UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

UNITED STATES OF AMERICA, et al.,

Plaintiffs,

vs.

CASE NO. 88-1886-CIV-HOEVELER

SOUTH FLORIDA WATER MANAGEMENT DISTRICT; TIMER E. POWERS, Interim Executive Director, South Florida Water Management District; FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION; and CAROL M. BROWNER, Secretary, Florida Department of Environmental Regulation, et al.,

Defendants.

_____/

SETTLEMENT AGREEMENT

WHEREAS the United States, the South Florida Water Management District and Timer E. Powers in his official capacity as Interim Executive Director of the South Florida Water Management District; and the Florida Department of Environmental Regulation and Carol M. Browner in her official capacity as Secretary of the Florida Department of Environmental Regulation, desire to restore, preserve and protect the unique flora and fauna of the Everglades National Park and the Arthur R. Marshall Loxahatchee National Wildlife Refuge, to maintain a cooperative relationship in accomplishing these goals, and to settle and resolve the disputes that have arisen between and among them without admitting or conceding liability;

EXHIBIT B

THEREFORE, the United States, the South Florida Water Management District and Timer E. Powers, and the Florida Department of Environmental Regulation and Carol M. Browner mutually stipulate and agree as follows:

DEFINITIONS

1. The following definitions shall apply to this Settlement Agreement ("Agreement") and the attached Appendices:

A. "Class III water quality standards" shall have the meaning set forth in Florida Administrative Code Chapter 17-302.

B. "The DER" **and "The DEP"** shall mean the Florida Department of Environmental **Protection, and its predecessor, the Florida Department of Environmental** Regulation.

C. "The District" shall mean the South Florida Water Management District.

D. "The Everglades Agricultural Area" ("EAA") shall mean that area including, but not limited to, the drainage basins of S-2, S-3, S-5A, S-6, S-7, S-8, and S-150, as further defined in the SWIM Plan or permits to be developed pursuant to paragraph 13.

E. "The Everglades Protection Area" ("EPA") means Water Conservation Areas 1, 2A, 2B, 3A, 3B, the Arthur R. Marshall Loxahatchee National Wildlife Refuge, and the Everglades National Park.

F. "Imbalance in natural populations of aquatic flora and fauna" and "imbalance of flora and fauna" shall have the meaning in Florida Administrative Code Rule 17-302.560: "Class III Waters - Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife. (19) Nutrients: In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." Imbalance includes situations when nutrient additions result in nuisance species as defined in Florida Administrative Code Rule 17-302.200(14), or when nutrient additions result in violation of other standards contained in Chapter 17-302 as defined in Rule 17-302.510(3)(j). In the case of the Park and Refuge, imbalance specifically shall include nutrient additions that result in, but are not limited to, replacement of native periphyton algal species by more pollution-tolerant algal species, loss of the native periphyton community or, in advanced stages of nutrient pollution, native sawgrass and wet prairie communities giving way to dense cattail stands or other nutrient-altered ecosystems, which impair or destroy the ability of the ecosystem to serve as habitat and forage for higher trophic levels characteristic of the Everglades. Numerical interpretation of imbalance shall specifically include an array of indices to measure sensitivity of the ecosystem to small changes in

nutrients, such as nutrient cycling processes and the basic components of the Everglades ecosystem, including periphyton and other sensitive indicators of nutrient enrichment. The results of the Research and Monitoring Program will be used to determine numerically the undesirable level of nutrients that cause an imbalance.

G. "Interim concentration limits" for the Park shall mean the concentration limits to be measured at discharges to the Park and attained by ~~July 1, 1997~~ October 1, 2003, as determined in Appendix A.

H. "Interim concentration levels" for the Refuge shall mean the geometric mean of concentration levels to be measured at 14 interior marsh stations and attained by ~~July 1, 1997~~ February 1, 1999, as determined by Appendix B.

I. "Long-term concentration limits" for the Park shall mean the concentration limits to be measured at discharges to the Park and attained by ~~July 1, 2002~~ December 31, 2006, as determined by Appendix A.

J. "Long-term concentration levels" for the Refuge shall mean the geometric mean of concentration levels to be measured at 14 interior marsh stations and attained by ~~July 1, 2002~~ December 31, 2006, as determined by Appendix B.

K. "Outstanding Florida Waters" ("OFWs") shall mean waters designated by the Florida Environmental Regulation

Commission pursuant to Florida Administrative Code Rule 17-302.700.

L. "The Park" shall mean the Everglades National Park, including the Park expansion area, as defined in the Everglades National Park Expansion and Protection Act of 1989, P.L. 101-229.

M. "The Parties" shall mean the United States and the State Parties.

N. "The Refuge" shall mean the Arthur R. Marshall Loxahatchee National Wildlife Refuge.

O. "The State Parties" shall mean the South Florida Water Management District and Timer E. Powers, in his official capacity as Interim Executive Director, or his successors; and the Florida Department of Environmental Regulation and Carol M. Browner, in her official capacity as Secretary, or her successors.

P. "Stormwater Treatment Areas" ("STAs") shall mean the stormwater management systems that are to be designed, acquired, constructed and operated by the District in a manner primarily to provide nutrient removal pursuant to this Agreement. Use of the term "stormwater" in this Agreement shall not limit the source or nature of the water to be treated in the STAs in accordance with this Agreement, and shall include all water discharged to the EPA through the S-5A, S-6, S-7, S-8 and S-150 structures.

Q. "The SWIM Plan" shall mean the Surface Water Improvement and Management ("SWIM") Plan for the Everglades Protection Area as defined in the Marjory Stoneman Douglas Everglades Protection Act of 1991, Chapter 91-80, Laws of Florida.

R. "Technical Oversight Committee" ("TOC") shall mean the committee established in paragraph 18 of this Agreement.

S. "The United States" shall mean the United States of America and its agencies, including but not limited to the United States Department of the Interior, the United States Environmental Protection Agency ("USEPA"), the United States Army Corps of Engineers ("The Corps"), and the United States Department of Agriculture.

T. "The Water Conservation Areas" ("WCAs") shall mean WCAs 1, 2A, 2B, 3A and 3B as described in District map dated September 1985.

SETTLEMENT OF CLAIMS

2. This Agreement settles all claims that the United States raises in the Second Amended Complaint, and all counterclaims to the Second Amended Complaint that the State Parties raise, in United States et al. v. South Florida Water Management District et al., No. 88-1886-CIV Hoeveler (S.D. Fla.).

INTRODUCTION/BACKGROUND OF PROBLEM

3. The Parties agree that the Park and the Refuge are unique and irreplaceable natural resources. As the major remnants of the greatly diminished natural Everglades, the Park and the Refuge

contain unmatched, world-renowned examples of biologically rich and sensitive ecosystems. The nutrient-lean (oligotrophic) condition of the aquatic ecosystems is one hallmark characteristic of the unspoiled Everglades that still exists in the Park, the Refuge and other parts of the Everglades. These ecosystems are changed by even slight increases in nutrient concentrations, particularly increases in the concentration of phosphorus.

A. At the present time, the ecological integrity and ultimately the survival of the Park and Refuge are threatened by the inflow of EAA drainage water containing excess nutrients. Indeed, the high levels of phosphorus in EAA discharges constitute the most immediate water quality concern facing the Everglades system. EAA drainage that flows directly into the Refuge contains average phosphorus concentrations ten to twenty times higher than background concentrations of phosphorus observed at interior marsh sites. Water from the EAA eventually flows into the Park through the WCAs. Thus, maintenance of state water quality standards within the WCAs is crucial to the ecology of the Park.

B. Excess phosphorus accumulates in the peat underlying the water, alters the activity of microorganisms in the water, and disturbs the natural species composition of the algal mat (periphyton) and other plant communities in the marsh. These disturbed communities deplete the marsh of oxygen, and, ultimately, result in native sawgrass and wet prairie

communities being replaced by dense cattail stands or other nutrient-tolerant ecosystems. The ability of the ecosystem to serve as habitat and forage for the native wildlife is thereby greatly diminished or destroyed. These changes constitute imbalances in the natural populations of aquatic flora and fauna or indicators of such imbalances.

C. The Parties agree that surface water entering the Refuge, including water entering through the S-5A and S-6 pumping stations, contains nutrient levels that are causing imbalances in the natural populations of aquatic flora and fauna in violation of state water quality standards.

D. The Parties agree that surface water entering the Park from the WCAs contains excessive nutrients that are being accumulated in the soils and sediments downstream of one or more Park water delivery structures. Once these soils and sediments are loaded with excess phosphorus, nuisance species that thrive on excess phosphorus are able to invade the marsh. The presence of these excessive nutrients is potentially harmful or injurious to animal and plant life in the Park. Accordingly, such nutrient-polluted water is, or is reasonably expected to be, a source of pollution in the Park.

E. The Parties agree that nutrient-polluted water threatens to devastate the ecosystems in the Park and Refuge. The Parties further agree that the actions set forth in this Agreement are necessary to halt or prevent imbalances in

natural populations of aquatic flora and fauna and other water quality violations in the Park and Refuge.

COMMITMENT TO RESTORING AND MAINTAINING WATER QUALITY

4. In recognition of the serious and potentially devastating degradation threatening the Park and the Refuge as a result of nutrient-laden waters, and to further a process that resolves ongoing litigation, the Parties commit themselves to guarantee water quality and water quantity needed to preserve and restore the unique flora and fauna of the Park and the Refuge.

