UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUN 13 2012

MEMORANDUM

SUBJECT: Assessment of the State of Florida's Everglades Water Quality Plan

FROM: Gail Mitchell, Deputy Director
Water Protection Division

Philip G. Mancusi-Ungaro, Attorney-Advisor
Office of Environmental Accountability

THRU: James D. Giattina, Director
Water Protection Division

Mary J. Wilkes, Director and Regional Counsel
Office of Environmental Accountability

TO: Gwendolyn Keyes Fleming
Regional Administrator

On June 6, 2012, the Florida Department of Environmental Protection provided the Environmental Protection Agency with a revised permit responding to the EPA's National Pollutant Discharge Elimination System (NPDES) permit objection and an additional series of documents setting forth the State's Everglades plan (State's plan) for restoring water quality for the Everglades. The FDEP's submission included a draft NPDES permit that covered all five Stormwater Treatment Areas (STAs) and its attachments. The additional documents included a proposed enforcement consent order, a draft Everglades Water Quality Restoration Framework Agreement, the permit Fact Sheet and supporting materials.[1] The documents reflect discussions between staff and senior officials at the EPA and the FDEP over a period of months prior to the FDEP's submission to the EPA. Additionally, on June 8, 2012, the FDEP provided a replacement page correcting unintended scrivener's errors in the June 6, 2012, submission subsequently identified by the FDEP.

[1] The supporting materials include the following: 1) Exhibit A. Technical Support Document for Derivation of the Water Quality Based Effluent Limit for Total Phosphorus in Discharges from Everglades Stormwater Treatment Areas to the Everglades Protection Area. South Florida Water Management District Division of Water Resources. March 26, 2012; 2) Exhibit B. Restoration Strategies Regional Water Quality Preliminary Plan. Prepared by South Florida Water Management District. April 27, 2012 ; 3) Appendix C. Corrective Action Description and Details. Draft. June 4, 2012; and 4) Exhibit D. Downstream STA1W, STA1E, and STA2 Transect Monitoring Plan. Project Code: STAT. FDEP Consent Orders OGC# 12-1148/12-1149. March 26, 2012. Water Quality Bureau. South Florida Water Management District. (SFWMD-FIELD-MP-078-00); 5) June 5, 2012, legal opinion issued by the FDEP General Counsel to EPA Office of Water Legal Support.

The State's submittal reflects renewed efforts by the EPA and the State over the last two years to put in place a comprehensive framework for Everglades water quality restoration. On September 3, 2010, the EPA issued an Amended Determination (AD) to comply with Judge Alan Gold's April 14, 2010, order in litigation over revised water quality standards for phosphorus. Miccosukee Tribe of Florida et al. v. United States, No. 04-21488 & consolidated cases (S.D. Fla., April 14, 2010). As explained more fully below, the AD provided an enforceable framework for establishing a water quality based effluent limitations (WQBELs) and specific corrective actions and milestones to meet the WQBEL. Subsequently, the EPA has worked with the FDEP to ensure the State's plan would achieve the water quality and enforceability objectives of the AD

The EPA's AD provided comprehensive instructions on how, in the EPA's best technical judgment, Everglades water quality could be restored. The AD addressed a variety of aspects of water quality restoration that included:

1) Instruction to the FDEP on how revised water quality standards that the EPA had disapproved should be corrected.[2]

2) The EPA's assessment regarding the nature and extent of the non-attainment of the water quality criteria for phosphorus in the Everglades.

3) A two-part WQBEL for total phosphorus (TP) for incorporation into NPDES permits for STAs that would be as stringent as necessary to meet the phosphorus water quality standards in the Everglades.

4) Clear, explicit and comprehensive instructions on actions to achieve the WQBEL, in the form of a suite of remedial measures and specific milestones for implementing them.

5) Ambient monitoring to assess ongoing Everglades water quality.[3]

6) Instructions to the FDEP regarding how to conform the STA NPDES permits.

7) Explanation of how all of the AD components provided an enforceable framework.

8) A discussion of the important relationship between the AD and actions pending in different federal court litigation in United States v. South Florida Water Management District (SFWMD), No. 88-CV-1886 (S.D. Fla).

---

[2]Consistent with the Court's April 14, 2010, Order, the EPA, after offering the State the opportunity, proposed regulations identifying portions of the Phosphorus Rule and the Amended Everglades Forever Act that would not be applicable water quality standards for CWA purposes. The EPA proposed the regulations pursuant to the Court's April 14, 2010, order. The EPA also had requested the Court make certain changes to the Court's order prior to the EPA issuing final regulations. The District Court indicated it would amend its order but currently is awaiting a decision in the 11th Circuit Court of Appeals allowing the District Court to enter an amended order.

