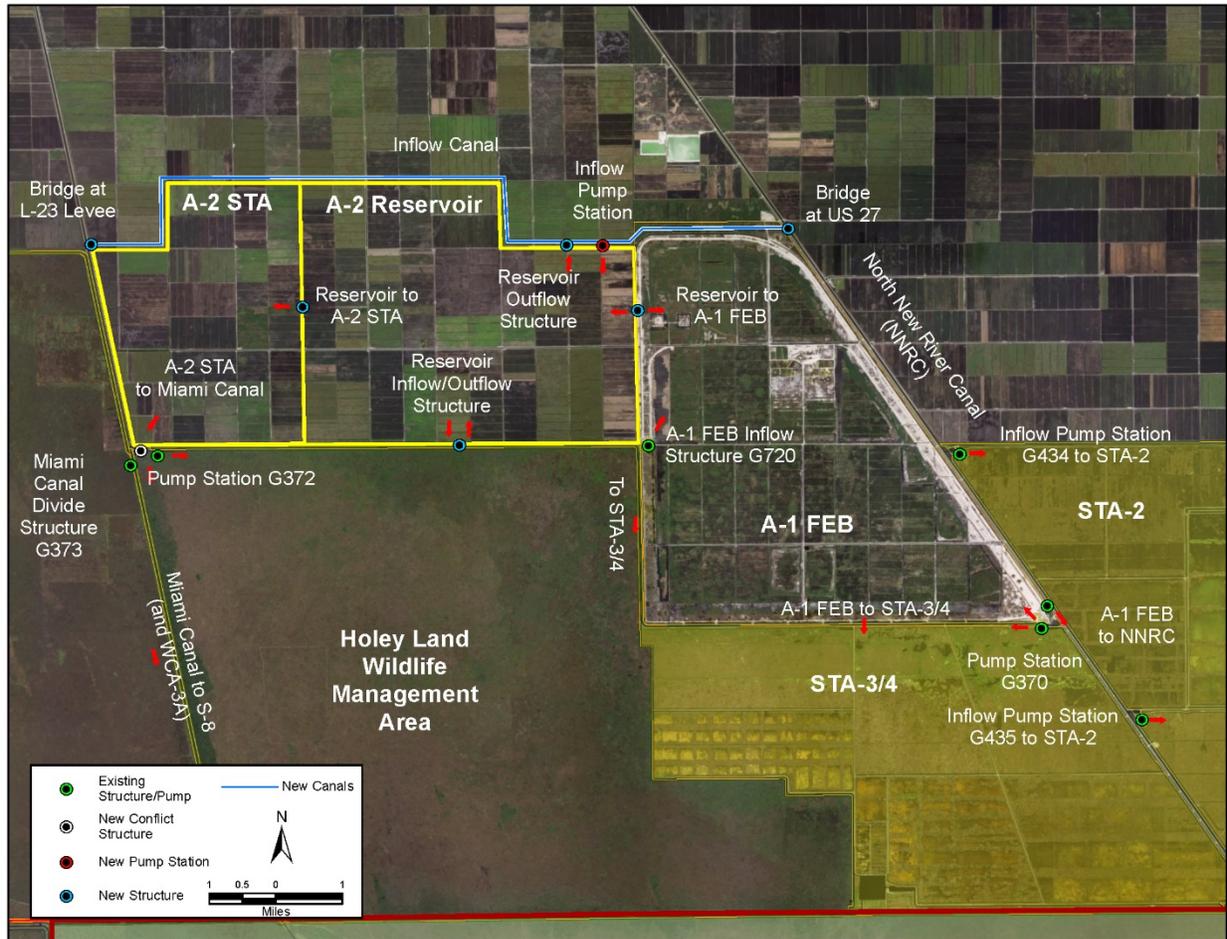


Figure 3-6. SFWMD Section 203 Preferred Alternative

3.5.1 Recreational Features of the Preferred Alternative

The proposed recreation facilities in the authorized 2014 CEPP plan will increase public access at project features in the EAA and into the Greater Everglades. Facilities in the authorized 2014 CEPP plan 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 CEPP PIR Appendix F, Recreation. The proposed modifications to 2014 CEPP by the SFWMD Section 203 Locally Preferred Alternative 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 **SFWMD Section 203 Report, 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- 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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4.0 ENVIRONMENTAL EFFECTS OF THE NO ACTION ALTERNATIVE AND THE RECOMMENDED PLAN

This Draft Environmental Impact Statement (EIS) compares the potential environmental effects on the human environment of the **No Action Alternative** (2014 Central Everglades Planning Project {CEPP}; also referred to as the **Future Without [No Action]** in the South Florida Water Management District (SFWMD) Section 203 Report) and the **Recommended Plan (SFWMD Preferred Alternative C240A (depicted as the TSP in the SFWMD Section 203 Report))**. The environmental effects of the **No Action Alternative, which is the CEPP Authorized Plan, Alt 4R2 are thoroughly described in the CEPP Final Integrated Project Implementation Report and Environmental Impact Statement (PIR/EIS), Section 5.2, signed December 16, 2016 and are hereby incorporated by reference only**. The CEPP Final PIR/EIS is located at: <http://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Central-Everglades-Planning-Project/>.

The SFWMD Section 203 Report (**Annex A**) is heavily referenced throughout this National Environmental Policy Act (NEPA) document due to the extensive environmental evaluation and documentation the SFWMD completed on effects of all alternatives analyzed including the Recommended Plan and in conjunction with Corps planning principles to accept risk, and in this case, to move forward with restoration.

Because this NEPA documentation is for a federal action in response to a Section 203 Study that was prepared by a non-Federal entity, the U.S. Army Corps of Engineers (Corps), Jacksonville District, is utilizing best professional judgment and analysis/evaluation provided by the SFWMD in their Section 203 Report with Environmental Documentation that was submitted to the Assistant Secretary of the Army for Civil Works (ASA(CW)) on March 30, 2018; no additional modeling was conducted by the Corps. This NEPA document succinctly describes the effects due to the Recommended Plan; additional details regarding effects of the analysis of alternatives (**SFWMD Section 203 Report Section 4.1**) and the Recommended Plan (**SFWMD Section 203 Report, Section 5.0**) are provided and discussed in the **SFWMD Section 203 Report in further detail in Appendix C.2.2**.

The Recommended Plan would increase ecological benefits over those derived from the No Action Alternative by decreasing the number of discharges to the Northern Estuaries (**Table 1**) and providing additional freshwater flow to the Everglades. Compared to the No Action Alternative, the Recommended Plan 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 authorized projects. High-flow discharges 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 the Recommended Plan would reduce the number of these discharges by an additional 40% in the Caloosahatchee Estuary and 55% in the St. Lucie Estuary. The reduction in discharges 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 Discharges between No Action Alternative and Recommended Plan

High Volume Freshwater Discharges from Lake Okeechobee	No Action (CEPP) Number of Months	Recommended Plan Number of Months	Difference in Number of Months	% Difference from No Action Alternative
St. Lucie Estuary (Mean Monthly Flows above 2000 cfs)	56	49	7	13%
St. Lucie Estuary (Mean Monthly Flows above 3000 cfs ¹)	24	21	3	13%
Caloosahatchee Estuary (Mean Monthly Flows above 2800 cfs)	70	61	9	13%
Caloosahatchee Estuary (Mean Monthly Flows above 4500 cfs ¹)	29	24	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 Recommended Plan 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. This additional freshwater flow is essential to Everglades' restoration and would add another increment of benefits to Everglades' restoration. 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 authorized features of the 2014 CEPP 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 Recommended Plan reservoir 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 Recommended Plan 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 (RSM-GL) and LECSA (version 2.3.2) for the period of simulation (1965–2005), differences in hydroperiods and stage between the Recommended Plan and the No Action Alternative project condition show that the Recommended Plan would provide longer hydroperiods and greater overland flow volumes, especially in NW WCA-3A as compared to the No Action Alternative. 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 Recommended Plan would add to these benefits by providing additional new water to further facilitate restoration in the northern WCA 3A. Additional water from the Recommended Plan 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 the Recommended Plan as compared to the No Action Alternative.