5. The State Parties shall take such action as is necessary so that waters delivered to the Park and the Refuge achieve state water quality standards, including Class III standards, by ~~July 1, 2002~~ **December 31, 2006**. The State Parties commit:

A. To achieve interim phosphorus concentration limits and levels, as reflected in Appendices A and B, by ~~July 1, 1997~~ **October 1, 2003, and February 1, 1999, respectively**.

B. To achieve long-term phosphorus concentration limits and levels, as reflected in Appendices A and B, by ~~July 1, 2002~~ **December 31, 2006**.

6. Compliance with the interim and long-term total phosphorus concentration limits and levels set forth in or established pursuant to this Agreement shall be determined in accordance with the methodologies and procedures set forth below, including the Appendices attached to this Agreement. If a conflict arises between the following summaries and the Appendices, the Appendices shall prevail.

TOTAL PHOSPHORUS CONCENTRATION LIMITS FOR THE PARK

7. The Parties agree that the interim and long-term total phosphorus concentration limits for the Park are as set forth in Appendix A.

A. By ~~July 1, 1997~~ October 1, 2003, interim concentration limits for Shark River Slough must be met. The approximate annual flow-weighted concentration limit will vary based upon total annual flow, with a range of less than 14 ppb for a dry year to less than 9 ppb for a wet year.

B. By ~~July 1, 2002~~ December 31, 2006, the long-term concentration limits must be met for the Shark River Slough, Taylor Slough and Coastal Basins. The long-term concentration limits represent the concentration levels delivered during the OFW baseline period of March 1, 1978 to March 1, 1979, adjusted for observed variations. The approximate long-term concentration limits for Shark River Slough also vary with flow, with a range of less than 13 ppb for a dry year to less than 8 ppb for a wet year. The long-term concentration limit for Taylor Slough (S-332 and S-175) and the Coastal basin (S-18C) is 11 ppb.

C. Compliance with these concentration limits is expected to provide a long-term average flow-weighted mean inflow concentration of approximately 8 ppb for the Shark River Slough Basin and 6 ppb for the Taylor Slough and Coastal Basins. Monitoring of biological responses in the Park will determine if these limits are sufficient to prevent an

imbalance of flora and fauna; if not, these limits will be adjusted to prevent an imbalance of flora and fauna.

TOTAL PHOSPHORUS CONCENTRATION LEVELS AND DISCHARGE LIMITS FOR THE REFUGE

8. The Parties agree that the interim and long-term total phosphorus concentration levels for the Refuge are as set forth in Appendix B. Total phosphorus concentration levels for the Refuge were calculated from water quality data collected by the District from 1978 to 1983.

A. ~~**By July 1, 1997,**~~ ~~**p**~~**P**hosphorus loads discharged from the EAA will be reduced by approximately 80% to the EPA **by October 1, 2003,** and **will be reduced by approximately** 85% to the Refuge **by February 1, 1999,** as compared to mean levels measured from 1979 to 1988.

B. Interim concentration levels for the Refuge, which are effective ~~**July 1, 1997**~~ **February 1, 1999**, are based on the relationship between phosphorus concentrations measured at the 14 interior marsh stations and water elevations measured at 3 gauges within the Refuge. Compliance with these concentration levels is intended to limit mean phosphorus concentrations in water samples collected monthly at 14 interior marsh stations to values between 8 and 22 ppb when water elevations in the Refuge are between 17.14 and 15.42 feet msl, respectively.

C. Inflows to the Refuge must result in compliance with Class III water quality criteria or long-term concentration levels, whichever are lower, by ~~**July 1, 2002**~~ **December 31,**

2006, as set forth in Appendix B. Research and monitoring will be conducted under this Agreement to interpret what phosphorous concentration levels comply with Class III water quality criteria.

D. The STA and best management practices ("BMPs") programs are designed to limit Refuge inflow discharge concentrations to a long-term average of 50 ppb. DER will require compliance with a maximum annual discharge limit of 50 ppb for Refuge inflows if the interim or the lower of the long-term marsh concentration levels or Class III nutrient criteria are not being met by the effective dates. By ~~July 1, 2002~~ December 31, 2006, if the 50 ppb maximum annual inflow discharge limit is being met but the lower of the long-term marsh concentration levels or Class III nutrient criteria is being violated, DER will enforce more stringent inflow discharge limits.

WATER QUANTITY REQUIREMENTS

9. Quantity, distribution and timing of water flow to the Park and Refuge must be sufficient for maintaining and restoring the full abundance and diversity of the native floral and faunal communities throughout the Park and Refuge. The Parties shall take all actions within their authority necessary to provide adequate flows to meet the water quantity, distribution, and timing needs of the Park and the Refuge. The District shall implement mitigation measures to offset flow reductions to the EPA resulting from efforts to improve the water quality in the EPA. Additionally, the Parties through

the TOC shall jointly develop specific elements of these actions as part of a basin-wide Everglades ecosystem restoration plan. Nothing in this Agreement shall limit or prejudice any rights of the Park or Refuge under State or Federal law to obtain greater or more specific water quantity.

IMPLEMENTATION OF STORMWATER TREATMENT AREAS

10. The District **and the Corps** commit~~s~~ to purchase, design and construct STAs as set forth in Appendix C.

A. The primary strategy to remove nutrients from agricultural runoff is the construction and operation of STAs, which are large scale wetland treatment systems constructed by the District **and the Corps**. These STAs will mainly receive stormwater directly from the primary agricultural drainage canals and process it for the removal of nutrients through intensive management. Deliveries may be made to the STAs from Lake Okeechobee or other sources. These areas will be designed, operated and managed primarily to purify the water before it enters the WCAs, the Park and the Refuge. In addition, their size and location may allow significant improvement in the manner in which water is introduced into the natural areas. By allowing the reintroduction of sheet flow into tens of thousands of acres of Everglades, the completion of these projects has the potential for improving Everglades hydroperiod.

B. The District agrees to acquire the lands set forth in Table 1. Table 1 provides an estimate of the effective

treatment acres of STAs. The design sizes and configurations of STAs are based on the need to achieve an interim outflow concentration of approximately 50 ppb at each STA outflow point. The Class III phosphorus criteria when interpreted by research will be implemented by ~~July 1, 2002~~ December 31, 2006, if lower than the long-term concentration levels. The size of each STA is based on the assumption that the volume of flows experienced during the 1979 to 1988 base period from each tributary basin would be treated with no hydraulic bypass. These STA acreages (with future adjustments as may be required based upon performance as set forth in Appendix C) and the BMP regulatory program provide the control programs which are anticipated to meet both the interim and long-term Park and Refuge phosphorus concentration limits and levels. However, notwithstanding the implementation of these control programs, if the concentration limits and levels are violated, then the State Parties will implement additional remedies, such as any necessary expansion of STAs, more intensive management of STAs, a more stringent EAA regulatory program, or a combination of the above. The State Parties shall not implement more intensive management of the STAs as the sole additional remedy.

C. Table 1. STA Effective Acreage

Basins Treated	STA	~~Approx. Total Acres to be Acquired~~		Approx. Effective Treatment Acres
S5A, C51W	STA-1W	~~12,500~~	~~11,800~~	6,670
C51W, S5A	STA-1E			5,350
S6, S5A, 298	STA-2	~~4,000~~	~~3,700~~	6,430
S7, S8, 298, C139, L.O.	STA-3/4	~~5,270~~	~~4,950~~	16,660
C139	STA-5			4,530
S-8	STA-~~4~~6	~~12,930~~	~~12,150~~	812
TOTAL:		~~34,700~~	~~32,600~~	40,452

D. ~~The 11,800 acres of STA-1 includes 7,400 effective treatment area acres which will be constructed and in operation by July 1, 1997, and 4,400 effective treatment area acres which will be constructed and in operation by July 1, 2002, if the long-term phosphorus concentration levels for the Refuge are not met by July 1, 2000.~~ Each of the four major drainage basins in the EAA will have a treatment system. They will be designed to treat all the flow from the EAA with respect to the 1979-1988 base period. If long-term concentration limits and levels are not met by ~~July 1, 2002~~ December 31, 2006, additional acreage will be required as described in Appendix C.

RESEARCH AND MONITORING

11. The Parties agree to the research and monitoring program set forth in Appendix D.

A. Several aspects necessary to achieve compliance with this Agreement must be defined by additional research. The research objectives are to:

1. Numerically interpret the narrative Class III nutrient water quality criteria (i.e., the nutrient levels which cause an imbalance of flora and fauna in the units of the EPA); and

2. Assess current and continuing responses of the EPA to nutrient input levels resulting from the efforts to achieve interim and long-term concentration limits and levels.

B. A key component of these research efforts is the development (including appropriate data collection) of models of phosphorus dynamics in the EPA. For example, one priority would be an understanding of the relationships between phosphorus input and water quality at the 14 interior marsh stations in the Refuge, including definition of the future role of recycling of previous excess phosphorus inputs.

C. Studies designed to test the response of key ecosystem components and processes to different phosphorus input rates are another important focus of the research program. An array of indices will be used to measure sensitivity of the ecosystem to small changes in nutrients. These will include nutrient cycling processes and the basic components of the Everglades ecosystem, such as periphyton, and other sensitive indicators of nutrient enrichment. These indices will be used to determine the criteria for compliance in the

EPA with the Class III nutrient criteria under the terms of this Agreement.

