

South Florida Water Management District



EVERGLADES STORMWATER TREATMENT

AREAS

Pollution Prevention Plan

November 2011

Submitted in accordance with the Everglades Forever Act,
§373.4592, Fla. Stat., and the State of Florida's
National Pollutant Discharge Elimination System Program,
§403.0885, Fla. Stat.



I. BACKGROUND

The South Florida Water Management District (District), in accordance with the 1994 Everglades Forever Act (EFA), §373.4592, Florida Statutes (F.S.), and an agreement with the federal government, has implemented the Everglades Construction Project (ECP) in an effort to restore the quality of the water entering the Everglades Protection Area (EPA). The original ECP consisted of the construction of six Stormwater Treatment Areas (STAs) or treatment marshes which use natural physical, chemical, and biological processes to remove excess nutrients, including total phosphorus (TP), from stormwater runoff and other sources prior to discharge into the EPA. Subsequent to the completion of the original six ECP STAs, it was determined that additional STA acreage would be needed to achieve the long-term water quality goals of the EFA. As a result, it was determined that available land in Compartments B and C would be used to construct STA expansions to assist the existing STAs in improving water quality entering the EPA. STA-1E, STA-1W, STA-2 (including Compartment B), STA-3/4, STA-5, and STA-6 (including Compartment C) are the subject of this Pollution Prevention Plan (PPP).

STA-1E was constructed under the direction of the U.S. Army Corps of Engineers (USACE) and is located immediately south of the C-51 Canal, immediately east of the STA-1 Inflow Basin and adjacent to the northeastern corner of the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge). STA-1E consists of about 5,100 acres. A total of about 4,000 acres, consisting of the Western Flow-way (Cells 5, 6 & 7) and Central Flow-way (Cells 3, 4N & 4S), began operation in 2005. The Eastern Flow-way (Cells 1 & 2) has been under the control of the USACE to facilitate operation of a Periphyton Stormwater Treatment Area (PSTA) Field-Scale Demonstration Project in Cell 2, construction of which was completed in October 2006.

STA-1W, located immediately west of the STA-1 Inflow Basin adjacent to the northwest corner of the Refuge, consists of about 7,000 acres and began operation in 2000. STA-1W and STA-1E treatment facilities are interrelated and hydrologically connected via the STA-1 Inflow Basin, and are operated in concert with each other.

STA-2, situated on and surrounding lands formerly known as the Browns Farm Wildlife Management Area, originally consisted of about 6,800 acres and began operation in 2000. An approximate 2,000-acre expansion (Cell 4) was constructed in 2006 on a portion of Compartment B. An additional expansion of STA-2 constructed on the remaining portion of Compartment B, consisting of Cells 5-8, was completed in 2010 bringing the total STA-2 area to approximately 16,000 acres.

STA-3/4, located adjacent to the Holey Land Wildlife Management Area, consists of about 16,500 acres and began operation in 2004.

STA-5 is located adjacent to the northwest corner of the Rotenberger Wildlife Management Area (RWMA), and STA-6, is located adjacent to the southwest corner of



the RWMA. The original STA-5 consisted of about 4,100 acres and began operation in Water Year 2000. The original STA-6 consisted of about 870 acres and began operation in 1997. STA-5 was expanded by approximately 2,000 acres on a portion of Compartment C. This initial expansion was flow-capable in December 2006, bringing the total area for STA-5 to approximately 6,100 acres. STA-6 was also expanded in 2006 by about 1,400 acres, referred to as STA-6 Section 2, bringing the total area for STA-6 to approximately 2,300 acres. An additional expansion of STA-5 and STA-6 constructed on the remaining portion of Compartment C was completed in 2010 bringing the total STA-5/STA-6 area to approximately 13,000 acres.

The District, in accordance with the Everglades Forever Act (EFA), §373.4592(10), Fla. Stat., has implemented operational, structural, and vegetation enhancements to the STAs in an effort to restore the quality of the water entering the EPA. Additional enhancements to the STAs may occur through on-going adaptive implementation.