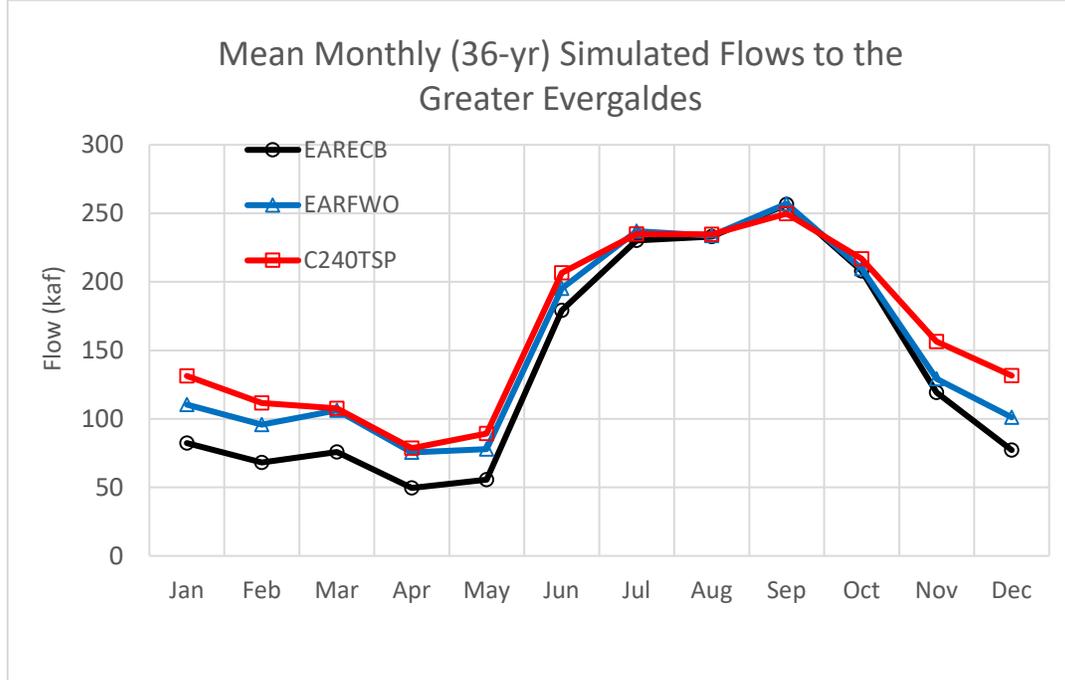


Figure 4-1. Timing of Treated Flows South into the Greater Everglades (EARFWO = No Action Alternative, C240TSP = Recommended Plan)

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 the Recommended Plan would facilitate the same expected improvements.

The No Action Alternative is expected to rehydrate much of the 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 the Recommended Plan would provide additional improvement to hydrological conditions in this area.

The additional water provided by the Recommended Plan would improve conditions over those produced by the No Action Alternative. Similar to the No Action Alternative, the Recommended Plan 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.

The change from the No Action (2014 CEPP A-2 FEB) and the Recommended Plan are depicted in **Figure 4-2**. The Recommended Plan would result in conversion of the 14,000 acre CEPP A-2 FEB to a 10,500 acre above-ground storage reservoir and 3,500 acre STA, with an additional 3,000 acre Stormwater Treatment Area (STA) on the A-2 expansion lands.

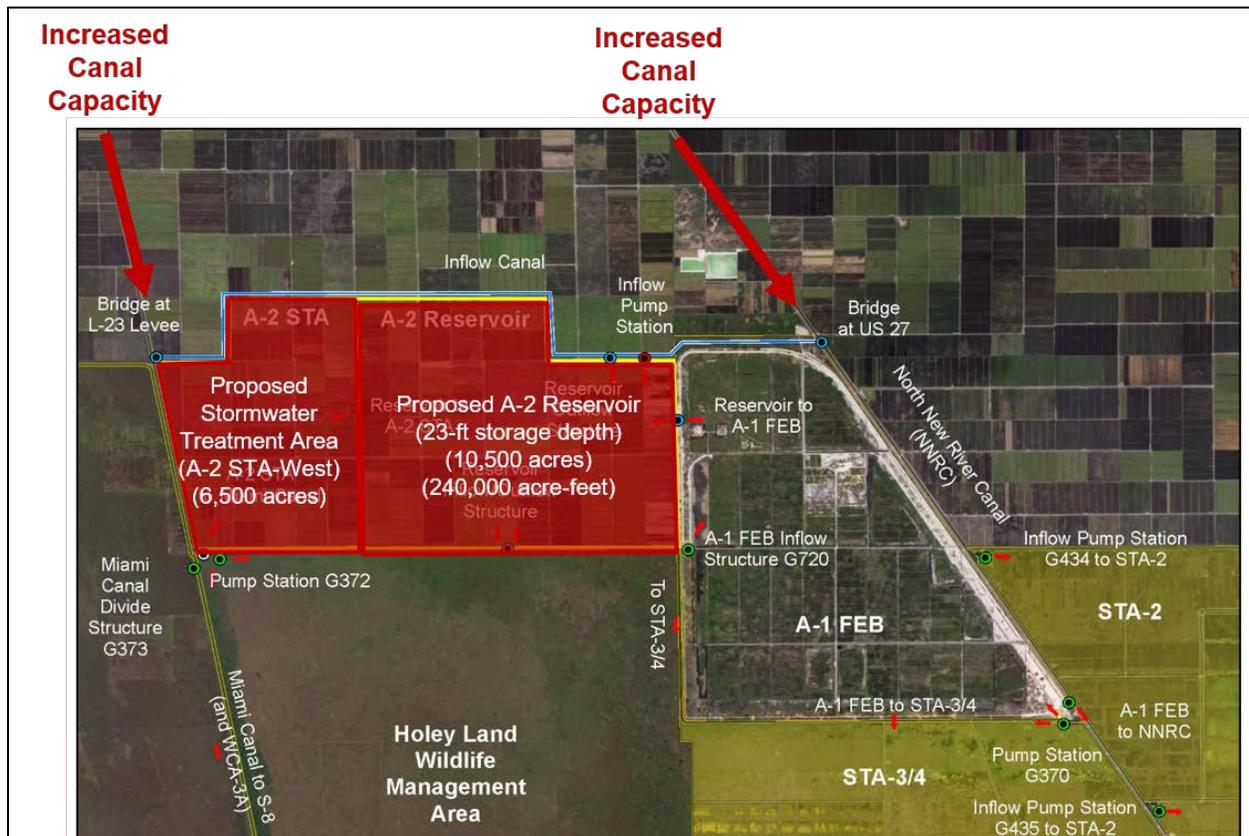


Figure 4-2. Recommended Plan Change from the No Action Alternative (CEPP Alt 4R2) (Red color indicates proposed changes from No Action Alternative).

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 Recommended Plan 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.

4.2 GEOLOGY AND SOILS

The Recommended Plan would result in conversion of the 14,000 acre CEPP A-2 FEB to a 10,500 acre above-ground storage reservoir and 3,500 acre STA, with an additional 3,000 acre Stormwater Treatment Area (STA) on the A-2 expansion lands. 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 Everglades Agricultural Area (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. The Recommended Plan 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. The Recommended Plan showed minor improved hydrologic conditions in northern WCA 3A, especially in the northwest (see **SFWMD Section 203 Report 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 Recommended Plan 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 Recommended Plan. Overall, however, lake stages would be within the beneficial range more often with the Recommended Plan relative to the No Action Alternative. Additionally, the Recommended Plan shows performance improvement within the Northern Estuaries as indicated by fewer high-volume flow months and less frequent damaging events providing a moderate beneficial effect (see **SFWMD Section 203 Report, 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 the Recommended Plan 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 SFWMD Section 203 Report **Appendix C.2.2** for a detailed comparison of potential effects to vegetation.

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 Recommended Plan. The Recommended Plan distributes almost all of its additional water through the CEPP-designed L-4 spreader canal across the northern Water Conservation Area (WCA 3A), thereby increasing hydroperiods and depths within this area more than any other area.

The Recommended Plan would act to 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. The Recommended Plan provides moderate improvements to the low-depth (0.0-1.0-foot) hydroperiods in WCA 2A compared to the No Action Alternative, but does nothing to decrease the duration of ponding depths below 0.0 foot and would slightly increase the duration of the high-depth (1.0–2.5- feet) hydroperiods (**SFWMD Section 203 Report Appendix C.2, Figure C.2.2-31**). Essentially, there is very little difference between the No Action and the Recommended Plan for WCA 2A. There is no difference between the Recommended Plan and the No Action on the environmental impacts of the hydrology in WCA 2B (**SFWMD Section 203 Report Appendix C.2, Figure C.2.2-32**).

The northwestern WCA 3A is the only region in the Greater Everglades where the Recommended Plan 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 this Recommended Plan and it is difficult to know exactly how the northwest region vegetation would respond to the increase flows associated with the Recommended 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 for this Recommended Plan (refer to **SFWMD Section 203 Report Annex D**).

Similar to the No Action Alternative, implementation of the Recommended Plan is expected to rehydrate Northeastern Shark River Slough (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 the Recommended Plan 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 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 Shark River Slough (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 SFWMD Section 203 Report** for detailed vegetation and figures, Annex A).

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 (SFWMD 2017 South Florida Ecological Report). Any additional inputs resulting from implementation of the Recommended Plan (refer to SFWMD Section 203 Report **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 the Recommended Plan study area would continue to be monitored, as described in the **SFWMD Section 203 Report** Water Quality and Adaptive Management sections in **Annex D**.