D. Research on the performance of STAs and BMPs is also required to ensure achievement of the intent of this Agreement.

E. An intensive program of monitoring is required to track compliance with interim and long-term concentration limits and levels, as well as the response of Everglades flora and fauna to the phosphorus levels achieved. The monitoring program will also provide data for modeling research.

F. The State Parties shall be primarily responsible for the research and monitoring set forth in this Agreement~~, in the Marjory Stoneman Douglas Everglades Protection Act and in the Surface Water Improvement and Management Act,~~ and under state law with support from the United States. The National Park Service, the US Fish and Wildlife Service, the USEPA and the Corps will assist in the research and monitoring as appropriate. For example, funds available under section 319 of the Clean Water Act can be granted to the State Parties by USEPA in support of approved monitoring programs to assess the effectiveness of BMPs and STAs. All aspects of the research and monitoring programs will be directed by the TOC.

REGULATORY PROGRAM

12. The State Parties agree to initiate a regulatory program as set forth in Appendix E.

A. The goal of the regulatory strategy is to reduce present total phosphorus loads from the EAA to each STA by at least 25%, by February 1996. An interim target reduction of 10% in total phosphorus load from the EAA will be required by February 1994. The District will adopt rules to implement the regulatory program by April 1992. The rules are scheduled to be effective in May 1992. At a minimum, by July 1993 the DER or the District shall require and issue permits under an appropriate permitting vehicle, regulating water quality for all dischargers in the EAA, in a manner consistent with the terms of this Agreement; or, if permits are not issued by that date, institute appropriate compliance and enforcement action, as provided in paragraph 14.

B. The regulatory program will require permits for the discharge of water from the internal drainage systems in the EAA. Applicants that demonstrate sufficient ability and authority may be eligible for a Master Permit for a defined geographic area. Applicants will be required to meet specified long-term phosphorus load allocations as described in Appendix E. Applicants will be required to institute a BMP Program designed to meet the applicable interim and long-term phosphorus basin load allocation. Compliance with these basin load allocations should result in the interim and long-term (1996) target reduction of 10% and 25% respectively in total phosphorus load from the EAA, being

achieved. Applicants will also be required to submit acceptable water quality monitoring plans designed to document compliance with annual load allocation, BMP implementation and operation, BMP effectiveness, and identification of high episodic phosphorus events.

C. EAA permittees will be required to submit quarterly and annual reports of water quality monitoring results to the District. Permittees will also be required to submit annual reports to the District summarizing BMP implementation and effectiveness.

D. Regulatory program enforcement will strive to identify critical problems before unacceptable loads occur. Compliance with total phosphorus load allocations will be determined by measuring flow and concentration at the applicant's property boundary, with appropriate adjustment for hydrologic variability with respect to the 10 year base period, such as an adjustment for rainfall considering that year's rainfall versus average annual rainfall over the 10-year base period.

E. Permittees exceeding the permitted areal phosphorus load allocation for February 1994 or 1996 shall be required to submit to the District a plan for monitoring on a continuous basis and a proposed compliance plan and schedule designed to achieve compliance within 6 months.

F. The District will review the permittee's plan and schedule. If they are acceptable, the District will amend

the permit accordingly. If they are unacceptable, the District will take appropriate enforcement action as set forth in paragraph 14 or Appendix E.

IMPLEMENTATION AND ENFORCEMENT PROCEDURES

13. The State Parties shall use the full scope and authority of their planning, regulatory, permitting, enforcement and public works powers, to bring the waters in the Park and Refuge into compliance with the interim and long-term concentration limits and levels in this Agreement by ~~July 1, 1997~~ **the following dates: by February 1, 1999, for interim compliance for the Refuge; by October 1, 2003, for interim compliance for the Park; and by December 31, 2006, for long-term compliance for the Park and Refuge** ~~and July 1, 2002 respectively~~. Without constituting a limitation on their ability to exercise this authority, the State Parties shall exercise such authority as follows:

A. The State Parties shall develop an overall plan to restore and protect the Park and the Refuge pursuant to the following schedule:

(1) The District shall develop a SWIM Plan, consistent with Appendices A through E, and approve it for presentation to DER pursuant to Section 373.456(1), F.S., by the October 1991 Governing Board meeting.

(2) DER shall submit to the District within 30 days after receipt of the approved SWIM Plan its determination of consistency with state water policy and

the state comprehensive plan in accordance with Section 373.456(2), F.S.

(3) The District shall take final agency action in adopting the SWIM Plan by March 31, 1992.

(4) The District shall apply to DER for 5-year interim permits by October 1, 1991, pursuant to the provisions of Section 373.4592(6), F.S. The application shall be designed to achieve the interim concentration limits and levels as set forth in Appendices A and B. At a minimum, the application shall include the interim concentration limits and levels, the nutrient removal (STA) program, proposed regulatory program and research and monitoring program, consistent with Appendices A through E. ~~Prior to expiration~~ **By December 31, 2003**, the District shall ~~apply for renewal of the permits~~ **submit to DEP a permit modification**, as provided in the Section 373.4592~~(6)~~**(10)**, F.S. to achieve **by December 31, 2006** the long-term concentration limits and levels set forth in Appendices A and B.

(5) The DER shall take final agency action on the permit applications on or before July 1, 1992; or, alternatively, initiate appropriate compliance and enforcement actions as set forth in paragraph 14 if permits are not issued by then.

(6) ~~The District shall initiate~~ Land acquisition and construction for the STAs shall be completed as set forth in the following table:

STA ~~Acquisition~~ Completion Schedule

~~Basin~~	~~STA~~	~~Approx. Total Acres to be Acquired~~	~~Date Acquisition to be Initiated~~
~~S-5A~~	~~STA-1~~	~~12,500~~	~~October 1, 1991~~
~~S-6~~	~~STA-2~~	~~4,000~~	~~August 1, 1992~~
~~S-7~~	~~STA-3~~	~~5,270~~	~~August 1, 1992~~
~~S-8~~	~~STA-4~~	~~12,930~~	~~August 1, 1992~~

STA	APPROXIMATE EFFECTIVE ACREAGE	LAND ACQUISITION	STA CONSTRUCTION
1W	6,670	April 1, 1996	January 1, 1999
1E	5,350	July 1, 1998	July 1, 2002
2	6,430	April 1, 1996	February 1, 1999
3/4	16,660	July 1, 2000	October 1, 2003
5	4,530	July 1, 1996	January 1, 1999
6	812	July 1, 1996	October 1, 1997

(7) The State Parties shall seek expedited resolution of any judicial or administrative proceedings with regard to implementation of their commitments in this Agreement in order to meet the schedules set forth in this Agreement.

B. The proper concentration limits and levels for total phosphorous in surface waters entering and within the Park and Refuge and nutrient removal acreage required to improve and protect water quality are based on the scientific and technical evidence developed by the Parties and set forth and referred to in the Appendices. In any administrative hearing on the SWIM Plan or permits, the State Parties shall

support and defend the SWIM Plan and permits consistent with Appendices A through E. The United States shall provide technical assistance to support the State Parties in accordance with paragraphs 17 and 18.

14. The State Parties acknowledge that they have the authority to initiate compliance and enforcement action as set forth below. This Agreement does not constitute a limitation on the ability of the State Parties to exercise such authority.

A. The DER acknowledges that it has the authority to require persons reasonably expected to be **unlawful** sources of pollution affecting the Park or Refuge to undertake action necessary to achieve and maintain compliance with water quality standards in the Park and Refuge. Such authority includes the following:

(1) Initiation of administrative or civil enforcement action against persons responsible for **unlawful** sources of pollution affecting the Park and Refuge to correct or eliminate the sources of pollution, and to seek civil penalties and recovery of damages for violations.

(2) Issuance, modification or revocation of permits for such persons.

B. The District acknowledges that it has the statutory authority to require persons constructing, altering, operating or maintaining surface water management or stormwater management systems, using or withdrawing water, or connecting to or making use of works of the District, to

undertake action ~~necessary~~ **legally required** to achieve and maintain compliance with water quality standards in the Park and Refuge. Such authority includes the following:

(1) Initiation of administrative or civil enforcement action against persons responsible for the activities described above to correct or eliminate **unlawful** sources of pollution and to seek civil penalties and recovery of damages for violations.

(2) Issuance, modification or revocation of permits for such persons.

C. In the event that the schedule set forth in this Agreement for achieving and maintaining timely compliance with water quality standards is not met, the State Parties commit to exercise their authority as set forth in this paragraph to initiate appropriate action to achieve and maintain compliance with water quality standards.

15**A**. The Corps shall apply to DER for stormwater management permit(s) pursuant to Section 373.416, F.S., for the operation of S-10, S-11, and S-12 water control structures, and for the construction and operation of new structures which may affect the Park or Refuge, and shall comply with reasonable permit terms and conditions relating to the abatement of the water quality problems addressed in this Agreement. For existing structures S-10, S-11, S-12, the Corps shall apply on or before October 1, 1991. The DER anticipates that stormwater management permits for these existing structures may include monitoring, adjustments to regulatory

schedules and participation in research consistent with this Agreement. The DER shall not require the Corps to construct any STAs as a part of the operating permit(s) to be issued for the S-10, S-11, and S-12 water control structures. The Corps agrees to cooperate in the modification of its regulation of the Central and Southern Florida Project in order to support the objectives set forth in this Agreement. New structures to be designed and constructed by the Corps shall be designed and constructed in a manner consistent with this Agreement. Nothing in this Agreement shall alter or affect the obligations of the parties to the Memorandum of Understanding between the Corps and DER dated December 4, 1979, as amended. Future projects designed by the United States which affect the Park or Refuge shall consider the environmental and water quality commitments set forth in this Agreement.