II. MISSION STATEMENT

The District mission is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems and water supply. The District recognizes that stormwater runoff from the Western C-51 Basin, Everglades Agricultural Area (EAA) (within the S-5A, S-6/S-2, S-7/S-2 and S-8/S-3 Basins), the C-139 Basin, and other sources contain excessive levels of phosphorus.

The District also recognizes the long-term need to improve the timing, distribution and volume of inflow (collectively referred to as hydropattern) along the over drained northwest portions of Water Conservation Area 2A (WCA-2A) and WCA-3A. In addition, localized water quality problems in Lake Okeechobee associated with discharges from special drainage districts adjacent to the Lake can be reduced by diverting approximately 80% of these discharges for treatment in the ECP STAs.

III. PURPOSE

This PPP provides a summary of normal operations for the STAs, and describes factors which may impact those operations. The STAs shall be operated in accordance with this document to achieve the design objectives of the ECP for phosphorus and reduce adverse impacts to downstream water quality conditions in the EPA. This PPP is based upon information from:

1. Conceptual Design Document for the Everglades Protection Project, Burns & McDonnell, February 15, 1994
2. General Design Document (GDM) for STA-1, Burns & McDonnell, August 1995
3. Design Document Report, Canal 51 and Stormwater Treatment Area 1 East, U.S. Army Corps of Engineers, January 1999



4. C-51 and STA-1 East, Design Document Report, U.S. Army Corps of Engineers, October 1999 (revised DDR)
5. Revised Draft STA-1E Detailed Design Report, U.S. Army Corps of Engineers, May 2000
6. Redesign of the G-311 Inflow and Distribution Channel, SFWMD, February 2004
7. General, Detailed and Supplement to the Detailed Design documents for STA-1W, dated August 1995, June 5, 1996 and June 19, 1997, respectively, Hutcheon Engineers
8. General Design Memorandum for Stormwater Treatment Area No. 2 and WCA-2A Hydropattern Restoration, Burns & McDonnell, April 1995
9. General Design Report for STA-2, Brown and Caldwell, January 1996
10. Final Design, Stormwater Treatment Area-2 and WCA-2A Hydropattern Restoration, Brown and Caldwell, May 1997
11. STA-2 Cell 4 Expansion Project Basis of Design Report, Brown and Caldwell, May 2005.
12. Design Package 3 - 90% Design Report STA-2 Cell 4, Brown and Caldwell?, September 2005
13. Hydraulic Modeling Technical Memorandum for STA-2 Cell 4 Expansion, Brown and Caldwell, December 2005
14. Hydraulic Modeling of The Internal Works, Brown and Caldwell, October 2005
15. Compartment B Build-out Basis of Design Report, Brown and Caldwell, 2007
16. General Design Memorandum for Stormwater Treatment Area No. 3/4 and East WCA-3A Hydropattern Restoration, Burns & McDonnell, November 1995
17. STA-3/4 Plan Formulation, Burns & McDonnell, July 2000
18. STA-3/4 Design Criteria, Burns & McDonnell, August 2000
19. STA-3/4 Plan Implementation document, Burns & McDonnell, August 2000
20. General Design Memorandum for STAs 5 and 6, Burns & McDonnell, July 1996
21. Final Design Report for STA-5 Works, Burns & McDonnell, September 1997
22. Draft document STA-5 Assessment of Operational Impacts, Burns & McDonnell, December 1999
23. C-139 Basin Water Quality Monitoring Program
24. Basis Of Design Report STA-5 Flow-way 3, URS, January 2006
25. Basis of Design Report STA-6 Section 2, URS, January 2006
26. Hydraulic Modeling and Water Quality Performance Assessments for STA5/6 Expansion, URS, January 2006
27. Everglades Agricultural Area Regional Feasibility Study, ADA/Burns & McDonnell, October 2005
28. Draft Hydrologic and Hydraulic Analysis of Compartment C Build-out for the STA-5 and STA-6 System, URS June 2007
29. STA-5/6 Operational Plan Update Technical Memorandum, URS, July 2007
30. Integrated Operation Plan for STA-5 and STA-6, Gary Goforth, Inc., 2008?
31. Updated Flow and Phosphorus Data Sets for ECP Basins, Gary Goforth, Inc., 2007 and 2009
32. EAA STA Compartment C Buildout STA Basis of Design Report, URS, 2007
33. EAA STA Compartment C Buildout STA Preliminary Design Report, URS, 2008