[3] Provisions for ambient monitoring are now incorporated into the FDEP enforcement consent order that require South Florida Water Management District to conduct monthly monitoring at a series of sites downstream of STA-1E, STA-1W and STA-2 in order to characterize the effects of the STAs' discharge on the receiving water bodies. EPA is initiating an effort known as the Regional Environmental Monitoring and Assessment Program (REMAP) to begin in 2013 to reassess the extent of TP pollution of the Everglades.

The AD offered the FDEP the opportunity to develop an alternative WQBEL and suite of remedies for the EPA review that were scientifically supportable and would meet the WQBEL as soon as practicable. Governor Scott responded to this opportunity with an initial water quality plan submitted to the EPA on October 6, 2011. Subsequent discussions between the EPA, the FDEP and the SFWMD in the ensuing months led to the expanded State plan that the FDEP submitted to the EPA on June 6, 2012.

Since the EPA issued the AD on September 3, 2010, additional permitting developments occurred. On November 2, 2010, within 60 days of the AD, the FDEP filed with the Court, permit documents intended to conform to the AD. In its notice transmitting the permits, the FDEP indicated that it lacked State law authority to issue permits without compliance schedules because the FDEP did not have "reasonable assurance" that the permittee would comply with the permit. After a December 17, 2010, Court hearing on the AD and based on further filings from the parties in the litigation, the Court issued an order on April 26, 2011, that deemed these permit documents to have been submitted to the EPA for the purposes of review under Clean Water Act (CWA) section 402(d), implementing regulations and the applicable NPDES Memorandum of Agreement (MOA) between the EPA and the FDEP. The EPA reviewed those permits and on June 27, 2011, objected to certain aspects of the permits. In response to the FDEP's September 23, 2011, request, the EPA conducted a public hearing on the objections on March 13, 2012. After consideration of comments received at the hearing, on May 7, 2012, the EPA affirmed its objections, but modified the terms of some of the objections.

The FDEP's June 6, 2012, submission to the EPA addresses and responds to the third (WQBEL), fourth (alternative remedial suite), fifth (monitoring), sixth (conformed permits), and seventh (enforceable framework) components of the AD. The revised permit submitted by the FDEP addresses our June 27, 2011, and modified May 7, 2012 objections. (See June 13, 2012, letter from Gwendolyn Keyes Fleming to Herschel T. Vinyard, Jr.). Our detailed assessment of the FDEP's response to the AD components regarding the WQBEL, the alternative remedial suite and the enforceable framework is described below. We believe that these aspects of the FDEP submission collectively would meet the water quality objectives of the AD, have a sound technical basis and establish an enforceable framework for ensuring compliance with the CWA and its applicable regulations.

I. Total Phosphorus Water Quality-Based Effluent Limit

In 2005, the FDEP adopted, and the EPA approved a numeric water quality criterion for TP for the Everglades Protection Area. The numeric TP water quality criterion is expressed as a long-term geometric mean (GM) of 10 parts per billion (ppb or micrograms per liter) in surface water. (Rule 62-302.540(4)(a), Florida Administrative Code (F.A.C.)) The 10 ppb GM criterion applies throughout the Everglades Protection Area, which includes the Arthur R. Marshall Loxahatchee National Wildlife Refuge, Water Conservation Areas (WCAs) 2 and 3 and Everglades National Park. The 10 ppb GM criterion represents the State of Florida's numeric interpretation of its narrative water quality criterion for nutrients, which states, "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." (Rule 62-302.530(47)(b) (F.A.C.)).

Where technology-based permit effluent limits are not adequate to meet the applicable water quality standards, including criteria, of a waterbody, the CWA and the implementing regulations for the NPDES

program require that NPDES permits include effluent limitations as stringent as necessary to meet water quality standards (see CWA section 301(b)(1)(C) and 40 Code of Federal Regulations (CFR) § 122.44(d)(1) and (5)). These limits are known as WQBELs. The NPDES regulations further require that WQBELs "derive from and comply with" all applicable water quality standards. (See 40 CFR § 122.44(d)(1)(vii)(A)).

The revised permit submitted to the EPA expresses the effluent limitation for TP as "shall not exceed: 13 ppb as an annual flow-weighted mean (FWM) in more than 3 out of 5 water years on a rolling basis; and 19 ppb as an annual flow-weighted mean (AFWM) in any water year." (NPDES permit at I.A.1). This effluent limitation is designed to be as stringent as necessary to meet the water quality standards for phosphorus in the Everglades.