15B. By July 1, 2002, the Corps shall complete construction of STA 1E in conjunction with the currently authorized C-51 flood control project. The District shall be the local sponsor for the flood control project, and the United States shall use its best efforts to secure federal funding for its share of the cost of constructing STA 1E.

PRESERVATION AND PROTECTION OF THE RIGHTS OF THE MICCOSUKEE AND SEMINOLE TRIBES

16. Nothing in this Agreement shall diminish or alter the governmental authority and powers of the Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida, or diminish or alter the rights of those tribes, including rights under any

tribal agreement with any Party to this Agreement. No land of either the Miccosukee Tribe of Indians of Florida or the Seminole Tribe of Florida shall be used for STAs to be established under Appendix C of this Agreement without the consent of the Tribe involved.

MUTUAL COOPERATION

17. The Parties agree that mutual cooperation is essential to implementing the actions necessary to achieve the commitments set forth in this Agreement. To accomplish this the Parties will provide assistance to each other in their responsibilities under this Agreement, including but not limited to the sharing of information, defense of this Agreement against challenges by others, support for the acquisition of funds to assist in the accomplishment of these commitments, and the provision of technical and scientific assistance to any party seeking to defend in legal proceedings any of the commitments in this Agreement.

TECHNICAL OVERSIGHT COMMITTEE (TOC)

18. Each of the persons designated in paragraph 19A shall appoint one technical representative, and one alternate to the TOC. The TOC will plan, review and recommend all research, monitoring and compliance, conducted pursuant to the terms of this agreement, and will consider technical advice and assistance for each activity as necessary from the appropriate agencies and from other state and federal agencies and consultants. The TOC will make technically based recommendations by consensus approach; when a technically based recommendation cannot be reached by consensus, a 4 out of 5

majority, the impasse will be reported back to the Parties for mediation as provided for in paragraph 19.

SETTLEMENT OF DISPUTES

19. The Parties desire and agree to use their best efforts to work cooperatively toward achieving the restoration and maintenance of water quality in the Everglades. The Parties shall endeavor at all times to maintain a spirit of cooperation and to settle disagreements through good faith negotiations between or among themselves.

A. The following persons or their designees are responsible for notifying their respective counterparts of the initiation of the procedures set forth in this paragraph:

(1) Superintendent of the Park;

(2) Manager of the Refuge;

(3) Secretary of DER;

(4) Executive Director of the District; and

(5) District Engineer, Jacksonville District, U.S. Army Corps of Engineers.

B. The Party seeking to utilize these provisions must notify all other Parties, counsel of record for the United States, and the general counsels for the State Parties, of the initiation of these procedures.

C. The Party seeking relief shall first notify the other Parties to this Agreement in writing by certified mail, return receipt. Representatives of the Parties shall

arrange to meet within 15 days of receipt of such notice for the purpose of consulting and resolving the concern.

D. If after meeting the Parties cannot resolve the concerns within a reasonable time, any Party may require mediation. The Parties shall attempt to agree upon a single mediator. Alternatively, the State Parties shall designate one mediator and the United States shall designate the other. Any efforts for mediation shall conclude within 60 days of the receipt of the certified letter unless the Parties otherwise agree in writing.

E. If consultation or mediation has failed to resolve the concerns, any Party shall be entitled to apply to the Court for judicial resolution of the disagreement. Such application shall be by motion setting forth the matter in disagreement and the relief being requested to address the disagreement. No Party shall be entitled to file such a motion, or otherwise to seek judicial resolution of the disagreement, unless and until the procedures set forth above have been tried and exhausted.

F. Resort to the procedures contained in this paragraph shall not extend or postpone any Party's obligations under this Agreement.

LITIGATION COSTS

20. Each party shall bear its own costs and fees, and each party waives any right to seek penalties and damages, for all proceedings in this case up to and including entry of an order approving and

incorporating this Agreement as provided in paragraph 22. Nothing in this paragraph shall constitute a limitation on any party to seek appropriate relief in conjunction with any action to enforce any of the terms of this Agreement.

INTEGRATION CLAUSE

21. This Agreement incorporates the entire agreement between the District, DER and the United States with respect to the claims brought by the United States and the counterclaims brought by the State Parties. No part of this Agreement shall be binding on the Parties unless it is approved in its entirety by Court order, unless the Parties agree otherwise in writing.

JURISDICTION

22. The Parties acknowledge that the Court has jurisdiction over this action, but all Parties reserve their rights to raise jurisdictional issues in any other actions. The Parties agree to the entry of the proposed order attached hereto as Exhibit 1 by which the Court shall retain jurisdiction over this action for the purpose of enabling any of the Parties to this Agreement to apply to the Court at any time for such further orders or directives as may be necessary or appropriate for enforcement or modification of this Agreement.

FORCE MAJEURE

23. The Parties recognize that notwithstanding their compliance with the commitments contained herein, events beyond their control may prevent or delay one or more commitments. Such events may include natural disasters as well as unavoidable legal barriers

or restraints, including those arising from the actions of persons not Parties to this Agreement. **Except as provided by law,** ~~F~~force majeure shall not include increased costs of activities covered by this Agreement, whether or not anticipated at the time such activities were initiated. Force majeure shall not continue beyond the circumstances and conditions that prevent timely performance, and shall not apply if alternative means of compliance are available. If a Party is of the opinion that such an event has occurred, that Party has an affirmative obligation to initiate immediately the dispute resolution provision set forth in paragraph 19, as a prerequisite to seeking relief from that Party's commitments. The Party claiming force majeure shall have the burden of proof.

APPENDIX A

PHOSPHORUS LIMITS FOR INFLOWS INTO EVERGLADES NATIONAL PARK

Attachment I describes interim and long term total phosphorus limits for the combined inflow to Shark River Slough. These limits shall apply to the annual Water Year (October 1 - September 30) flow-weighted-mean concentration of inflows to Shark River Slough, composited across all structures, including S-12A, S-12B, S-12C, S-12D, S-333, and any subsequent inflow points from the WCAs established in the future. Attachment II describes long term discharge limits which will apply to the combined inflow to the Taylor Slough (S-332 and S-175) and Coastal (S-18C) basins. In each basin, long term discharge limits are the limits necessary to meet the OFW water quality criteria as measured at the structures discharging into the Park. These limits will also apply to areas immediately downstream in the Park and will be used to determine compliance. The adequacy of these OFW criteria to meet the State water quality standard Class III criteria (to prevent an imbalance of flora and fauna) will be verified by long term monitoring and research.

If research to determine the numeric value for the Class III narrative nutrient criteria results in a more stringent Park phosphorus limit, then the more stringent inflow limit shall apply.

Effective dates for the phosphorus inflow limits are as follows:

Water Body	Effective Dates
Shark River Slough-Interim Limits	~~July 1, 1997~~ October 1 2003
Shark River Slough-Long-Term Limits	~~July 1, 2002~~ December 31 2006
Taylor Slough and Coastal Basins -Long-Term Limits	~~July 1, 2002~~ December 31 2006

Phosphorus limits apply to flow-weighted-mean concentrations computed on an annual Water Year basis, with data reported and calculated on a monthly basis. To account for hydrologic variations in Shark River Slough, the limits vary with the previous 12-month's total flow in each basin. The long term limit for Taylor Slough and the Coastal Basin is fixed and does not vary with flow. The limits represent the 10% rejection level of the observed flow-weighted-mean concentration at a given total annual flow, adjusted to a baseline time period of March 1, 1978 to March 1, 1979 for Shark River Slough (OFW baseline). The baseline time period for the Taylor Slough and Coastal Basins is Water Year 1984. Compliance with these limits is expected to provide a long term average flow-weighted mean inflow concentration of approximately 8 ppb for the Shark River Slough Basin and 6 ppb for the Taylor Slough and Coastal Basins. Approximate values are as follows:

	Dry Year (117 Kac-ft/yr)	Wet Year (1061 Kac-ft/yr)
Shark River Slough - Interim Limits		
Flow-Weighted Mean	< 14 ppb	< 9 ppb
Shark River Slough - Long Term Limits		
Flow-Weighted Mean	< 13 ppb	< 8 ppb

Taylor Slough & Coastal Basins - Long Term Limit is 11 ppb.

Frequency of samples exceeding 10 ppb within a given 12-month period have also been developed to aid in tracking compliance. Approximate values are as follows:

	Dry Year	Wet Year
Shark River Slough - Frequency Exceedance Frequency > 10 ppb	< 70 %	< 40 %

Taylor Slough & Coastal Basins - Frequency Exceedance must be <53%.

Precise values for the Shark River Slough flow-weighted-mean concentration limits and the frequency at which 10 ppb can be exceeded can be calculated for a given annual flow using the equations given in Attachment I.

A panel of scientists designated by the TOC will track and evaluate compliance with all aspects of state water quality standards including the phosphorus limits, concentration levels and criteria. The represented agencies may request technical assistance from others.