4.4 THREATENED AND ENDANGERED SPECIES

Federally threatened, endangered, and candidate species that may occur within the Recommended Plan action area (Palm Beach County) include: Florida panther (*Puma concolor coryi*), Everglade snail kite (*Ros-trhamus 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 2014 CEPP project footprint of the A-2 shallow FEB to an above ground deep reservoir and an additional 3,000 acres of uplands to a STA (**Figure 4-2**). The Corps determined that the Recommended Plan 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. Effects due to the change in hydrology due to the Recommended Plan are expected to remain the same as the determinations in the CEPP Final Biological Assessment (2013).

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 Recommended Plan, please refer to Appendix A of this EIS and the **SFWMD Section 203 Report Appendix C.2.1**.

4.5 STATE LISTED SPECIES

The Recommended Plan 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 **SFWMD Section 203 Report Appendix C.2.2**).

While small foraging or nesting areas utilized by many of these animal species may be affected by this project, the Recommended Plan 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 (**Appendix A of this 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 the Recommended Plan as compared to the No Action Alternative.

4.6 WILDLIFE

A comparison of the No Action Alternative and Recommended Plan 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 **SFWMD Section 203 Report, 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 the Recommended Plan would provide a minor long-term effect.

Due to the rehydration of WCA 3A and the conversion of agricultural land to 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 the Recommended Plan 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 **Appendix C.2.2.15**. High water is a concern for deer populations within northern WCA 3A that utilize tree islands. Deer and other upland wildlife species (bobcats, raccoons, and marsh rabbits) are mobile and would move in response to high water conditions from tree islands to 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 4.17-2** for more information).

4.7 ESSENTIAL FISH HABITAT

The No Action Alternative provided an EFH assessment in the 2014 CEPP 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 CEPP EIS. NMFS indicated that beneficial effects to fish resources and EFH may occur as a result of the 2014 CEPP authorized plan, and the CEPP study provided an evaluation (**2014 CEPP Final PIR/EIS, Appendix C.2.2.6**). In comparison with the No Action Alternative, the Recommended Plan 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 **SFWMD Section 203 Report Appendix C.2.2.7 and Appendix C.4.13**.

4.8 HYDROLOGY

A summary of the anticipated long-term hydrologic effects of the Recommended Plan, compared to the No Action Alternative, is presented in **Table 4-2**. Effects of the Recommended Plan on Hydrology. 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 Recommended Plan is provided in the **SFWMD Section 203 Report Section C.2.2.8 of Appendix C.2.2**. The summary of regional hydrologic differences includes quantitative comparisons between the No Action Alternative and Recommended Plan based on the Regional Simulation Model (RSM)-BN and RSM-GL CEPP modeling representations of the baseline and alternative. 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 **SFWMD Section 203 Report Section 4.2.2.**

Table 4-2. Effects of the Recommended Plan on Hydrology

Geographic Region	No Action Alternative	Recommended Plan
Lake Okeechobee	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.	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.
Northern Estuaries	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 B.	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 discharges and adverse effect for low volume discharges. The 14-day moving average above 2,000 cfs is reduced by 14 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 authorized projects. High flow discharges 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 discharges 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 discharges 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.

Geographic Region	No Action Alternative	Recommended Plan
<p>Greater Everglades: WCA 2A and WCA 2B</p>	<p>WCA 2A (2A-17): Moderate improvement. Stages are decreased by 0.1-0.3 ft. under all hydrologic conditions. 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>

Geographic Region	No Action Alternative	Recommended Plan
<p>Greater Everglades: WCA 3A and WCA 3B</p>	<ul style="list-style-type: none"> 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 are generally significantly increased by 0.6-0.8 ft. 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. 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. 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. 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. 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. 	<ul style="list-style-type: none"> 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. 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. 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. d) East-Central WCA 3A (3A-3): Minor beneficial effect. Stages slightly increased by less than a 0.1 ft., with no significant change during the wettest 5% of conditions. 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. 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. g) WCA 3B (Site 71): Negligible effect. Peak stages exceed 9.0 ft. NGVD less than 1% of period of simulation.

Geographic Region	No Action Alternative	Recommended Plan
Greater Everglades: ENP	<p>a) Northwest ENP (NP-201): Minor to moderate adverse effect. Stages are significantly decreased by 0.1-0.3 ft. under 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) Northeast ENP (NESRS-2): Major improvement. Stages are significantly increased by 0.5-0.9 ft. under all hydrologic conditions.</p> <p>c) Central ENP (P-33): Major improvement. Stages are increased by 0.2-0.4 ft. under all hydrologic conditions.</p> <p>d) Taylor Slough: 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>a) Northwest ENP (NP-201): Stages are increased by 0.1 ft. during 30% wettest hydrologic conditions</p> <p>b) Northeast ENP (NESRS-2): Minor improvement. Stages are not significantly (less than 0.1 ft.) increased under all hydrologic conditions.</p> <p>c) Central ENP (NP-33): Minor improvement. Stages are slightly increased under 40% wettest hydrologic condition.</p> <p>d) Taylor Slough: Stages are slightly increased by less than a 0.1 ft. during the driest 50% of hydrologic conditions.</p>
Southern Estuaries	<p>a) Biscayne Bay: Minor-to-moderate adverse effect. Combined total average annual canal discharges to central and southern Biscayne Bay are increased by 17,000 ac-ft (15%). Average annual canal discharges to northern Biscayne Bay are reduced by 46,000 ac-ft (11%).</p> <p>b) Florida Bay: 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) Biscayne Bay: Minor beneficial effects to nearshore Biscayne Bay. Combined total average annual canal discharges to central and southern Biscayne Bay are increased by 6,200 ac-ft (2%). Average annual canal discharges to northern Biscayne Bay are increased by 12,000 ac-ft (2%).</p> <p>b) Florida Bay: 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>

4.9 WATER QUALITY

The assessment of project impacts to water quality are summarized in **Table 4-4. Effects of Recommended Plan on Water Quality**. The detailed analyses are found in the **SFWMD Section 203 Report, Appendix C.2.1, Appendix C.2.2, and Annex F**.

Table 4-3. Effects of Recommended Plan on Water Quality

Geographic Regions	No Action Alternative	Recommended Plan
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 is currently under development via a public stakeholder driven process.	Relative to the No Action Alternative, no effect to lake water quality is expected.
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 levels, and improved estuary basin runoff quality.	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 Recommended Plan. The number of low-flow events would increase slightly in both estuaries but could potentially be managed with improved operations of local basin reservoirs such as C-43 and the C-23/24 reservoirs. 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. CEPP 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 CEPP, in combination with the A-1 FEB, STA-2, and STA-3/4, is sufficient to handle the additional CEPP flows (approximately 210 kac ft/yr) and still achieve the WQBEL. However, there are still uncertainties associated with treatment of CEPP flows using the existing conveyance features, STA facilities, and portion of A-1 FEB capacity. The CEPP adaptive management plan would address some of the	Dynamic Model for Stormwater Treatment Areas (DMSTA) DMSTA water quality modeling was performed, and STAs are sized to ensure Recommended Plan compliance with the water quality based effluent limits (WQBEL). However, to minimize risk, additional modeling prior to construction would need to affirm settling rates of zero within the reservoir to ensure water quality compliance. Water should not bypass the STA to the WCAs.

Geographic Regions	No Action Alternative	Recommended Plan
	<p>uncertainties associated with operating the integrated A-1/A-2 FEB integrated system. It is expected that the A-2 FEB would accrete peat soils and capture carbon from the atmosphere.</p>	
<p>Greater Everglades</p>	<p>WCA 2: Negligible effects. WCA 3A: 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 increased water column phosphorus concentrations at one or more TP rule 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. WCA 3B: Reduction in dry out events relative to No Action 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; however, this should have minimal impact on TP rule compliance long term. ENP: It is uncertain how changes in flow distributions proposed under CEPP would impact compliance with Appendix A of the 1991 Settlement Agreement. 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 treated to the WQBEL, and distributing these flows over the marsh</p>	<p>Negligible beneficial effects. Conditions in the WCA 2, WCA 3A, WCA 3B, and ENP would be expected to be similar to the No Action. WCA 3A: 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. ENP: It is uncertain how changes in flow distributions proposed would impact compliance with Appendix A of the 1991 Settlement Agreement. Over the long-term, adding more flow from the lake that is 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 a restored ecosystem. Relative to No Action, no change to Settlement Agreement compliance for Taylor Slough is expected.</p>

Geographic Regions	No Action Alternative	Recommended Plan
	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 a restored ecosystem	
Southern Estuaries	Improved salinity conditions relative to No Action condition. With-project mean salinity moves closer to the target with a 2 psu decrease in the 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.	Minor beneficial effects to salinity. Improved salinity conditions relative to No Action, with project salinity moves closer to the target with a 0.05 psu decrease in Florida Bay.