34. EAA STA Compartment C Buildout STA Intermediate Design Report, URS, 2008
35. Everglades Protection Area Tributary Basins Long-Term Plan for Achieving Water Quality Goals, Burns and McDonnell, 2003, and approved revisions 2004-2011
36. Rule 40E-63 of the Florida Administrative Code
37. Operational experience from the existing STAs summarized in the annual South Florida Environmental Reports and its predecessor the Everglades Consolidated Reports
38. Pandion Systems, Inc., September 2008. Avian Protection Plan for Black-necked Stilts and Burrowing Owls Nesting in the Everglades Agricultural Area Stormwater Treatment Areas. Prepared for the South Florida Water Management District

By operating in accordance with these documents, past operational experience and the continued implementation of STA optimization activities, the objectives of the ECP for phosphorus will be achieved, in accordance with the EFA, §373.4592(10)(a)(b), Fla. Stat.

Each STA is a dynamic system, subject to variation in rainfall, hydraulic and nutrient loading, inflow water quality and interior vegetative conditions. As a result, this PPP is only intended to provide an understanding of the range of conditions under which the STAs have been and shall continue to be operated under. This document is NOT intended to reflect absolute limitations upon operation of each STA; instead, system operation will at all times require District operating personnel to exercise their Best Professional Judgment based upon existing regional and on-site conditions and data available at the time.

While this document characterizes the operational expectations for each STA, it also recognizes that operation may fluctuate outside of these predefined ranges. For example, extreme storm events could result in inflows to the STA which exceed the system's hydraulic and treatment capacity. As a result, the PPP describes measures that may be taken by operators in order to minimize adverse impacts that could occur upstream, within and downstream of the STA under those circumstances.

IV. OBJECTIVES

The STAs have been and shall continue to be operated in a manner that balances the water quality, flood control and water supply purposes and adapts to future changes in the regional water management system. The primary objectives of the STAs include the following:

A. REDUCE PHOSPHORUS LEVELS TO ACHIEVE COMPLIANCE WITH STATE WATER QUALITY STANDARDS INCLUDING THE PHOSPHORUS CRITERION IN THE EVERGLADES PROTECTION AREA

Working in combination with the implementation of best management practices in the contributing watersheds, the STAs are designed to reduce phosphorus levels in



stormwater runoff to ensure that all waters in the EPA achieve compliance with water quality standards including the phosphorus criterion established in Rule 62-302.540 of the Florida Administrative Code (F.A.C.).

B. IMPROVE WATER QUANTITY ENTERING THE EPA

The STAs will be operated, to the maximum extent practicable, to increase the quantity of water delivered to the EPA through redirection of runoff from the Western C-51, East Beach Drainage District, East Shore Water Control District, Closter Farms, South Shore Drainage District, and the South Florida Conservancy District. Redirection of runoff from these basins to the EPA will also improve water quality conditions in the areas that received this runoff prior to the implementation of the ECP.

C. PROVIDE FLOOD PROTECTION FOR THE UPSTREAM BASINS

The STAs will be operated, to the maximum extent practicable, to provide flood protection for the upstream contributing basins, including the EAA, C-139, Acme Basin B, Rustic Ranches, Chapter 298 District Diversions described in “F.” below, and Western C-51 Basin. STA-1E and STA-1W will also be operated to the maximum extent practicable to provide flood protection for the L-8 Basin until the Loxahatchee River Watershed Protection Project is completed.