After each additional sampling round at intervals of every other week, the flow-weighted mean will be calculated based upon data from the previous 12 months and compared with the limits corresponding to the previous 12-month's total flow. If the flow-weighted-mean limit is exceeded, the panel will be convened to review recent monitoring data and assess potential causes. Any agency represented on the TOC may request an official review of the monthly mean and frequency calculations for potential violations of the phosphorus limits during the water year.

An exceedance occurs if the flow-weighted-mean concentration for the water year ending September 30th is greater than the 10% rejection level of the computed limit (see Attachments). Based

upon review of trends for flow-weighted means, trends for the frequencies of samples exceeding 10 ppb, and other information found relevant by the panel, the TOC members will forward their opinions and recommendations to their respective agencies for appropriate action. An exceedance will constitute a violation unless the TOC determines there is substantial evidence that it is due to error or extraordinary natural phenomena. A violation of a long term limit shall constitute a violation of this Agreement and of the OFW water quality standard for Park areas immediately downstream of the inflow structures.

Attachment I - Discharge Limits and OFW Standards for Shark River Slough

Interim Discharge Limit:

$$C = 11.16 - .00465Q + 1.397[\ 6.377 - .00591Q + .00000436Q^2]$$

Long-Term Discharge Limit & OFW Standard:

$$C = 11.38 - .00538Q + 1.397[\ 2.493 - .00231Q + .00000170Q^2]$$

Frequency Exceedance:

$$F = 48.411 - 0.02896Q + 1.397[\ 330.1 - 0.3071Q + 0.0002254Q^2]$$

Terms:

Water Year = October through September

Q = total inflow to Shark River Slough for water year, S-12s + S-333 + any additional inflow from the WCAs established in the future, thousand acre-ft/yr (Kac-ft/yr).

C = limit on maximum flow-weighted-mean inflow concentration for any Water Year, composite of all inflows to Shark Slough (ppb).

F = exceedance for maximum frequency (percent) of inflow concentrations exceeding 10 ppb, computed from the time series of concentrations composited across all inflow structures on each sampling date with positive flow in a given Water Year.

The range of flow (Q) used in deriving the limits is 117 to 1061 Kac-ft/yr. If the total flow for any water year exceeds 1061 Kac-ft/yr, a flow of 1061 Kac-ft/yr should be used in calculating the discharge limits.

Attachment II - Discharge Limits and OFW Standards for Taylor Slough and Coastal Basins

Long-Term Flow-weighted Discharge Limit & OFW Standard = 11.0 ppb

Frequency Exceedance:

Frequency of values > 10 ppb must be less than 53.1%.

Terms:

Limits are defined on a Water Year basis, October through September.

Basin flow is the total flow through structures S-332, S-175, S-18C, plus any new release points from this basin established in the future, thousand acre-ft/yr (Kac-ft/yr).

Limits apply to the flow-weighted-mean concentration for any Water Year, composite of all inflows to Taylor Slough (S-332) and Coastal Basin (S-18C).

Frequency exceedance is the exceedance for maximum frequency (percent) of inflow concentrations exceeding 10 ppb, computed from the time series of concentrations composited across all inflow structures on each sampling date with positive flow in a given Water Year.

APPENDIX B

PHOSPHORUS LEVELS AND DISCHARGE LIMITS FOR LOXAHATCHEE NATIONAL WILDLIFE REFUGE

Attachments I and II describe interim and long term total phosphorus concentration levels for the 14 Loxahatchee National Wildlife Refuge interior marsh stations. These concentration levels shall apply to monthly samples collected at 14 interior stations (CA1-3 to CA1-16) (map attached) when the average stage at the CA1-7, CA1-9, and CA1-8C gauges is greater than 15.4 feet msl (mean sea level). Phosphorus concentration levels apply to individual sampling date means. Sample date means represent geometric means, calculated from measurements at all of the 14 stations with sufficient water for accurate sampling. To account for the observed correlation between marsh total phosphorus concentration and stage, the concentration levels vary with the average interior stage on the date of sample collection. Effective dates for the phosphorus concentration levels are as follows:

	Effective Date
Interim Marsh Concentration Level (14 station geometric mean)	~~July 1, 1997~~ February 1, 1999
Marsh - Class III Standard (Applies to entire marsh)	~~July 1, 2002~~ December 31, 2006

or

Long-Term Concentration Level
(14 station geometric mean)

Interim Concentration Levels

The interim levels represent the 10% rejection level of the observed 14 station interior marsh mean concentration at a given

mean daily stage, adjusted to a baseline time period of June 1978 - to June 1979. Compliance with these concentration levels is expected to provide a long term mean 14 station interior marsh concentration of approximately 10 ppb. Interim values for the 14 station mean concentration levels can be calculated for a given mean daily stage using the equations given in Attachment I. Approximate values are as follows:

	Low Stage (15.42 ft msl)	**High Stage** (17.14 ft msl)
Interior Marsh Interim Concentration Levels (14 station geometric mean)	22 ppb	8 ppb

The current control program, consisting of on-line STAs and BMPs, as described in Appendices C and E, is designed to achieve a long-term average annual flow-weighted concentration of 50 ppb for each discharge to the Refuge and WCAs from the EAA. If the interim, or the lower of the long-term Refuge interior marsh station concentration levels or Class III criteria, are not met with the current control program, DER will require additional components to be added to the control program to meet a maximum annual discharge limitation of 50 ppb for all discharges into the Refuge from the EAA. The range of additional components will include increased STA acreage, more intensive management of STAs, a stronger regulatory program, or a combination of the above, based on actual performance achieved with the initial STA design and operation and the actual performance of BMPs as discussed in Appendices C and E. The State Parties shall not implement more intensive management of the STAs as the sole additional component. DER will modify the permit for

the operation of the Refuge inflow structures to include the additional components of the control program and to establish 50 ppb as a maximum annual discharge limitation which would be enforceable after the additional components are operational.

Class III Criteria

The numerical interpretation of the Class III criteria for total phosphorus for the Refuge shall be determined by a research program designed by a panel of scientists designated by the Technical Oversight Committee. The research program must be recommended by the TOC. Such research shall begin no later than July 1, 1992 and a final report shall be completed no later than ~~July 1, 1997~~ **December 1, 2001**. The purpose of the research will be to determine water column total phosphorus concentrations above which imbalances in populations of the natural flora and fauna within the Refuge will occur and to determine the numerical interpretation of the Class III nutrient criterion for total phosphorus. Effective ~~July 1, 2002~~ **December 31, 2006**, the long-term total phosphorus concentration levels for the Refuge will be the 10% rejection level of stations CA1-5, CA1-6 and CA1-16 at a given mean daily stage. These three stations had the lowest geometric mean total phosphorus concentrations during the 1978-1983 baseline period. The long term concentration levels will apply to all 14 stations. Compliance with these concentration levels is expected to provide a long term average 14 station interior marsh concentration of approximately 7 ppb. Precise values for the levels can be calculated for a given

mean daily stage using the equations given in Attachment II. Approximate values are as follows:

	Low Stage (15.42 ft msl)	**High Stage** (17.14 ft msl)
Interior Marsh - Long Term Concentration Levels (14 station geometric mean)	17	7

If the TOC determines Class III total phosphorus concentration levels are lower than the long term total phosphorus concentration levels then the lower levels shall apply.

~~**With respect to STA-1, the original design, in operation by 1997, will include an effective treatment area of 7400 acres. The remaining acreage (4400 effective treatment area acres plus approximately 290 acres for berms, etc.) will be placed in service if the Refuge's long term concentration levels have not been met by the July 1, 2000.**~~ If the lower of the Class III or long-term levels is not met by ~~**the July 1, 2002**~~ **December 31, 2006** and the 50 ppb maximum annual discharge limit is being met at all inflow structures into the Refuge from the EAA, the TOC will recommend a lower maximum annual discharge limit for the structures to be enforced by DER. Additional actions, such as regulatory measures and increased STA acreage, as appropriate from the empirical data on performance of each program, will be required by either DER or the District to meet the lower discharge limit.

Compliance Review

A panel of scientists designated by the TOC will track and evaluate compliance with all aspects of state water quality standards including the phosphorus limits, concentration levels and criteria.

The represented agencies may request technical assistance from others. An exceedance occurs if the 14 station mean concentration is greater than the computed concentration level two or more times in any 12 consecutive sample collections. Based upon review of monthly trends for the 14 station mean and other relevant information, the TOC members will forward their opinions and recommendations to their respective agencies for relevant action. An exceedance will constitute a violation of this Agreement and relevant water quality criteria unless the TOC determines there is substantial evidence that it is due to error or extraordinary natural phenomena. If fewer than three sampling date geometric means collected within the past 12 consecutive sampling periods are below the mean interior marsh total phosphorus concentration level during the baseline period, then the panel will be convened to review monitoring data and assess the potential causes and recommend changes in the total phosphorus levels as necessary to meet the objectives of this Agreement.

Attachment I - Interim Marsh Concentration Levels for Loxahatchee National Wildlife Refuge

Interim Marsh Concentration Levels:

$$C = 11.9187 - .603261S + 1.372[\ 7.5311 - .9247S + .02882758S^2]$$

Terms:

C =The natural log of the geometric mean total phosphorus concentration across 14 marsh stations (CA1-3 to CA1-16).