Consistent with the environmental effects detailed in Table 4-3, there remains significant uncertainty whether the SFWMD recommended plan as presently planned and designed will fully comply with State water quality standards and fully realize the indicated environmental benefits. If the ASA-CW determines that the SFWMD recommended plan is feasible, additional review will be necessary to determine environmental compliance with applicable water quality requirements of SFWMD's recommended plan, including U.S. Department of Justice (DOJ), U.S. Department of Interior (DOI), and the U.S. Environmental Protection Agency (EPA). This review may result in and/or also involve consultation with the Technical Oversight Committee (TOC) overseeing the State's plan for compliance with the requirements of the 1991 Federal Settlement Agreement (U.S. v. SFWMD, Case No. 88-1886-CIV-Moreno) addressing water quality. Such reviews and consultations may result in further recommendations to SFWMD's plan and/or its design to attain environmental compliance.

4.10 AIR QUALITY

Comparison between the No Action and the Recommended Plan 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 CO₂ 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 Recommended Plan 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 condition for the Recommended Plan (**Table 4-5**). The expanded HTRW assessment is found in the **SFWMD Section**

203 Report, Appendix C.2. HTRW reports and correspondence are found in **SFWMD Section 203 Report Annex H**. Any required corrective actions would be completed by the Non-Federal Sponsor, SFWMD.

Table 4-4. Effects on HTRW

Geographic Regions	No Action Alternative	Recommended Plan
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.
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.
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.
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.
Southern Estuaries	Response actions are completed on FDEP identified HTRW sites and new sites are documented and eventually remediated.	Same as No Action Alternative.

4.12 NOISE

The Recommended Plan would not 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

The EAA Storage Reservoir levee heights (37.1 feet) would result in a long-term adverse effect, as the view from Lake Okeechobee would be blocked. 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 Recommended Plan, would have long-term minor beneficial effects to aesthetics in the overall study area by improving ecological conditions.

The reservoir would reduce high volume discharges 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. Long-term effects would be due to the establishment of a permanent man-made reservoir and STA supporting infrastructure.

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 hydropatterns 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

For the Recommended Plan, almost all the future development within the study area is expected to occur on lands that are currently or formerly used for agriculture. The Recommended Plan would shift 3,000 acres from agricultural land use with wetland soils to higher quality wetlands with the conversion of the A-2 Expansion area from sugar cane to an STA. The Recommended Plan adds higher quality wetland habitat and improved functionality adjacent to the Greater Everglades. However, it converts the shallow A-2 FEB to a reservoir, thereby eliminating any wetland benefits gained in that area by the No Action Alternative (10,500 acres). Therefore in comparison with the No Action Alternative, implementation of the Recommended Plan 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 Recommended Plan 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 (refer to **SFWMD Section 203 Report Appendix A**), the Recommended Plan is expected to have a negligible effect on agriculture relative to No Action Alternative. Additional site-specific surveys and geotechnical investigations, including seepage modeling, will need to be conducted during the Pre-Construction Engineering and Design (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 USACE and the SFWMD, and approved by the USACE and SFWMD prior to construction, to ensure that the work meets USACE 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 **SFWMD Section 203 Report 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 United States Department of Agriculture (USDA) and National Resources Conservation Service (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 Recommended Plan. See **SFWMD Section 203 Report, 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 Recommended Plan.

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 Recommended Plan is presented in **Table 4-6. Effects of Recommended Plan on Water Supply and Flood Control**. The Recommended Plan would need to be assessed under Engineering Regulation (ER) 1110-2-1156 in order to meet federal standards for Dam safety; this would be completed prior to construction. The Recommended Plan (C240A) is compared to the No Action Alternative; similarly, the water supply and flood control effects of the No Action Alternative are described based on comparison to the Existing Condition Baseline. The summary of regional hydrologic differences includes quantitative comparisons between the No Action Alternative and the Recommended Plan 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 2014 CEPP 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. Based on the period of simulation analysis for the Recommended Plan, 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 4-5. Effects of Recommended Plan on Water Supply and Flood Control

Geographic Region	No Action	Recommended Plan
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. 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. Apart from the conversion of 3,000 acres within the A-2 Expansion, based on preliminary seepage analyses conducted by the SFWMD, the Recommended Plan is expected to have a negligible effect on agriculture relative to No Action condition. Additional site specific surveys, geotechnical data collection and geotechnical investigations, including seepage modeling, will need to be conducted during the Pre-Construction Engineering and Design (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 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.	Moderate flood control improvement. Compared to the No Action, the frequency of WCA 3A stages within Zone A of the 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.

<p>Lower East Coast Service Area 3 (Miami-Dade)</p>	<p>Moderate improvement for water supply and flood control, with no anticipated adverse effects.</p> <ul style="list-style-type: none"> 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- d) 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 control stages within the upper 10% of the stage duration curve. e) 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. f) An increased demand of 5 MGD is provided for LECSA 3. 	<p>No change from No Action.</p>

The Assistant Secretary of the Army for Civil Works (ASA-CW) will review the SFWMD Recommended Plan to determine whether the SFWMD complies with Federal law and regulation, to make a determination on the study’s feasibility, and to identify any conditions or recommendations. If the ASA(CW) determines that the SFWMD recommended plan is feasible, further engineering analysis of the SFWMD recommended plan will be required prior to or during the early activities of Pre-Construction, Engineering, and Design (PED) Phase to ensure compliance, including Engineering Regulation 1110-2-1156 and the CERP Design Criteria Memoranda (DCM).

The Engineering Appendix of the SFWMD report represents a limited level of design, but includes documentation of all engineering assumptions and conceptual designs. PED for CEPP features, as modified by the SFWMD Recommended Plan, could begin after Congressional authorization contingent upon ASA(CW) concurrence with the report and upon SFWMD’s concurrence consistent with the

implementation phases. All work would be coordinated and reviewed between the USACE and the SFWMD, and approved by the USACE and SFWMD prior to construction, to ensure that the work meets USACE guidance, standards and regulations and incorporates, as applicable, SFWMD design guidance. PED would include 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. The results of these analyses during PED may result in design modifications and/or revisions to the project total cost.

The USACE will ensure compliance with all applicable USACE Engineering Regulations and design standards for dams prior to final approval of the impoundment design and prior to initiating construction. The following additional analyses are required to be conducted prior to or during early activities of the PED Phase in support of the engineering design:

- (1) 2-dimensional embankment seepage calculations 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 along with updated slope stability analyses;
- (3) Consequence and Potential Failure Mode Analysis, including evaluation of consequences for potential life loss, economic damages, and environmental damages (ER 1110-2-1156) 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.

4.17.3 Environmental Justice (EJ)

The Recommended Plan 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 transformed into a STA. The Recommended Plan 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 or the Recommended Plan.

4.17.4 Recreation

Effects of the Recommended Plan on recreation are presented in **Table 4-7. Effects on Recreation**, with additional details provided in the **SFWMD Section 203 Report, Appendix C.2.2.15. Table 4-8** 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.

Table 4-6. Effects on Recreation

Geographic Regions	No Action	Recommended Plan
Lake Okeechobee	No Effect. There is no impact to recreational navigation.	Minor improvements for Recommended Plan based on improved recreational navigation opportunities.
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 Recommended Plan. Improving estuarine conditions would increase and enhance utilization of estuaries by fish and subsequently improve related recreational opportunities such as fish-
EAA	The FEB feature would add approximately 14,000 acres of recreational opportunities and recreation features similar to those in the Greater Everglades, providing a minor and less than significant beneficial effect.	Moderate beneficial recreation effects due to the STA and reservoir features would provide increased recreational opportunities including but not limited to fishing, sightseeing, hunting, hiking, biking, and bird watching.
Greater Everglades	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. Alt 4R2 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. 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	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.

Geographic Regions	No Action	Recommended Plan
	<p>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 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 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,</p>

Geographic Regions	No Action	Recommended Plan
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

Table 4-7. Closures Over the Period of Record in the EWMA for the No Action and Recommended Plan

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 Ac-	614	18	34.1	203	9	22.6	817	27	30.3	5.5%
C240A	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 Recommended Plan 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 Canal. Three cultural resources surveys have been conducted for approximately 30,000 acres of the APE and are documented in 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) (see Figure 1). 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 North New River (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, the Recommended Plan effects minimal change relative to the No Action Alternative. The project footprint will be enlarged by approximately 4,500 acres. As coordinated

during CEPP, the Corps will employ a phased process in the identification and evaluation of historic properties and an assessment of effects, consistent with Section 106 of the NHPA (36 CFR § 800.4[b][2]). Historic properties within the enlarged project footprint will be identified in subsequent culture resources studies. Effects to historic properties may include permanent inundation and/or physical destruction or damage to properties by construction of project features. Increased water flows would be introduced in such a way that no erosion would occur causing any resources to become exposed or damaged as they would in comparison to a fast flowing water course. 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 Preconstruction, Engineering, and Design (PED) phase of the project.