D. REDUCE LOCALIZED WATER QUALITY PROBLEMS IN LAKE OKEECHOBEE

The STAs will be operated, to the maximum extent practicable, to provide water quality treatment for diversions from East Beach Drainage District, East Shore Water Control District, Closter Farms, South Shore Drainage District, and the South Florida Conservancy District. Once treated, discharges from these basins will be discharged to the EPA. Prior to the implementation of the ECP, these areas discharged to Lake Okeechobee.

V. ACTION PLAN

The District intends to operate the STAs in compliance with the EFA, §373.4592(10), Fla. Stat. The District shall operate the STAs within the normal operational guidelines established in subsection (A), below. However, the STAs and the ECP were not designed to operate under all possible conditions. For example, extreme storm events could create conditions that would necessitate the District to partially divert flows around the STA treatment system in order to prevent damage to the structural and vegetative integrity and prevent upstream flooding. *See, Miccosukee Tribe of Indians v. South Florida Water Management District*, Fla. DEP Case No. 96-1851, Final Order, Finding of Fact Number 23, (April 21, 1998). Accordingly, subsection (B) describes circumstances requiring deviation from those normal operational guidelines. Subsection (C) describes the *Operations* period for STA-1E and STA-1W prior to the implementation of the L-8 Basin



diversion and during which the USACE will be decommissioning the PSTA Demonstration Project in STA-1E Cell 2 and completing other repairs throughout STA-E.

A. STA NORMAL OPERATIONAL GUIDELINES

As stated in section (IV) above, the STAs have been and shall continue to be operated in a manner that balances the water quality, flood control and water supply purposes and adapts to future changes in the regional water management system. These objectives are expected to be achieved by operating the STAs in accordance with the following guidelines:

1. STA Source Inflow and Phosphorus Load Variations

The anticipated average annual inflow volumes for each of the STAs are based on long-term rainfall and runoff datasets, however, during normal operations, annual inflow volumes are anticipated to fluctuate in response to variations in upstream rainfall. During normal project operations, the inflow loads to the STAs are expected to fluctuate with variations in inflow volumes.

2. Inflow and Outflow Structure Capacities for each STA

Table 4. Upstream Delivery Features and Inflow/Outflow Structure Capacities for each STA (these reflect maximum flow capacities for the structures; actual STA operations are typically less than the structure design capacities).

	Inflow or Outflow	Structure	Design Capacity (cfs)
STA-1E*	Upstream	S-319	3,980
	Upstream	G-311	1,550
	Upstream	S-361	75
	Outflow	S-362	4,200
STA-1W*	Inflow	G-302	3,250
	Outflow	G-251	450
	Outflow	G-310	3,040
STA-2	Upstream	S-6	2,925
	Upstream	G-328	444
	Upstream	G-434	1,120
	Upstream	G-435	480
	Outflow	G-335	3,040
	Outflow	G-436	1,600
STA3/4	Upstream	G-370	2,775
	Upstream	G-372	3,700
	Outflow	G-376A-F	2,172
	Outflow	G-379A-E	1,980
	Outflow	G-381A-F	1,692
STA-5/6	Inflow	G-342A-B	600



	Inflow	G-342C-D	600
	Upstream	G-508	1,630
	Inflow	G-342G-H	600
	Inflow	G-342I-J	600
	Inflow	G-342L-M	900
	Inflow	G-342N	600
	Inflow	G-353A-B	286
	Inflow	G-353C	105
	Outflow	G-344A-B	600
	Outflow	G-344C-D	600
	Outflow	G-344E-F	600
	Outflow	G-344G-H	600
	Outflow	G-344I-K	900
	Outflow	G-352A-C	669
	Outflow	G-354A-C	360
	Outflow	G-393A-C	140

*STA-1E and STA-1W were developed to take advantage of the difference in timing of runoff events from the S-5A and C-51 West Basins. The combined STA-1W/STA-1E designs reduce the required individual capacities of the primary hydraulic components of the treatment facilities compared to operating two independent STAs.