S =Average stage measured at gauges CA1-9, CA1-7, and CA1-8C on sampling date (feet)

This equation is applicable over a stage range of 15.42 to 17.14 feet. If the stage on any sampling date exceeds 17.14 feet, a stage of 17.14 feet should be used in calculating the concentration levels. The concentration levels should not apply to dates when the average stage is less than 15.42 feet.

Attachment II - Long Term Marsh Concentration Levels for Loxahatchee National Wildlife Refuge

Long Term Marsh Concentration Levels:

$$C = 10.7172 - .541156S + 1.372[\ 7.5819 - .9310S + .02902216S^2]$$

Terms:

C =The natural log of the geometric mean total phosphorus concentration across 14 marsh stations.

S =average stage measured at gauges CA1-9, CA1-7, and CA1-8C on sampling date (feet)

This equation is applicable over a stage range of 15.42 to 17.14 feet. If the stage on any sampling date exceeds 17.14 feet, a stage of 17.14 feet should be used in calculating the long term concentration levels. The equation shall not apply to dates when the average stage is less than 15.42 feet.

APPENDIX C

STORMWATER TREATMENT AREAS (STAs)

The control program described below and in Appendix E is anticipated to meet interim and long term concentration levels and limits for Everglades National Park (Park) and Loxahatchee National Wildlife Refuge (Refuge). The control program is designed to achieve approximately an 80% reduction in phosphorus loads from the Everglades Agricultural Area (EAA) to the Everglades Protection Area (EPA) by ~~July 1, 1997~~ October 1, 2003 and greater than an 85% reduction in phosphorus loads to the Refuge by ~~July 1, 2002~~ December 31, 2006, relative to average annual loads measured in Water Years 1979 through 1988. This objective can be achieved through the combined use of agricultural best management practices (BMPs) and stormwater treatment areas (STA's) designed and operated to maximize phosphorus removal.

Key Assumptions for sizing STAs:

The sizes and locations of the STAs have been determined based upon the following assumptions:

1) It is assumed that the BMP Regulatory Program will achieve a 25% load reduction from each EAA watershed. The 25% load reduction will be assured through performance limitations associated with the BMP Regulatory Program. This represents a realistic estimate of the efficiency of a BMP program in removing phosphorus based upon BMP research conducted by the Institute of Food and Agricultural Science.

2) It is assumed that water retention (i.e. water lost to surface water flow downstream from the EAA) due to implementation of BMPs will equal 20% of the total base flow that was discharged from the EAA from 1979 through 1988.

3) Based upon worldwide experience with whole-system wetland treatment areas, the STAs should be capable of removing approximately 70% of their influent phosphorus loads. A further load reduction of approximately 6% is expected to result from conversion of existing agricultural lands into STAs. The combined load reductions attributed to land-use changes (6%), BMP's (25%) and STAs (70%) applied in series can therefore be reasonably expected to achieve a total reduction of approximately 80% relative to the amount of phosphorus that was historically discharged from the EAA into the EPA.

4) It is assumed that an effective settling rate for total phosphorus of ~~8~~ <u>10.2</u> meters/yr will characterize phosphorus uptake within the STAs. This settling rate is based upon historical uptake rates estimated for the WCA-2A system (which is not managed to maximize nutrient uptake) and is supported by long-term performance data from wetland treatment systems worldwide.

5) The initial size calculations are based on the assumption that the volume of flows experienced during the 1979 to 1988 base period from each tributary basin would be treated with no hydraulic bypass during storm events (i.e. all water gets treated).

6) For modeling purposes, the historic nutrient load and flow from each basin was reduced to account for (a) low-flow water-supply deliveries (canal flows released from Lake Okeechobee which do not impact WCA marshes) and (b) land taken out of agricultural use for construction of the treatment systems.

7) The long term average performance of the STAs is predicted using water and phosphorus balances which consider watershed inflows, direct rainfall on STA surfaces, evapo-transpiration, atmospheric phosphorus loads, phosphorus uptake, and outflows.

Estimated STA Performance:

Based on overall phosphorus loads and flows estimated to result from implementation of the STAs and BMP program, the combined flow-weighted mean concentration in discharges from S5A, S6, S7, S150, and S8 will be reduced from 168 ppb to 50 ppb. Accordingly, the STAs are located and sized to deliver a uniform long term annual flow-weighted mean concentration of 50 ppb or less at each inflow point to the EPA. Accomplishment of this objective will provide an overall load reduction of approximately 80% from the EAA into the EPA and a load reduction of at least 85% from the EAA into the Refuge. The District shall take mitigation measures such as declaring a water shortage, implementing supply side management, releasing water from Lake Okeechobee, reducing water retention in the EAA or adding flow from east of the EPA to offset flow reduction to the EPA.

STA Size Estimates:

Table 1 provides an estimate of the effective treatment areas of STAs. The sizes and configurations of STAs are designed to achieve an outflow concentration of approximately 50 ppb at each STA outflow point. These STA acreages and the BMP Regulatory Program provide the control programs which are anticipated to meet both the interim and long term Refuge and Park phosphorus limits and concentration levels. However, notwithstanding implementation of these control programs, if the Park or Refuge phosphorus limits or concentration levels are violated, then additional remedies will be taken, such as expansion of STAs, more intensive management of STAs, a more stringent EAA Regulatory Program, or a combination of the above. The State Parties shall not implement more intensive management of the STAs as the sole additional remedy.

Table 1. STA Effective Area

Basins Treated	STA	~~Approximate Total Acres to be Purchased~~	Approximate Effective Treatment Acres	
S5A, C51W	STA-1W	~~12,500~~	~~11,800~~	6,670
C51W, S5A	STA-1E			5,350
S6, S5A, 298	STA-2	~~4,000~~	~~3,700~~	6,430
S7, S8, 298, C139, L.O.	STA-3/4	~~5,270~~	~~4,950~~	16,660
C139	STA-5			4,530
S-8	STA-~~4~~6	~~12,930~~	~~12,150~~	812
TOTAL:		~~34,700~~	~~32,600~~	40,452

Operational Considerations:

Operational flexibility may be required, in order to divert flows from one basin to another (e.g. S8 & S6 to STA-3) in order to make optimal use of the total effective treatment area of wetlands within the STAs and distribute water of uniform phosphorus

concentration across EPA inflow points. The sizes and configurations of STAs 2, 3/4, 5, and ~~4~~ 6 may be adjusted, after a more detailed engineering analysis of the system has been completed. The total acreage of these ~~three~~ four STAs will not be reduced. This analysis will determine optimal methods for routing water within and between the S-6, S-7 and S-8 basins to make most effective use of the STAs and to ensure that all of the runoff is treated. ~~STAs 2, 3, and 4 will be operational by July 1, 1997. With respect to STA 1, 7,400 acres of effective treatment area will be operational by July 1, 1997. The District will construct an additional 4,400 acres of effective treatment area by July 1, 2002 if the year 2002 Refuge long term concentration levels or Class III criteria, whichever is lower, are not met by July 1, 2000.~~ The STAs will be operational by the following dates:

STA	OPERATIONAL DATE
1W	January 1, 1999
1E	July 1, 2002
2	February 1, 1999
3/4	October 1, 2003
5	January 1, 1999
6	October 1, 1997

The District will also design and implement control programs for other watersheds outside of the EAA discharging into the EPA, including L3, S140, L28I.

Sensitivity of Treatment Area (Acreage) to BMP Performance

The above treatment areas assume that the BMP regulatory program will achieve a 25% reduction in phosphorus loads from each basin. Table 2 lists the treatment areas which would be required

to achieve a 50 ppb concentration at EPA inflow points for other assumed BMP performance levels:

Table 2. Effective Treatment Areas (1000 Acres) Required to Achieve 50 ppb at EPA Inflow Points

		BMP Performance					
Load Reduction		0%		15%		25%	
Volume Reduction		0%		12%		20%	
~~S-5A~~	STA-1W	~~15.0~~	8.9	~~13.1~~	7.5	~~11.8~~	6.7
~~S-6~~	STA-1E	~~4.9~~	5.8	~~4.2~~	5.5	~~3.7~~	5.4
~~S-7~~	STA-2	~~6.7~~	7.8	~~5.6~~	7.0	~~5.0~~	6.4
~~S-8~~	STA-3/4	~~15.4~~	20.6	~~13.5~~	18.3	~~12.2~~	16.7
	STA-5		4.5		4.5		4.5
	STA-6		1.1		0.9		0.8
Total		~~41.9~~	48.7	~~36.4~~	43.7	~~32.6~~	40.5

If the BMP program achieves a 15% reduction in phosphorus load (instead of the assumed 25%), an additional ~~3,800~~ 3,200 treatment acres would be required to meet 50 ppb. If the BMP program does not achieve the predicted load reduction, up to ~~9,300~~ 8,200 additional acres would be required.

Control Program to Achieve Compliance with Class III Criteria

The research program will provide additional data to support the interpretation of Class III water quality criteria for the Refuge, Park, and the WCA's. Modification of the control program to achieve Class III criteria will reflect new information obtained in the research program and observed performance of the BMP's and STAs in the interim phase of the control program. Table 3 provides hypothetical estimates of the additional treatment acreage (beyond the ~~32,600~~ 40,452 acres prescribed in the above plan) which may be required to achieve discharge concentrations of 40, 30, and 20 ppb

total phosphorus for various levels of observed BMP and STA performance.