Post project authorization, each suite of features in the Recommended Plan 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. Supplementary cultural resources assessments will be conducted in areas that have not been previously surveyed. During PED and prior to construction, these surveys and a final determination of effects for any historic properties within the APE will be coordinated with the appropriate interested parties. Pursuant to Section 106 of the National Historic Preservation Act (54 U.S.C. 306108), the project design would be modified to avoid impacting significant historic properties and culturally significant sites where possible. Where avoidance is not possible, other mitigation measures would be considered, which could include, but are not limited to, data recovery excavations. Mitigation measures would be developed in consultation with the SHPO, the Advisory Council on Historic Preservation (ACHP), the appropriate federally-recognized tribes, and other interested parties as established in implementing regulations for Section 106 of the NHPA (36 CFR 800)

Pursuant to Section 106 of the NHPA, consultation has been initiated and is ongoing with the Florida SHPO and the appropriate federally-recognized tribes. As the Recommended Plan has not been subject to preliminary engineering and design, a determination of effects based on a precise APE cannot be stated at this time. Once the design has been finalized and prior to construction, the APE will be subject to separate consultation and consideration of effects with the appropriate interested parties. While the Corps is currently in compliance with the procedural requirements of the NHPA, the Corps recognizes that additional consultation and other requirements are not yet complete, but the project will be in full compliance prior to construction.

The effects of the Recommended Plan on cultural resources are presented in **Table 4-9**. These effects are preliminary and should not be considered final. Criteria used to evaluate the alternatives are found in the SFWMD Section 203 Report, Appendix C.2. A description of full preliminary analysis, background information, and descriptions of terms are presented in the SFWMD Section 203 Report, **Appendix C.2.1.17**.

Table 4-8. Effects of Recommended Plan on Cultural Resources

Cultural Resources (Please refer to Cultural Resources in SFWMD Section 203 Appendix C.2.1, Annex A for further details)		
Geographic Re-	No Action	Recommended Plan
Lake Okeechobee	No effect on cultural resources.	
Northern Estuaries	No effect on cultural resource.	
EAA, including As-sociated Canals and Structures	May result in long-term adverse effects on cultural resources 8PB16039 and 8PM16040.	Consistent with the No Action, the Recommended Plan may result in long-term adverse effects on archaeological 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.

4.19 INVASIVE SPECIES

The Recommended Plan 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 **SFWMD Section 203 Report, 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, subsistence, 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 **SFWMD Section 203 Report 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 SFWMD Section 203 Report **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 summarized in **Table 4.8-1** and **Table 4.9-1** and described in more detail in the **SFWMD Section 203 Report 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 Recommended Plan 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 South Florida Water Management District 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 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 the Recommended Plan 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 Recommended Plan.

Based on the SFWMD Section 203 report (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 Recommended Plan 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 Recommended Plan (6% increase). A water budget map for the Recommended Plan, 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 **SFWMD Section 203 Report 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 the Recommended Plan. 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 the Recommended Plan. 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 Recommended Plan (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 Recommended Plan as presented in the **SFWMD Section 203 report Annex F, Phosphorus Assessment**, has the potential for slightly degraded water quality conditions from discharges into WCA 3A if the STA/WQ treatment features are undersized. Additionally, if STA diversions are not eliminated, untreated water bypassed to WCA 3A will degrade water quality. The Recommended Plan as presented in the SFWMD Section 203 report Annex F, assumes a settling rate of 2.5 m/yr. Water quality experts from the Department of Interior (DOI) proposed a settling rate of zero and suggested that without vegetation, assuming a settling rate of 2.5 m/yr for a deep reservoir is very optimistic.

STA bypasses and significantly less uptake of phosphorus by the deep FEB's than predicted could result in a worsening of downstream conditions in WCA 3. Water quality treatment features may need to be more conservatively designed in PED (i.e. more treatment capacity to address uncertain Adaptive Management, adjusting flows to reduce/eliminate bypass events, and the addition of new treatment areas). By over estimating the uptake of the A-2 FEB, the STA may be undersized, which would lead to more water bypasses of the STA before being discharged into WCA 3.

In order to discuss changes from the No Action Alternative to the Recommended Plan, Government to Government consultation between the Corps and the Miccosukee Tribe was initiated by letter on April 18, 2018. Consultation is ongoing and will be updated prior to release of the Final EIS.

4.20.2 Seminole Tribe of Florida

General background information on the Seminole Tribe is provided in the **SFWMD Section 203 Report Section 2.6**. The changes in hydrology from the final array of alternatives for areas of interest to the Seminole Tribe are summarized in **Table 4.8-1** and described in more detail in the **SFWMD Section 203 Report 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 (P.L. No. 100-228, 101 Stat. 1566 and Chapter 87-292 Laws of Florida as codified in Section 285.165, Florida Statutes [F.S.]). Additional documents addressing the Water Rights Compact entitlement provisions have since been executed. These documents include Agreements between the Tribe and SFWMD and a SFWMD Final Order. Of interest in this regard is the 1996 Agreement, which commits the SFWMD to mitigate impacts to the Tribe's ability to obtain surface

water supplies at both the Brighton and Big Cypress Reservations, which may be diminished as a result of various activities.

Based on the **SFWMD Section 203 report (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 is shown to slightly decrease by approximately 0.9% compared to the No Action Alternative (**SFWMD Section 203 Report Figure C.2.2-55**) for the Recommended Plan. 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 (**SFWMD Section 203 Report Figure C.2.2-56**) for the Recommended Plan. The Seminole Tribe has surface water entitlement rights pursuant to the 1987 Water Rights Compact and subsequent entitlement provisions executed between the Seminole Tribe, the State of Florida, and the SFWMD. Impacts are not expected for the Recommended Plan based on the hydrologic modeling.

In order to discuss changes from the No Action Alternative to the Recommended Plan, 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 be updated prior to release of the 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. The following **Table 4-9 and Table 4-10** summarizes past, present, and projected Corps efforts that cumulatively affect the regional environment of south Florida.

Table 4-9. Past, present, and Reasonably Foreseeable Future Actions and Plan Affecting the Project Area

	Past Actions/Authorized Plans	Current Actions and Operating Plans	Reasonably Foreseeable Future Actions and Plans
Status of Non-CERP Projects	<ul style="list-style-type: none"> - C&SF Project (1948) - ENP Protection and Expansion Act (1989) - MWD GDM and Final EIS (1992) - C-111 South Dade GRR (1994) 	<ul style="list-style-type: none"> - MWD 8.5 SMA GRR (2000) - MWD Tamiami Trail Modifications Limited Reevaluation Report (2008) - C&SF C-51 West End Flood Control Project - Kissimmee River Restoration - Seepage Barrier near the L-31 N Levee (Miami-Dade Limestone Products Association) - Tamiami Trail Modifications Next Steps (TTMNS) Project - SFWMD Florida Bay Initiatives 	<ul style="list-style-type: none"> - SFWMD Restoration Strategies Project - MWD Closeout - C-111 South Dade Project (Contracts 8, 8A, and 9)
Operations Plan for Lake Okeechobee, WCA 3A, ENP and the SDCS	<ul style="list-style-type: none"> - Water Supply and Environment (WSE) Lake Okeechobee Regulation Schedule (2000) - IOP 2002 to Present 	<ul style="list-style-type: none"> - Lake Okeechobee Regulation Schedule (LORS 2008) - SFWMD LEC Regional Water Supply Plan - Everglades Restoration Transition Plan (ERTP) October 2012 to present; deviation includes Increment 1 and Increment 1.1 and 1.2 and 2.0 Operational Strategies - Herbert Hoover Dike Dam Safety Modification Study (HHD DSMS) risk reduction measures (2011 through 2025) 	<ul style="list-style-type: none"> - LORS 2008 to be replaced by revised Lake Okeechobee Regulation Schedule by 2024-2025 (per Integrated Delivery Schedule) - SFWMD periodically revises the LEC Regional Water Supply Interim Plan - ERTP to be replaced by COP to be anticipated 2020 to include MWD and C-111 components.
CERP Projects		<p>Congressional Authorization Received:</p> <ul style="list-style-type: none"> - Broward County Water Preserve Areas Project - Caloosahatchee River (C-43) West Basin Storage Reservoir <p>Central Everglades Planning Projects</p> <p>Congressional Authorization Received and Construction in Progress:</p> <ul style="list-style-type: none"> - Indian River Lagoon-South Project - Picayune Strand Restoration Project - Site 1 Impoundment Project - Biscayne Bay Coastal Wetlands Project - C-111 Spreader Canal Western Project (operated by SFWMD) 	<ul style="list-style-type: none"> - Future CERP Projects (Lake Okeechobee Watershed Restoration Project, Western Everglades Restoration Project - CEPP PPA South , including DOI removal of portions of the old Tamiami Trail roadway and SFWMD construction of the increased S-333 structure

Table 4-10. Summary of Cumulative Effects.