3. Anticipated BMP Performance

The EAA BMP regulatory program requires a minimum 25% TP load reduction from baseline historical EAA discharge loads, adjusted for hydrologic variability. The average phosphorus reduction from the implementation of BMPs over the program's 16-year history (WY1996-2011) is 55 percent, more than twice the amount required by law.

4. Anticipated Vegetative Conditions

During normal project operation, the District shall manage interior water levels to maintain marsh vegetation within the treatment system in productive condition. Cattail and other emergent plants have been the dominant vegetation generally within the upstream treatment cells and submerged aquatic vegetation has generally been the dominant vegetation in the downstream treatment cells. The percentages of vegetative coverage will fluctuate in response to variations in climatic, biological and inflow water quality and quantity conditions, as well as regularly scheduled vegetation management activities.

5. Operating Levels

Subject to water availability, during normal project operation the minimum target operating level for the STAs is 0.5 feet above average ground elevation. The maximum



operating level for the STAs during normal project operations is 4.0 feet above average ground elevation. In general, treatment cells are targeted to be maintained between flow events at approximately 1.25 ft – 2.0 ft above the average ground elevation. During periods of anticipated drought, target stages in some treatment cells may be temporarily increased with the goal of conserving water prior to the onset of the dry season. NOTE: The perimeter or exterior levees have been designed and constructed to provide for adequate freeboard to maintain levee structural integrity and to withstand the effects of severe rainfall events, wind setup and wave action.

6. Preventive Maintenance

Preventive maintenance of the STA project features may be required on a routine basis to avert severe property damage, maintain upstream flood protection and ensure continued functionality and efficiency of the conveyance and treatment systems. During preventive maintenance, individual treatment cells may be temporarily taken off-line and/or water levels within treatment cells may be adjusted through operations of various project structures. To minimize the impacts to operation during times of preventive maintenance, the District shall lower stages to minimal levels and/or take treatment cells off-line independently for as short a period of time as necessary to complete maintenance activities. Specific maintenance activities will include:

a. Water Control Structure Maintenance

The STA pump stations will require limited maintenance operation, because failure to operate these pumps could lead to premature breakdown and loss of manufacturer's warranty. Based on these mechanical requirements, the District will periodically operate the STA pump stations for approximately 2 to 4 hours per month, as necessary, to fulfill manufacturers requirements and maintain their mechanical integrity. The District shall operate the STA outflow pump stations accordingly to maintain water levels in the discharge collection canal. All maintenance discharges will be reported in accordance with the monitoring requirements of the permit(s).

The District shall also maintain other project water control structures to ensure that culverts and risers are conveying prescribed volumes and that gated weirs are functioning properly. Similarly, the District shall service pump stations routinely to ensure that pumps are functioning properly and not leaking contaminants into upstream or downstream waters.

b. Levee and Canal Maintenance

The District conducts semi-annual inspections to insure continued integrity and functionality of above ground dikes/levees, canals and structures, including pump stations in response to rapid changes in flow rates, high water stages, normal wear and tear, or any other factor which could cause levee and/or canal destabilization. All repairs and



maintenance activities are reported on a semi-annual basis. Activities include the routine maintenance of cover vegetation through regular mowing and/or appropriate use of herbicides. Project canals are maintained via periodic dredging, as needed to restore water conveyance and depths to design criteria.

c. Vegetative Maintenance

The District shall control invasive and/or exotic plant species through periodic use of approved herbicides both inside the treatment system and along the project perimeter. Vegetative maintenance shall also include physical removal of excess vegetation at inflow, outflow and interior locations to ensure adequate conveyance.