The naturally nutrient-poor marshes of the Everglades are affected by both the concentration and the load of phosphorus. A "phosphorus load" is the amount (mass) of TP that results from the concentration of TP multiplied by the volume of water in which that concentration occurs. The loading of phosphorus is important to the ecosystem because the TP entering the Everglades remains within the marsh (for example, in soil and sediment) where it can continue to adversely affect aquatic flora and fauna and affect the TP concentrations observed in the surface water over the long-term. A WQBEL expressed as a FWM takes into consideration high loads from higher, more concentrated flows as well as lower loads from lower, less concentrated flows. Therefore, the TP WQBEL in the FDEP permit is being expressed as an annual FWM.

A. The WQBEL Derivation as Expressed by the EPA in the 2010 Amended Determination

In the 2010 AD, the EPA derived a WQBEL to be applied at STA discharges into the Everglades (AD Attachment G - WQBEL Technical Support Document). The AD expressed the WQBEL as "TP concentrations in the discharge may not exceed either: 10 ppb as an annual GM in more than two consecutive years; or 18 ppb as an annual FWM." The WQBEL was derived from the numeric 10 ppb TP GM criterion for the Everglades Protection Area, and was designed to apply the TP criterion directly to each STA discharge point. The objective of the WQBEL for TP in the AD was to ensure that the long-term 10 ppb criterion will be met at each STA discharge point as assessed over a short-term period (one year and three years).

The technical approach used in the AD to derive the WQBEL was based on STA performance data that were statistically re-scaled to simulate STA discharges at the long-term 10 ppb criterion. This two-part WQBEL allows for year-to-year variability in the TP concentration at the STA discharge that is consistent with the variability observed in surface water phosphorus at the Everglades Protection Area marsh reference sites, which were used to develop the numeric TP criterion.

The EPA considered the following in the development of the WQBEL in the AD:

a. STA performance data for 1994-2010 were used. The EPA screened the data to eliminate data from STAs that experienced conditions not considered to be representative of future STA conditions. This included the exclusion of data for STAs that were subjected to

hurricane damage, construction, phosphorus overloading or excessive water depths. After the screening, 50 data values were utilized in the WQBEL analysis.

b. A statistical approach was used to re-scale the data to represent an STA discharging at a long-term GM of 10 ppb.

c. The two-part WQBEL was to be applied to each STA on an annual water year basis (May-April).

d. The WQBEL was to be applied directly at the discharge point from each STA. The EPA did not consider changes in surface water TP concentration that might occur between the STA discharge point and the location where the discharge enters the marshes of the Everglades Protection Area. The EPA recognized that the Everglades marsh does not have a long-term net assimilative capacity above the TP criterion.

e. The derivation of the maximum annual limit was based on the 90th percentile of the distribution for STA discharge data adjusted to simulate an STA facility discharging at the long-term TP criterion of 10 ppb. This would mean that the STA would have a 10% risk (type I error) of being declared in violation of the maximum annual discharge limit when in fact, the STA is discharging at or below the long-term criterion. Use of the 90^{th} percentile is consistent with all previous discharge limits developed for Everglades STAs.

In the AD, the EPA stated that if an alternative approach to developing the WQBEL was provided, then the EPA would evaluate its scientific rigor to ensure it appropriately implements the numeric water quality criterion for TP in accordance with the CWA and its implementing regulations.

B. Assessment of the WQBEL Developed by the FDEP

The FDEP WQBEL was derived in order to assure that discharges from the STAs do not cause or contribute to exceedances of the 10 ppb TP criterion expressed as a long-term GM established under Rule 62-302.540, F.A.C.

The FDEP's technical approach to derivation of the WQBEL differs from the EPA's in three relevant ways. ("Technical Support Document for Derivation of the Water Quality Based Effluent Limit for Total Phosphorus in Discharges from Everglades Stormwater Treatment Areas to the Everglades Protection Area." the SFWMD, Division of Water Resources (March 26, 2012)). First, the FDEP screened the 1994-2010 STA performance data differently from the EPA screening used in the development of the AD WQBEL. The FDEP excluded from the data set annual FWM TP concentrations reported for each STA that exceeded 50 ppb because the original design for each STA was to discharge at 50 ppb as an annual FWM. The FDEP considered the resulting data to be more reflective of normal STA operations in the future. The FDEP screening resulted in 38 data points, rather than the 50 data points used by the EPA. Second, both parts of the FDEP WQBEL are expressed as a FWM, rather than the EPA's approach that expressed one part of the test as a GM. The FDEP demonstrated that a long-

term 10 ppb GM is approximately equivalent to 13 ppb as a FWM based on data from STA discharges. Third, the FDEP applied an assessment frequency of any three years within a five year time period rather than an assessment frequency of three consecutive years as applied by the EPA. While the FDEP's approach differs in several respects from the approach contained in the AD, the EPA found the technical determinations made by the FDEP in developing the alternative WQBEL to be reasonable and scientifically sound.