Hydrology	
Past Actions	Flood and water control projects have greatly altered the natural hydrology.
Present Actions	Federal and State agencies are coordinating on and implementing projects to improve hydrology.
Proposed Action (Recommended Plan)	Additional reductions in high discharge events from Lake Okeechobee to the Northern Estuaries would be realized by the Recommended Plan 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.
Future Actions	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.
Cumulative Effect	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	
Past Actions	Water management practices, importation of exotic species, and urbanization have resulted in the degradation of existing habitat function and direct habitat loss leading to negative population trends of threatened and endangered species.
Present Actions	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 maintain endangered species populations. The USFWS recovery plan is used as a management tool.
Proposed Action (Recommended Plan)	The Corps determined that the Recommended Plan 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 Recommended Plan (see SFWMD Section 203 Report, Annex D (Annex A)).
Future Actions	Ongoing CERP restoration projects are continuing to be developed and would be implemented to improve overall Everglades’ habitat with the intent to maintain threatened and endangered species within the project area.
Cumulative Effect	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.
Fish and Wildlife Resources	
Past Actions	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.
Present Actions	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.

Hydrology	
Proposed Action (Recommended Plan)	Negligible effects to fish and wildlife resources within Lake Okeechobee would be expected. Further reductions in the number of high discharge events 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 Recommended Plan converts the FEB to a reservoir, thereby reducing the available foraging and nesting opportunities for wading birds. The Recommended Plan 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.
Future Actions	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.
Cumulative Effect	Habitat improvement efforts are anticipated to benefit fish and wildlife resources.
Vegetation and Wetlands	
Past Actions	Drainage of Florida’s interior wetlands, conversion of wetlands to agriculture, and urban development has reduced the spatial extent and quality of wetland resources.
Present Actions	Efforts are being taken by State and Federal regulatory agencies to reduce wetland losses.
Proposed Action (Recommended Plan)	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 Recommended Plan is reducing the number of potential wetlands from a 14,000 acre FEB of No Action to a 10,500 acre reservoir and 3,500 acre STA. The reduction is 10,500 acres of FEB to reservoir will reduce the amount of wetlands and vegetation within that area.
Future Actions	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.

Hydrology	
Cumulative Effect	While the spatial extent of natural plant communities would not be restored to historic proportions, the quality of vegetative communities would be improved.
Cultural Resources	
Past Actions	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.
Present Actions	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.
Proposed Action (Recommended Plan)	The Recommended Plan 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.
Future Actions	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.
Cumulative Effect	Cumulative effects to historic properties and culturally significant sites will potentially be long-term adverse effects if not avoided. Mitigation measures for effects to historic properties could potentially reduce the cumulative effect to minor long-term adverse effects. Mitigation measures for culturally significant sites are unknown.
Water Quality	
Past Actions	Water quality has been degraded from urban, suburban, commercial, industrial, recreational and agricultural development.
Present Actions	Efforts to improve water quality from agricultural areas is ongoing. Federal and State projects would temporarily elevate localized levels of suspended solids and turbidity.
Proposed Action (Recommended Plan)	Implementation of the Recommended Plan 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 and ENP as a result of the Recommended Plan should not affect TP Rule compliance; however, additional modeling of the sizing of the STAs would need to be completed to ensure compliance with water quality standards. Over the long-term, adding more flow from the lake that is treated to the water quality based effluent limits (WQBEL) should result in improved water quality within WCA 3 and a reduction in flow-weighted mean total phosphorus concentration entering the Park. Southern Estuaries salinity conditions are expected to be slightly improved by the Recommended Plan.
Future Actions	Actions by the State of Florida's Restoration Strategies would decrease nutrient concentration and loadings to the project area. Lake Okeechobee Regulation Schedule update and development of the Combined Operating Plan (COP) for Modified Water Deliveries, WERP, and the Broward County Water Preserve Areas (BCWPA) Project would also be expected to benefit water quality. Specifically, the BCWPA (Record of Decision signed in 2012, authorized in WRRDA 2014) would reduce storm runoff deliveries to WCA 3 and improve water quality coming across Tamiami Trail.
Cumulative Effect	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.

Hydrology	
Water Supply/Flood Control	
Past Actions	Water supply and flood control for agricultural and urban users has benefited from construction and operation of the C&SF Project.
Present Actions	Availability of water from Lake Okeechobee for agricultural users was recently diminished through implementation of 2008 LORS. Availability of water for urban and agricultural users were recently diminished 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).
Proposed Action (Recommended Plan)	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 Pre-Construction Engineering and Design (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.
Future Actions	Future supplies would not change unless additional storage or hydrologic improvements are implemented and increase water availability.
Cumulative Effect	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 Recommended Plan, documented in the **SFWMD Section 203 Report, 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 Recommended Plan compared to the No Action Alternative are expected to range from negligible to moderate. Potential unavoidable adverse impacts that would result from implementation of the Recommended Plan 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 the Recommended Plan. 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 the Recommended Plan 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.

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5.0 ENVIRONMENTAL COMPLIANCE & PUBLIC INVOLVEMENT

5.1 PUBLIC INVOLVEMENT

5.1.1 Scoping

The South Florida Water Management District (SFWMD) prepared a feasibility study and environmental documentation (“study”) pursuant to Section 203(a)(1) of the Water Resources Development Act (WRDA) of 1986 (33 U.S.C. 2231(a)(1)), as amended. The SFWMD submitted this study on March 30, 2018 to the Assistant Secretary of the Army for Civil Works (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. This SFWMD request, if approved, would be a post authorization change to modify the Central Everglades Planning Project (CEPP), which was authorized as a Federal project by Congress in 2016. The Federal action of the ASA(CW) is to evaluate and report whether the project is feasible and provide any recommendations concerning the project design or conditions for construction to several congressional committees. Under Section 203 guidance, the U.S. Army Corps of Engineers is not involved in a non-Federal Interest’s process of the development of alternatives (in this case SFWMD is the non-Federal Interest). National Environmental Policy Act (NEPA) applies to the federal action that the ASA(CW) may take in response to the study. Therefore, the U.S. Army Corps of Engineers, Jacksonville District (Corps) prepared this Draft Environmental Impact Statement (EIS) in accordance with NEPA to evaluate and document effects on the human environment of the SFWMD Recommended Plan prepared under Section 203 in relation to the No Action Alternative, which is the authorized CEPP features. The SFWMD’s study has documented their consideration of the effects of their proposed activity on the human environment in a manner that was intended to be consistent with NEPA. Therefore, information from the SFWMD environmental analysis has been considered by the Corps and is being utilized for this NEPA preparation.

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) April 16, 2018. All comments received, along with a comment-response matrix are located in **Appendix C – Pertinent Correspondence**.

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 **SFWMD Section 203 Report, 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. This Draft EIS assesses the potential environmental effects on the human environment as they relate to the SFWMD Section 203 Preferred Alternative for the SFWMD Section 203 Everglades Agricultural Area (EAA) Southern Reservoir and Stormwater Treatment Area (STA) Project. 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, is located in the Pertinent Correspondence Appendix C. Comments and responses during the SFWMD scoping and planning process are located in the **SFWMD Section 203 Report (Annex A to this Draft EIS) Appendix C.3.**

5.1.3 Statement Recipients

Copies of the NEPA scoping letter and Notice of Availability (NOA) of the Draft 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 EIS was 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

Law, Policy and Regulations	Status	Comments
Anadromous Fish Conservation Act	In compliance with this Act.	Proposed action would not adversely affect anadromous fish species.
Archaeological Resources Protection Act of 1979	The recommended plan is in compliance with this act and will continue to comply throughout construction and operation.	Further investigations may be needed once the project is authorized and the Preconstruction, Engineering and Design (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.	Proposed action 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 any required National Pollutant Discharge Elimination System (NPDES) permits or permit modifications.	In accordance with the Clean Water Act, a Section 404(B)(1) Evaluation has been completed and is contained within Appendix D . A Comprehensive Everglades Restoration Plan Regulation Act (CERPRA) permit would be sought from the State of Florida for WQC. The Jacksonville District notes that the SFWMD Section 203 Report does not apply Department of Army water quality cost sharing policy.
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 Recommended Plan 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 draft EIS, the Corps will seek concurrence from the Florida State Clearinghouse that the project is consistent to the maximum extent	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 Recommended Plan is consistent to the maximum extent practicable with the enforceable policies of Florida's

Law, Policy and Regulations	Status	Comments
	practicable with Florida’s approved Coastal Zone Management.	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, and the State’s continued concurrence will be based on the activities’ continued compliance with FCMP authorities, including Federal and State monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and subsequent regulatory review.
Endangered Species Act of 1973	In progress. 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 work. The Corps also determined that the Recommended Plan May Affect Eastern indigo snake and Florida panther. A Biological Opinion from the FWS is anticipated on or before September 13, 2018. 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.	The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend. 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, which covers the Recommended Plan in this Draft EIS, 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 CEPP implementation.
Estuary Protection Act of 1968	In compliance with this Act.	The objectives of the Recommended Plan are focused on environmental protection. The Recommended Plan provides increased opportunities to redirect water that is currently discharged to the Caloosahatchee and St. Lucie Estuaries at undesirable times or in undesirable quantities 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.