Table 3. Additional Effective Treatment Areas (1000 Acres) Beyond the Above Control Program (~~32,600~~ 40,452 Acres) Required to Achieve Total Phosphorus Discharge Concentrations

Observed BMP Performance Load Reduction		Observed STA Performance Phosphorus Settling Rate (m/yr) ~~Low~~ 6 m/yr	~~Expected~~ 8 m/yr	~~High~~ 10 m/yr
Total Phosphorus Discharge Concentration = 40 ppb				
None	0%	32.5	17.0	7.6
Low	15%	24.7	10.8	2.6
Expected	25%	19.2	6.5	-1.2
High	40%	10.6	-0.3	-6.7
Total Phosphorus Discharge Concentration = 30 ppb				
None	0%	45.4	27.1	15.7
Low	15%	36.5	19.9	10.1
Expected	25%	30.4	15.0	5.7
High	40%	20.5	7.2	-0.7
Total Phosphorus Discharge Concentration = 20 ppb				
None	0%	64.2	41.5	27.5
Low	15%	54.1	33.2	20.9
Expected	25%	46.9	27.4	15.7
High	40%	35.4	18.3	8.1

For example, if the BMP's and STAs perform according to ~~design~~ assumptions~~,~~ of a ~~(~~25% BMP reduction~~,~~ and a Settling Rate = 8 m/yr~~)~~, an additional effective treatment area of 15,000 acres would be required to achieve a total phosphorus discharge concentration of 30 ppb at EPA inflow points. If low performance is demonstrated for both controls (15% BMP reduction, Settling Rate = 6 m/yr), an additional treatment area of 36,500 acres would be required to achieve 30 ppb. Similar dependencies exist for other total phosphorus discharge concentrations.

APPENDIX D

RESEARCH AND MONITORING PROGRAM

The State Parties shall initiate a comprehensive, long-term, multi-agency cooperative research and monitoring program. Planning for this research and monitoring program will be completed within six (6) months after settlement and implemented according to a schedule established by the TOC. The State Parties shall primarily be responsible for the research and monitoring program with support from the United States. The National Park Service, the U.S. Fish and Wildlife Service, the USEPA and the Corps will assist in the research and monitoring. For example, funds available under section 319 of the Clean Water Act can be granted to the State Parties by USEPA in support of approved monitoring programs to assess effectiveness of BMPs and STAs.

RESEARCH PLAN

The research objectives will be to assess the current and continuing responses of the Everglades wetlands to nutrient inputs from cultural eutrophication, and to determine maximum levels of nutrients that will not cause imbalances in natural populations of aquatic flora and fauna (Florida Class III Water Quality Standards). Research to determine the Class III criteria for the Park, Refuge, and Water Conservation Areas shall begin no later than July 1, 1992, and final reports shall be completed no later than ~~July 1, 1997~~ December 31, 2001.

This program shall include the following minimum components to achieve the above objectives:

1) Initiate, develop, collect appropriate additional data for and complete detailed modeling efforts to measure quality and quantity impacts of system operation and alternatives for the purpose of improving water quality in the Everglades system. Detailed nutrient modeling for the Refuge, Water Conservation Areas (WCA's), Park, C-111 Basin and Northeast Shark River Slough shall incorporate the best available scientific information on nutrient dynamics (including peat accretion rates; soil uptake kinetics; macrophyte and periphyton uptake kinetics; and total phosphorus transport mechanisms, including storage and transport in shallow seepage) to determine the fate of introduced nutrients and trends. Similar budget models must be prepared for Stormwater Treatment Areas (STAs), with emphasis given to the interrelationships between water management and water quality in determining the effectiveness of these systems. Each model shall be designed to predict changes in outflow water quality likely to result from changes in inflow water quality and quantity in the WCAs and to predict and assess the long-term success of nutrient management strategies in achieving water quality criteria.

2) Develop a research program to determine the existing conditions and if additional damage in the Refuge and Park marshes has occurred due to interim delivery levels of total phosphorus or if reversals of damage are evident.

3) Develop a program that will include experimental approaches to interpret the Class III nutrient criterion

regarding imbalances of flora and fauna. Determine if concentration standards provide sufficient protection against imbalance or whether limitations on phosphorus loads into the Park and Refuge are required. An array of indices will be used to measure sensitivity of the ecosystem to small changes in nutrients. These will include nutrient cycling processes and the basic components of the Everglades ecosystem, such as periphyton, and other sensitive indicators of nutrient enrichment.

4) Contingent upon availability of leased or private lands, develop and initiate research to measure performance and improve field efficiency of BMPs. During implementation, control areas (with conventional cropping systems) should be used to determine BMP effectiveness in controlling total phosphorus losses and water reductions. Water sampling design must allow for close monitoring of performance of the individual management practices and represent the range of all field conditions. Performance results will be used to shape further development of management options, and further training of farmers, if needed.

MONITORING PLAN

The monitoring program shall include water quality and biological monitoring at interior marsh stations and downstream of all structures discharging into the Refuge, WCAs, and Park, including the Holeyland, Northeast Shark River Slough, Taylor Slough and C-111 Basin. The objective of the monitoring is to

measure effectiveness of the total phosphorus limits and concentration levels and document evidence of further disturbances, or recovery processes, in the Refuge, Water Conservation Areas, and Park.

This monitoring program shall conform to the following minimum requirements:

1) Water quality monitoring shall include timely data on flows, stages, routine water quality parameters, pesticides/herbicides, and heavy metals. This may necessitate use of provisional or unofficial data for calculation of flows, stage data, and flow weighted calculations. Actual values may change after verification. All water control structures for the Refuge, the Park, and the WCAs will be monitored, as is done by the present SFWMD CAMB, ENP, and LEC programs. Monitoring will be extended to any new water control structures added to the delivery system. The monitoring program shall include water quality sampling every other week at all Park and Refuge delivery points and at representative internal marsh stations including monthly sampling at the 14 permanent Refuge stations. The District's current water quality monitoring program shall continue with emphasis on total phosphorus, orthophosphate, ammonia, nitrate/nitrite, total nitrogen, chlorophyll-a, alkaline phosphatase, physical parameters, ions, heavy metals (especially mercury), and pesticides/herbicides. A plan for limiting pesticide/herbicide and heavy metals analysis to a

range of representative compounds and sampling locations can be considered.

2) In order to adequately assess Refuge and WCA nutrient inputs and outputs and Park nutrient inputs, the monitoring program shall include water quality monitoring of discharges at all relevant structures, monitoring of the nutrient content of atmospheric deposition in the Everglades system and monitoring of agricultural discharge quality. Atmospheric deposition will be monitored at selected sites in the EAA, WCAs, the Refuge, and the Park. The same field sampling and laboratory protocol will be employed at all sites.

3) Monitoring shall be implemented to identify variation (temporal and spatial) in biological and water quality parameters along transects in the WCAs, Park, and Refuge originating at major surface water inflow points and continuing along flow gradients. This must include representative transects in Shark River Slough, Taylor Slough, and in background areas of the Park and Refuge. Parameters monitored will include, at a minimum: routine water quality parameters in surface water samples; soil nutrient content, redox potential, and phosphatase activity; including major indicators of periphyton community composition, macrophyte nutrient content and macrophyte community composition.

4) All monitoring programs must have a DER approved QA/QC plan in place within 9 months of the date of this Agreement. Any proposed changes in field sampling protocol or laboratory

procedure must be justified and brought to the attention of the TOC for approval before implementation. The sampling designs, frequency, analytical methodology, and QA/QC protocols employed in the monitoring program shall be subject to mutual acceptance by all parties. The overall objective will be to maximize the accuracy and precision of the monitoring data, while insuring that any new sampling techniques or analytical procedures will not introduce biases relative to the historical monitoring data upon which the limits are based. The plan should include measurements of concentrations due to contamination during field sampling and processing as well as laboratory analysis, and comparison of these levels to interim and long-term standards.

REVIEW AND OVERSIGHT

The TOC will designate a panel for review, oversight and interpretation of the research and monitoring program. The purpose of this panel is to:

1) Review QA/QC documentation and requirements for consistency and approve modifications necessary to insure accuracy and quality of data collection, analysis, and interpretation,

2) Review and define suitability of measurement parameters and experimental designs,

3) Establish priorities within each component of research and monitoring program, and

4) Review any proposed monitoring and research for consistency with objectives as defined in these Appendices or recommend modifications to objectives, experimental design, and monitoring based on analysis of results.

APPENDIX E

EVERGLADES AGRICULTURAL AREA

REGULATORY PROGRAM

I. Background

A. The goal of the regulatory strategy is to reduce present total phosphorus loads from the EAA to each Stormwater Treatment Area (STA) by at least by 25% by February 1996. An interim target reduction of 10% in total phosphorus loads from the EAA will be required by February 1994.

B. The District will have all sources in the EAA under either individual or master permits by July 1993. All sources must comply with all permit conditions by February 1996. If permits are not issued by July 1, 1993 or compliance is not achieved by February 1996, the District will institute appropriate compliance and enforcement action.

C. Achieving a 25% reduction through the application of BMP's will require a regulatory program that includes at least the following elements:

1. Development and implementation of BMPs
2. Permitting
3. Monitoring
4. Enforcement

The basic concepts of the regulatory program are to maintain water levels elevated in the organic soils to reduce oxidation and release of phosphorus, and to apply only sufficient phosphorus to

maintain crop productivity and thereby eliminate excess phosphorus as much as possible.