B. DEVIATION FROM NORMAL OPERATIONAL GUIDELINES

Under some circumstances, operation of the STAs may deviate from normal operation guidelines to prevent severe property damage. Under circumstances which could result in substantial physical damage to the treatment facility, including those defined below, the District shall take measures to minimize adverse impacts both within and downstream of the treatment area, and to avoid continued deviations from the normal operation of the STAs.

1. Excessive Rainfall or Flooding Conditions

When waters at the interior of the treatment cells reach critical depths, or an oncoming storm event is expected to cause interior waters to approach or exceed these depths or when project water control structures become inoperable, the District may redirect or divert the STA treatment cells (through the structures shown in Table 5) as described below.

a. Maximum Stage Elevations.

When waters at interior structures within an STA reach stage elevations at a depth of 4.0 feet, or

b. Threats to Structural Integrity

When stage elevations of waters or the rates of inflows threaten the structural integrity of the interior and exterior project levees; or

c. Threats to Vegetative Survival and Treatment Efficiency

When stage elevations of waters, rates of inflows, or the duration of sustained inundation creates conditions threatening the survival of marsh vegetation and the treatment efficiency of the project; or



d. Inflow Pump Stations

In the unforeseeable event that an STA inflow pump station would become inoperable or when the rate of inflows reaches the structure’s capacity, the District may divert some or all of the pump station’s inflow through the appropriate structure(s) shown in Table 5.

Table 5. STA Diversion Structure Capacities

	Structure	Design Capacity (cfs)	Receiving Water
STA-1E	G-300	1,920*	L-40 Canal (Refuge)
STA-1W	G-301	2,880*	L-7 Canal (Refuge)
	S-155A	1,500	C-51East Canal
STA-2	G-338	975	L-39 (Refuge)
	G-339	2,000	L-6 Canal (WCA-2A)
STA-3/4	G-371	2,170	L-18 (North New River Canal) Upstream of S-7 Pump Station
	G-373	2,000	L-23 (Miami Canal) upstream of S-8 Pump Station
STA-5/STA-6	G-406	1,770	L-3 Canal upstream of G-407
	G-407	2,000	L-3 Canal upstream of L-4 Canal

*Reference STA-1E Operation Plan, 2009

2. Emergency Discharges

The District shall discharge water from the STAs in accordance with Section 373.439, F.S., including when water conditions within an STA may damage existing marsh vegetation. The District shall notify the Florida Department of Environmental Protection (Department) within 48 hours of such an occurrence. Such notification shall contain information regarding the circumstances related to the discharge, as well as a projection regarding the anticipated duration of the discharge. In the event any such discharge extends beyond the period specified in the original notification, the District shall notify the Department within 48 hours of the continuation of the discharge, and such notice shall contain additional information regarding the circumstances causing the need for the discharge.

3. Drought Conditions

In order to preserve the continued viability of the marsh vegetation within the STA treatment cells, the District shall maintain a minimal static water level of 0.5 feet above average interior ground elevation to the maximum extent practicable. The District’s ability to maintain this minimum water elevation is determined primarily by the availability of water from rainfall within the project and the upstream watershed. In the event of severe drought conditions, the emergent treatment cells will be maintained to 0.5 feet below average ground elevation, while SAV cells will be maintained at 0.5 feet



above average ground elevation, both subject to availability of water. During periods of anticipated drought, target stages in some treatment cells may be temporarily increased with the goal of conserving water prior to the onset of the dry season.

4. Vegetative Conditions

Deviation from normal operation may be caused or necessitated by vegetative conditions as follows:

a. Failure to Achieve Performance Criteria

If an STA is unable to achieve its performance objectives, the District shall provide the Department with the following information:

- A. A description of and cause of inability to achieve performance objectives; and
- B. The time period the non-performance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the causes.

In the event that an STA project fails to achieve specified performance criteria, and vegetative composition is suspected to be a potential factor, the District may modify operations as necessary in order to respond to undesirable vegetative conditions.