Law, Policy and Regulations	Status	Comments
Federal Water Project Recreation Act/Land and Water Conservation Fund Act	In compliance with this Act.	Effects of proposed action on outdoor recreation have been considered in Section 4 . Proposed 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 National Environmental Policy Act (NEPA) and ESA processes to meet the intent of the Act. This project is in compliance.
Farmland Protection Policy Act of 1981	The Corps sent the NRCS Form AD 1006 on May 15, 2018 to begin consultation under the Act. The Recommended Plan will be in full compliance with the Act at the time of construction.	Coordination with the U.S. Department of Agriculture, Natural Resources Conservation Service (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 were sufficient and they did not have further comments after they reviewed the draft 2014 CEPP PIR/EIS (2014 CEPP PIR/EIS Appendix C.2.2.6 for EFH Assessment). The Recommended Plan would further reduce discharges to the Northern Estuaries, thereby providing potential benefits to EFH. The additional footprint of the A-2 parcel STA would not have an effect on EFH as it is currently leased for agriculture.
Marine Mammal Protection Act of 1972	The Recommended Plan is in compliance with this Act.	Project site and adjacent canals lie outside of the areas mapped as being accessible to Manatees, however, the Recommended Plan 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.	Proposed action does not consider ocean disposal of dredged material.
National Environmental Policy Act of 1969	In progress, the Recommended Plan 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 Notice of Availability for review of the draft EIS is planned to be released on June 8, 2018 for a 45 day public review period. Public meetings will be held late June. The Jacksonville District notes that additional NEPA may be required dependent upon any changes during design phase.
National Historic Preservation Act of 1966	The Recommended Plan is currently in compliance and will continue to meet the requirements of this Act throughout construction and operation.	Significant cultural resources are known to exist within the vicinity of the project area. Section 106 of the NHPA allows for a phased approach to compliance with the Act. Once the project is authorized and Preconstruction, Engineering, and Design is implemented, further investigations and consultation will be needed. Each suite of features will be consulted on as they

Law, Policy and Regulations	Status	Comments
		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.
Native American Graves Protection and Repatriation Act	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 SFWMD Section 203 study.	NAPGPRA 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.
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 Amendments and Reauthorization Act of 1996, Toxic Substances Control Act of 1976.	The SFWMD has completed a limited environmental assessment on the proposed project foot print. Previous and current activities conducted within the proposed project area are in compliance with the referenced acts. The SFWMD will continue to meet the requirements of these acts during the construction and operation.	Procedures would be implemented during the construction and operation to ensure compliance with the acts' requirements specifically those activities associated with hazardous and toxic chemical documentation, communication, handling, storage and disposal. In the event that any activities or materials that are regulated are discovered during the construction or operation of the project, appropriate actions would be taken.
Rivers and Harbors Act of 1899	In compliance with this Act.	The Recommended Plan would not obstruct navigable waters of the United States.
Submerged Lands of 1953	In compliance with the goals of this Act.	The Recommended Plan 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 Recommended Plan does not occur on submerged lands and no construction is expected on submerged lands.
Wild and Scenic River Act of 1968	This Act is not applicable.	No designated wild and scenic rivers are located within project area.
E.O. 11514, Protection of the Environment.	In compliance with this E.O	The objectives of the Recommended Plan 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 this proposed action includes state and Department of the Interior owned lands only.

Law, Policy and Regulations	Status	Comments
<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. Determine if the proposed action is in the base flood plain. – Yes, the proposed A-2 reservoir and STA is located in the base flood plain (Zone AE based on FEMA maps, October 2017, https://maps.co.palm-beach.fl.us/cwgis/?app=floodzones). https://maps.co.palm-beach.fl.us/cwgis/?app=floodzones).</p> <p>2. 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. – Since the development and authorization of the Comprehensive Everglades Restoration Plan (CERP) in 1999, reservoir storage in the EAA (Component G) has been an integral part of the plan for restoration of the Everglades ecosystem. For the authorized CEPP plan, the A-2 FEB was determined to be a necessary element of the restoration project. The change to an A-2 reservoir and STA to provide more storage and treatment for restoration purposes, in virtually the same location as the A-2 FEB, supports the conclusion that practicable alternatives to locating the storage and treatment facilities in the flood plain have been considered.</p> <p>3. If the action must be in the flood plain, advise the general public in the affected area and obtain their views and comments. – The SFWMD conducted extensive public scoping and outreach efforts during the development of the SFWMD Section 203 Planning Study. 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 SFWMD Section 203 Report, Section 7.1 of the main report and Appendix C.3 for details on public involvement efforts.</p> <p>4. 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. – The proposed modifications to 2014 CEPP addressed in the Recommended Plan 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 that has limited natural and beneficial flood plain values. Thus, the proposed changes to the authorized CEPP plan are expected to have little overall effect on natural flood plain values.</p> <p>5. 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. – The project modifications proposed in the CEPP PACR would be for ecosystem restoration purposes and is not expected to induce development in the base flood plain.</p>

Law, Policy and Regulations	Status	Comments
		<p>6. 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. – The “no action” alternative would involve construction of the A-2 FEB, as currently authorized in the 2014 CEPP plan. 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 Recommended Plan.</p> <p>7. 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. – The public has been advised of the proposed modifications addressed in this draft 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. Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order. – The proposed modifications to the authorized 2014 CEPP plan to provide additional storage and treatment in the EAA (a) is the only practicable alternative to achieve 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.</p>
E.O. 11990 Protection of Wetlands	In compliance with this E.O.	Areas proposed for restoration are currently used as agriculture. The objectives of the Recommended Plan are focused on environmental protection.
E.O. 12962, Recreational Fisheries	In compliance with this E.O.	The Recommended Plan 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 Recommended Plan does 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 provided an assessment that is located in Appendix C.2.2 of the Final CEPP PIR/EIS. No additional effects regarding environmental justice would be expected with the change from the A-2 FEB to

Law, Policy and Regulations	Status	Comments
		a reservoir and converting the A-2 parcel from leased agricultural lands to a 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	In compliance with this E.O.	The Recommended Plan 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.
E.O. 13089 Coral Reef Protection	This E.O. is not applicable	Coral reefs are not affected.
E.O. 13122 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 SFWMD Section 203 Report 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 Recommended Plan would not adversely affect migratory bird species. The Recommended Plan 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	This Act also involves an agreement known as the Water Rights Compact, which specifically defines tribal water rights.

5.3 COMPLIANCE WITH USACE CERP AGRICULTURAL CHEMICAL POLICY

The Corps Hazardous, Toxic and Radioactive Waste (HTRW) policy (Engineering 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 Assistant Secretary of the Army for Civil Works (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 **SFWMD Section 203 Report Appendix C.4**. If specific criteria are met, this policy memorandum allows residual agrichemicals 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 **SFWMD Section 203 Report Annex H**.

The Agricultural Chemical section of **SFWMD Section 203 Report Appendix C.2.2** of the SFWMD Section 203 Report 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 Jacksonville District 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 consistent with the Comment 2. However, the District 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 CESAJ 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 COMPLIANCE WITH FLORIDA STATUTES

The State of Florida has enacted several laws pertaining to implementation of CERP projects. These include amendments to Section 373.026 (8), Florida Statutes (F.S.), which establishes a requirement for the SFWMD to submit a report for review and approval by Florida Department of Environmental Protection (FDEP) prior to formal submission of a request for authorization from Congress and prior to receiving an appropriation of State funds for construction and other implementation activities (except the purchase of lands from willing sellers); the enactment of Section 373.1501 F.S., which establishes the intent of the Florida Legislature with respect to CERP and the criteria for FDEP approval and the

procedures to be followed by the SFWMD and FDEP for submitting and reviewing requests for approval; the enactment of Section 373.1502 F.S., which establishes permitting requirements and a process for the submittal, review, and issuance of certain regulatory permits for CERP projects; and the enactment of Section 373.470 and Section 373.472 F.S., establishing the “Save Our Everglades Trust Fund,” funding and reporting requirements, and procedures for distributions from the trust fund.