D. Owners of contiguous land may submit a single application for a Master Permit; however phosphorus load allocations will be based on the basin and corresponding STA to which the land is tributary.

II. Implementation

A. The effective date of the rule should be no later than May 31, 1992, (based on rule adoption in April 1992) if the rule making process remains on schedule. Any challenges received will delay the effective date only by the amount of time necessary to complete the challenge process.

B. Permit applications must be submitted and completed in time for final agency action on them to take place by July 1993.

III. Conditions For Issuance for Individual or Master Permits.

A. An applicant entity must demonstrate enforcement authority and the ability to carry out all acts necessary to implement the terms and conditions of the permit.

B. The applicant will be required to not exceed the phosphorus load allocation as specified in section VI B. to be applied as a moving annual average. This requirement is in addition to successful implementation of the applicant's approved BMP program. Notwithstanding the BMP program, the applicant is still responsible for achieving the required phosphorus load allocation.

C. An applicant will be required to institute a BMP Program that will meet the required interim and long term phosphorus load allocations. Compliance with these load allocations should result in the interim and longterm (1996) target reductions of 10% and 25% respectively in total phosphorus load from the EAA being achieved. The BMP Program must include the following elements:

1. An acceptable fertility and water management plan for each crop, combination of crops or farming units.

2. An acceptable design for water management including field water management strategies, description of infrastructure, inter- and intra-operation water routing, probable volume and timing of discharge, and expected nutrient recovery. The application must include procedures for monitoring system performance.

3. An acceptable monitoring plan to verify BMP performance and implementation.

4. An acceptable schedule to begin implementing the BMP program and measuring compliance within one year of permit issuance. Fertility management planning and other operational management BMPs shall be in place by the fall of 1993. Structural changes shall be presented to the SFWMD in 1994 and installed by 1995. In order to achieve the load allocations all BMPs shall be operational by 1996.

5. An acceptable education and training program for management and operational staff to implement and monitor the approved BMP program.

6. The applicant can submit alternative BMP designs if they can be shown to be equally effective.

D. The applicant will be required to submit an acceptable water quality monitoring plan that documents:

1. Compliance with annual load allocation;

2. BMP implementation and operation;

3. BMP effectiveness (BMP research can be used to supplement data where appropriate);

4. Identification of high episodic phosphorus events.

The plan must monitor flow and total phosphorus concentration discharged from the permitted area on a continuous basis, as required by the District. Sampling must be conducted by qualified individuals, and samples must be analyzed by a certified laboratory with a DER approved QA/QC plan.

IV. Content of Application for Individual or Master Permits.

A. An application for a Master Permit must include information that demonstrates the applicant entity possesses the authority and the ability to carry out all acts necessary to implement the terms and conditions of the permit, including enforcement authority. At a minimum, the application must include:

1. Clear delineation of the area contained in the permit;

2. Interlocal agreements with municipalities and other entities of local government, as necessary;

3. Written contracts with landowners, as necessary.

B. Each application must include a BMP program with the following elements:

1. A fertility and water management plan for each crop, combination of crops or farming units.

2. A design for water management, including field water management strategies, description of infrastructure, inter- and intra-operation water routing, probable volume and timing of discharge, and expected nutrient recovery.

3. A monitoring plan to verify BMP performance and implementation.

4.An education and training program for management and operational staff to implement and monitor the approved BMP program.

5. A schedule for implementing the BMP program and monitoring plan within one year of permit issuance. The schedule must require fertility management planning and other operational management BMPs to be in place by the fall of 1993; structural changes to be presented to the SFWMD in 1994 and installed by 1995; and all BMPs to be operational by 1996.

6. Alternative BMP designs, if they can be shown to be equally effective.

C. A monitoring plan to provide for monitoring flow and total phosphorus concentration discharged from the permitted area on a continuous basis, as required by the District. The plan must provide for sampling to be conducted by qualified individuals, and for samples to be analyzed by a certified laboratory with a DER approved QA/QC plan.

V. Limiting Conditions

A. The permittee must successfully implement all elements and requirements of the approved BMP program.

B. The applicant must achieve the required phosphorus load allocation. Total phosphorus allocations (lbs/acre/yr) for permits within the S-5A, S-6, S-7 and S-8 basins will be calculated individually for each basin. Basin historical areal export rate for each basin will be calculated by dividing the basin (i.e. pump station) average annual total phosphorus load for Water Years 1979-88 (less the load associated with water supply deliveries to the Lower East Coast and less the load associated with the lands to be used for STAs) by the contributory area for each pump station. The contributing area will not include lands to be used for STAs and public preservation lands which are not actively drained. The 1994 interim load allocation will be calculated by multiplying the historical areal export rate by 0.90. The 1996 load allocation will be calculated by multiplying the historical areal export rate by 0.75.

C. The permittee must annually submit an implementation status report on their approved plan for achieving water quality objectives, and report results of water quality sampling and flow measurements.

D. The permittee must implement the monitoring program adequately to ensure that the following are documented:

1. Compliance with annual load allocation;
2. BMP implementation and operation;

3. BMP effectiveness (BMP research can be used to supplement data where appropriate);

4. Identification of high episodic phosphorus events.

Flow and total phosphorus concentration discharged from the permitted area must be monitored on a continuous basis, as required by the District. Quarterly and annual report of results must be submitted to the District. Sampling must be conducted by qualified individuals, and samples must be analyzed by a certified laboratory with a DER approved QA/QC plan.

E. Each permittee will be required to submit an annual report to the District summarizing BMP implementation and associated monitoring to evaluate BMP effectiveness. Each permittee will be required to submit a summary of required activities including BMP installation, BMP operation activities (pertinent to water management and nutrient management), water quality assurance audits, and intra-operation water quality checks. This summary will be produced for the appropriate operational scale.

F. Each permittee will be required to maintain appropriate records as part of the permit.

VI. Compliance and Enforcement

A. The intent is to identify critical problems before non-acceptable loads occur.

B. Compliance with total phosphorus load allocation will be determined by measuring flow and concentration at the applicant's property boundary, with adjustment for hydrologic variability with respect to the 10-year base period such as an adjustment for

rainfall made considering that year's rainfall versus average annual rainfall over the 10-year base period.

C. The District will audit BMP implementation by permittees. The District will establish reporting and monitoring protocols and will describe the audit procedure. Each permittee is required to maintain appropriate records as part of the permit.

D. The District will monitor:

1. Quantity and quality of water discharged by each permittee sufficient to verify with reasonable certainty that the permittee's monitoring program is adequate.

2. BMP performance at selected sites.

E. If a permittee exceeds its permitted areal phosphorus load allocation for February 1994 or 1996, the permittee shall:

1. Present a plan for monitoring all pumping and discharge facilities within the permitted area for flow and concentration on a continuous basis;

2. Submit a proposed compliance plan and schedule (including additional BMP designs) which will bring the permittee into compliance within 6 months.

3. The District shall review the plan and schedule, and:

a. If acceptable, will amend the permit accordingly;

b. If unacceptable will impose penalties or take whatever enforcement actions are appropriate, including but not limited to those set forth in Sections 373..044, 373.083. 373.119, 373.129, 373.136, 373.603, F.S., and Chapter 40E-1, F.A.C.

Section 373.044, F.S., authorizes the governing board to make and adopt reasonable rules, regulations, and orders which may be enforced by mandatory injunction or other appropriate action in the courts of the state.

Section 373.083, F.S., authorizes the governing board to issue orders to implement or enforce any of the provisions of or regulations adopted pursuant to Chapter 373, F.S.

Section 373.119, F.S., authorizes the executive director of the District to serve administrative complaint and orders prescribing corrective action whenever there is reason to believe that a violation of the provisions of or regulations adopted pursuant to Chapter 373. F.S., has occurred, or is about to occur. The order becomes final unless the person served requests a hearing within 14 days. The executive director, with concurrence of the governing board, may issue emergency orders requiring immediate compliance if they find that immediate action is needed to protect the public health, safety, or welfare.

Section 373.129, F.S., authorizes the department, the governing board, and any local board to commence actions in courts for the following purposes:

(1) To enforce rules, regulations, and orders;

(2) To enforce violations of the provisions of or regulations adopted pursuant to Chapter 373. Florida Statutes;

(3) To protect and preserve the water resources of the state;

(4) To defend actions pertaining to the water resources of the state;

(5) To recover civil penalties up to $10,000 per offense; Each date during which a violation occurs is a separate offense;

(6) To recover investigative costs, court costs, and reasonable attorney's fees.

Section 373.136, F.S., authorizes the governing board to enforce its regulations and orders by suit for injunction or other action in the courts of the state.

Section 373.603, F.S., authorizes the department or the governing board to enforce the provisions of and regulations adopted pursuant to Chapter 373. F.S., to the same extent as any peace officer is authorized to enforce the law.

Chapter 40E-1, F.A.C., contains general and procedural provisions adopted as rules by the governing board.

Part V of F.A.C. Chapter 40E-1 addresses decisions determining substantial interests (formal and informal administrative hearings). Part VI addresses permits. Section 40E-1.611, F.A.C., covers emergency action. Section 40E-1.612, F.A.C., covers administrative enforcement action.