5. Migratory Bird Nesting and Associated Protective Measures

Deviation from normal operation guidelines may be caused or necessitated by nesting in the STAs of migratory birds protected under the Migratory Bird Treaty Act. Mortality reduction measures have been identified and are followed as described in the District's "Avian Protection Plan for Black-Necked Stilts and Burrowing Owls Nesting in the Everglades Agricultural Area Stormwater Treatment Areas," however, these measures cannot completely prevent nesting. The Avian Protection Plan acknowledges the primary purpose of the STAs to improve water quality, and seeks to minimize mortality as opposed to prohibiting nest impacts in operating the STAs. However, there is a clear expectation that all operational flexibility will be explored and pursued in protecting nests from flooding. The District must exercise due diligence in monitoring the existence of nests, operating to minimize or avoid impacts, and fully document operational decisions where impacts are unavoidable.



C. OPERATIONS FOR STA-1E AND STA-1W PRIOR TO IMPLEMENTATION OF THE LOXAHATCHEE RIVER WATERSHED PROTECTION PROJECT, THE DECOMMISSIONING OF THE USACE'S STA-1E PSTA PROJECT, AND THE CORRECTION OF STA-1E STRUCTURAL DEFICIENCIES

1. Background

Until the L-8 Basin runoff is fully diverted, the decommissioning of the USACE's STA-1E PSTA project is complete, and structural deficiencies throughout STA-1E have been corrected, STA-1W and STA-1E will be operated in an adaptive manner that balances the water quality, flood control and water supply purposes of STA-1W and STA-1E. Regional operations will be going through a transition period until these efforts are completed, and it is intended that this *Pollution Prevention Plan* will be reviewed and updated periodically as these major activities are completed.

1. The design of STA-1E and STA-1W, which were designed together to treat runoff from the S-5A and C-51 West Basins, anticipated the construction of other facilities for the L-8 basin that would in effect divert the water away from STA-1E, STA-1W, the Refuge and the C-51 Canal. Additionally, this runoff will be available for environmental restoration purposes or water supply. L-8 Basin runoff can also enter the C-51W Canal via the Royal Palm Beach M1 Canal pursuant to the 1997 Memorandum of Agreement with Indian Trails Improvement District. This agreement allows for off peak discharges to C-51W.
2. STA-1E Eastern Flow-way (Cells 1 and 2) is under the control of the USACE due to the construction, operation and ultimate disposition of a Periphyton-based STA (PSTA) Demonstration Project. In September 2011, USACE Colonel Pantano released a "Proposed Finding of No Significant Impact - Decommission of Field Scale Periphyton Stormwater Treatment Area Demonstration Project" based on information analyzed and presented in an Environmental Assessment. The USACE's Preferred Alternative consists of removal of the PSTA project levees and structures; excavated material would be placed in low areas in Cell 2 to prevent short-circuiting. The USACE's Preferred Alternative has an estimated completion date of 2013. Until the USACE has completed the decommissioning of the PSTA Demonstration Project, flows through the Eastern Flow-way will continue to be reduced compared to the full design capacity.



3. Since completion in 2005, STA-1E has experienced several problems that have affected its performance. Additional modifications to STA-1E are currently proposed by the USACE to address design deficiencies as follows:

- Repair of 41 culverts throughout STA-1E is anticipated to be completed in 2017.
- The pump station trash rakes systems do not function as designed and require replacement of major components. Construction for this action is anticipated to be completed in 2013.
- Cells 5 and 7 are on average too deep respectively in relation to the design elevation. The resulting water depths have impacted that establishment of desirable emergent vegetation. Recommended solutions potentially include filling and grading Cells 5 and 7 to the desired elevation. This work may potentially impact STA operations, as portions of the affected flow paths may have to be taken off-line during construction to efficiently perform the required work. Construction for this action is anticipated to be completed in 2014.