The SFWMD’s State Compliance Report addressing the criteria for approval listed in Section 373.1501 F.S. is included in the **SFWMD Section 203 Report, Annex B**. In addition to the above-described statutory requirements, other sections of Chapters 373 (Water Resources) and 403 (Environmental Control) of the F.S. include requirements that may apply to various aspects of CERP project planning and implementation. In particular, Chapter 403 F.S. and the administrative laws adopted in accordance with Chapters 373 and 403 F.S., contain the requirements for facilities that involve the discharge or potential discharge of pollutants to surface and groundwaters, and the discharge of air pollutants, including facilities regulated under the Federal Clean Water and Safe Drinking Water Acts and the Federal Clean Air Act. Based on the information contained in this PIR, the recommended plan complies with the applicable provisions of the F.S. A detailed explanation of how the project complies with the applicable requirements for CERP projects contained in the F.S. can be found in the **SFWMD Section 203 Report, Annex B**.

5.4.1 Permits, Entitlements and Certifications

The Corps will obtain WQC prior to advertising any construction contract. CWA Section 402 National Pollutant Discharge Elimination System (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. This program has been delegated by the U.S. Environmental Protection Agency for implementation to the State of Florida (FDEP). All required permits and/or modifications to existing permits would be acquired prior to construction activities.

5.5 ENVIRONMENTAL CONCERNS

The Assistant Secretary of the Army for Civil Works (ASA(CW)) will review the SFWMD recommended plan to determine whether the SFWMD complies with Federal law and regulation, to make a determination on the study’s feasibility, and to identify any conditions or recommendations. If the ASA(CW) determines that the SFWMD recommended plan is feasible, further engineering analysis of the SFWMD recommended plan will be required prior to or during the early activities of Pre-Construction, Engineering, and Design (PED) Phase to ensure compliance, including Engineering Regulation 1110-2-1156 and the CERP Design Criteria Memoranda (DCM).

- Additional water supply may be available for agricultural/municipal water supply with the SFWMD Preferred Alternative, 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 Report for details) due to the cost benefit ratio. Subsequently, the SFWMD, under Laws of Florida, Chapter 2017-10, was mandated to evaluate a reservoir in their Section 203 study, without screening the alternative for cost.

- The SFWMD Section 203 planning process was restricted with regard to lands under Laws of Florida, Chapter 2017-10, which prohibited the use of imminent domain. The Corps planning process would not include such constraints.
- During the PED phase, all appropriate RECOVER level reviews, would be completed consistent with the implementation phases, as necessary.

Water Quality

- The expected benefits from the Recommended Plan include improvements on the health of the Caloosahatchee and St. Lucie estuaries due to the reduced potential for undesirable discharges from Lake Okeechobee. However, there is a potential for slightly degraded water quality conditions in the new Lake Okeechobee water that would be discharged to WCA 3A if the STA features are undersized. A sensitivity model run regarding settling rates would need to be performed, with a settling rate of zero, for the reservoirs to ensure water quality standards would be achieved.
- STA bypasses should be avoided and further design may be required to meet water quality standards.

Tribal

- The Miccosukee Tribe have a Federal Reservation and leased lands within the northern portion of WCA 3A. Due to the proximity of the Recommended Plan 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 Standards of 10 parts per billion 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 Recommended Plan 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 Recommended Plan.

Engineering

The Engineering Appendix of the SFWMD report represents a limited level of design, but includes documentation of all engineering assumptions and conceptual designs. PED for CEPP features, as modified by the SFWMD recommended plan, could begin after Congressional authorization contingent upon ASA(CW) concurrence with the report and upon SFWMD’s concurrence consistent with the implementation phases. All work would be coordinated and reviewed between the USACE and the SFWMD, and approved by the USACE and SFWMD prior to construction, to ensure that the work meets USACE guidance, standards and regulations and incorporates, as applicable, SFWMD design guidance. PED would include 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. The results of these analyses during PED may result in design modifications and/or revisions to the project total cost.

The USACE will ensure compliance with all applicable USACE Engineering Regulations and design standards for dams prior to final approval of the impoundment design and prior to initiating construction. The following additional analyses are required to be conducted prior to or during early activities of the PED Phase in support of the engineering design:

- (1) 2-dimensional embankment seepage calculations 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 along with updated slope stability analyses;
- (3) Consequence and Potential Failure Mode Analysis, including evaluation of consequences for potential life loss, economic damages, and environmental damages (ER 1110-2-1156) 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.

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Table 6-1. List of SFWMD Section 203 NEPA Report Preparers and Reviewers1

6.0 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 CEPP Report Preparers and Reviewers**). The SWFMD did the plan formulation, extensive scoping meetings throughout their planning process, and wrote the feasibility study and environmental documentation that was heavily referenced and used within this Draft Environmental Impact Statement (EIS). The SFWMD list of preparers is located in the **SFWMD Section 203 Report, Section 9, Annex A**.

Table 6-1. List of Corps' Preparers and Reviewers for the Draft EIS in response to the SFWMD Section 203 Report

Name	Role in Document Preparation
Stacie Auvenshine	NEPA Preparation
Andy LoSchiavo	NEPA Review
Melissa Nasuti	NEPA Review
Gina Ralph	NEPA Preparation and Review
Marcy Jackson	NEPA Preparation, Tribal Consultation
Chrissie Wiederhold	NEPA Review
Dan Crawford	NEPA Review
Murika Davis	NEPA Review
Jim Riley	Water Quality Preparation and Review
Meredith Moreno	Cultural Resources Preparation, Consultation, and Review

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9.0 GLOSSARY OF ACRONYMS AND TERMS

9.1 LIST OF ACRONYMS

A

ac-ft	acre-feet
AM	Adaptive Management
ASA(CW)	Assistant Secretary of the Army for Civil Works

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 ₂	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
ENP	Everglades National Park
E.O.	Executive Order
EQ	Environmental Quality
ER	Engineering Regulation
EPA	Everglades Protection Area
ERTP	Everglades Restoration Transition Plan
ESA	Endangered Species Act
EWMA	Everglades Wildlife Management Area
F	
F.A.C.	Florida Administrative Code
FAR	Florida Administrative Register
FB-EC	Florida Bay East Coast
FDEP	Florida Department of Environmental Protection
FEB	Flow Equalization Basin
F.S.	Federal Statute
FS/DEIS	Feasibility Study/Draft Environmental Impact Statement
ft	feet
FWC	Florida Fish and Wildlife Conservation Commission
FWCA	Fish and Wildlife Coordination Act
FWO	Future Without (Project Condition)

FY	Fiscal Year
G	
GDM	General Design Memorandum
GRR	General Reevaluation Report
H	
HHD	Herbert Hoover Dike
HQUSACE	USACE Headquarters
HTRW	Hazardous, Toxic and Radioactive Waste
HU	habitat unit
I	
IDC	interest during construction
IEPR	Independent External Peer Review
IG	Interim Goal
IOP	Interim Operations Plan
IR	Indicator Region
IRL	Indian River Lagoon
IRL-S	Indian River Lagoon-South (Project)
IWR	Institute for Water Resources
J	
K	
L	
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
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
RED	Regional Economic Development
RESOPS	Reservoir Sizing Operations Screening Model
ROM	rough order of magnitude
RPM	reasonable and prudent measure
RSM	Regional Simulation Model
RSM-BN	Regional Simulation Model for Basins
RSM-GL	Regional Simulation Model for the Glades and Lower East Coast Service Area
S	
S&A	supervision and administration
SAD	South Atlantic Division (USACE)
SAJ	Jacksonville District (USACE)
SAV	submerged aquatic vegetation
SDCS	South Dade Conveyance System
FWMD	South Florida Water Management District
FWMM	South Florida Water Management Model
SHPO	State Historic Preservation Office(er)
SLE	St. Lucie Estuary

SLR	Sea Level Rise
SMA	Square Mile Area
SPF	Standard Project Flood
SRS	Shark River Slough
STA	stormwater treatment area
T	
TC	terms and conditions
THPO	Tribal Historic Preservation Office(er)
TMDL	Total Maximum Daily Limit
TOC	Technical Oversight Committee
TP	Total Phosphorus
TSP	Tentatively Selected Plan
TTNS	Tamiami Trail Modifications Next Steps
U	
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	
W	
WCA	Water Conservation Area
WERP	Western Everglades Restoration Project
WIIN Act	Water Infrastructure Investments for the Nation Act of 2016
WPA	Water Preserve Areas
WPB	West Palm Beach
WQBELs	Water Quality-Based Effluent Limits
WQC	Water Quality Certification
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

Acres — 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.

Acres-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 above ground 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 utilize 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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