2. Mitigating Increases in Phosphorus Loads or Concentrations During the Operations Period Prior to Implementation of the Loxahatchee River Watershed Protection Project, the Decommissioning of the USACE's STA-1E PSTA PROJECT, and the Correction of STA-1E Structural Deficiencies.

In order to optimize reductions in phosphorus to the Refuge and the EPA during the interim period, the District shall, to the maximum extent practicable and to the extent consistent with its responsibilities as the local sponsor of the C&SF Project:

1. Reduce phosphorus loading to the Refuge and the EPA compared to 1979-1988 base period;
2. Optimize the quantity of waters sent through the STAs, subject to their hydraulic, structural and biologic design limitations.

3. Conclusions.

The District is committed to achieving the performance measures of the Settlement Agreement and the design objectives of the ECP, and ultimately, the restoration of the Everglades. During the interim period, the District is further committed to optimizing the treatment of phosphorus in the watershed. The above proposal reflects the District's best efforts to achieve those interim and long-term objectives.



D. STA OPTIMIZATION

Optimization of the treatment wetland is defined by its performance at removing the pollutants, particularly phosphorus, for which the project was designed. The District conducts STA optimization research activities designed to enhance STA performance. Based upon the results of these and other research efforts, the operation and maintenance of the STAs may be periodically adjusted to optimize treatment efficiency of the project, in accordance with the EFA, §373.4592(9)(j)3., Fla. Stat.

VI. COMMITMENT TO WATER QUALITY IMPROVEMENT

A. COMPLIANCE WITH WATER QUALITY STANDARDS

The District is committed to the implementation of its responsibilities pursuant to the EFA, §373.4592, Fla. Stat., and its agreements with the federal government. Water quality conditions both upstream and downstream of the STAs will be monitored through a series of programs, including the Best Management Practices permit programs required by Rule 40E-63, F.A.C., the Non-Everglades Construction Project (Non-ECP) Basins Program (formerly known as the Everglades Stormwater Program) required by Florida DEP permit no. 02307803-010, and the operational permits for the STAs. Each STA shall be operated in accordance with this document to reduce adverse impacts to downstream water quality conditions in the EPA.

B. EMERGENCY SUSPENSION AND RESCHEDULING OF SAMPLING

Under hurricane, tropical storm warnings, or other extreme weather conditions, the District's normal water quality sampling schedule may be suspended and rescheduled, as necessary. The District shall notify the Department's Southeast District and the Water Quality Standards and Special Projects Program section at the addresses and telephone numbers listed in each STA permit, of any anticipated sampling suspension or rescheduling associated with hurricanes, tropical storms, or other extreme weather events that may require deviation from the normal sampling schedule. The District shall resume the normal sampling schedule as soon as possible. Within 14 days following the cessation of emergency conditions, the District shall notify the Department of when normal sampling is expected to resume.

VII. POLLUTION PREVENTION TEAM

Numerous District personnel will be responsible for the management of the STAs during the operational phase including: Tommy Strowd and the staff of the Operations, Maintenance and Construction Division; Ernie Barnett and the staff of the Office of Everglades Policy and Coordination; Terrie Bates and the staff of the Water Resources Division; and Kirk Burns of the Office of Counsel. The permit administrators for the



STAs are Deborah Drum and Holly Andreotta of the Office of Everglades Policy and Coordination.

VIII. BASELINE CONDITIONS

A great deal of data and documents which include pre-ECP STA water quality information for the Refuge have been previously completed and widely distributed. The District provided historical data to the Department during the EFA and NPDES permit application process. Documents that have been widely circulated to the Department and others include but are not limited to: *Water Quality Criteria in the Everglades Protection Area*, SFWMD (Bechtel, Krupa, Hill, Xue), May 1996, *the Everglades Nutrient Removal Project Annual Monitoring Report*, SFWMD, 1995, 1996 and 1997, and *the Everglades Consolidated Report, SFWMD, 2000, 2001, 2002, 2003 and 2004 and the South Florida Environmental Report, 2005 through 2011*.