There were several important similarities in the FDEP's derivation of its alternative WQBEL and the EPA's, as follows: (1) The FDEP used the same statistical method to re-scale the STA discharge data; (2) the two-part WQBEL would be applied on an annual water year basis; (3) both parts of the WQBEL would need to be met; (4) the WQBEL would be applied directly at the discharge from each STA; and (5) the derivation of the maximum annual limit is based on the 90th percentile of the data distribution for STA discharge data that were adjusted to simulate an STA facility discharging at the long-term TP criterion of 10 ppb.

The EPA also evaluated the FDEP's assessment frequency of "13 ppb as an annual flow-weighted mean (FWM) in more than 3 out of 5 water years on a rolling basis" and found it to be as protective as the EPA's frequency of "10 ppb as an annual geometric mean (GM) in more than two consecutive years." In one important respect, the State's alternative WQBEL is slightly more protective than the WQBEL contained in the EPA's AD. When determining compliance, there is a risk that a facility will be found not to exceed the WQBEL, when it is, in fact, discharging above the long-term criterion. This is referred to as a false negative rate (type II error). The EPA evaluated the type II error rate for the two-part alternative WQBEL developed by the FDEP and found it to be slightly lower (i.e., more protective because fewer actual instances of non-attainment would go undetected) in the 12 ppb - 20 ppb GM range than the error rate for the two-part WQBEL developed by the EPA.

The WQBEL presented by the FDEP is as protective as the WQBEL developed by the EPA in 2010, and if implemented similarly, would be as stringent as necessary to meet water quality standards.

II. Remedial Projects - Design to Capture and Treat Flows Sufficient to Meet the WQBEL

A. Remedial Projects in the 2010 Amended Determination

In the 2010 AD, the EPA evaluated the need for additional phosphorus controls in three flow paths in order to attain the WQBEL in discharges to the Everglades Protection Area. The Eastern Flow Path was assumed to treat runoff from the Everglades Agricultural Area (EAA) S-5A basin and the L-8, C-51 East and C-51 West Basins. This water was to be treated by STA 1 East and STA 1 West, which discharge into Water Conservation Area 1, also known as the Arthur R. Marshall Loxahatchee National Wildlife Refuge. The Central Flow Path was assumed to treat runoff from the S-2, S-6 and S-7 EAA Basins. This water was to be treated by STA 2/Compartment B and STA 3/4, which discharge into WCA-2A and WCA-3A, respectively. The Western Flow Path was assumed to treat some runoff from the EAA S-3 and S-8 basins, as well as runoff from the C-139 and C-139 Annex Basins to the west. This water was assumed to be treated by the STA 5/6/Compartment C complex. The Eastern and Central Flow Paths also were assumed to treat a small amount of flow from Lake Okeechobee.

There are about 60,000 acres of STAs, including Compartments B and C, that are under construction or operational. STAs have been used for about 20 years to reduce the levels of phosphorus being discharged into the Everglades. STAs function better when the flow of water through them is relatively stable and water levels are maintained. When STAs dry out and are then re-wetted, phosphorus can be released from the soils and re-enter the surface water. Flow Equalization Basins (FEBs) are shallow or deep water storage areas that are designed to store water that can later be delivered to the STAs to better maintain water levels and vegetation, and thus, optimize STA performance.

The EPA used the best available STA phosphorus removal performance model (DMSTA2 2005 version) to predict the combination of STA and/or FEB acreage that would allow the WQBEL to be met. The DMSTA model was developed in 2001, has undergone several enhancements and has been routinely used by federal and state agencies for STA design and evaluation. The AD described the model, model input, assumptions about the inflow water volume and TP concentrations to be treated and the P removal efficiency of the FEB and STA systems (AD, Attachment H, Assumptions and Modeling Report).

The size of the STAs and/or FEBs that the EPA predicted would be needed to meet the WQBEL is based on many factors and assumptions that are identified in the AD. Key factors include the volume of flow to be treated and the concentration of TP in these flows. The AD relied on the following assumptions:

- The flows to be treated were derived from the South Florida Water Management Model restoration strategies baseline scenario (RSB2X2) with daily simulation of 1966-2005 hydrologic conditions.
- STA inflow concentrations, volumes and loads were based on 2005-2009 data.
- No further reductions in TP concentrations or source controls were assumed at the inflows to the STAs and/or FEBs for any flow path beyond those that were in place during 2005-2009.
- Some Lake Okeechobee water was treated.
- All of the L8 Basin flow was treated in the Eastern Flow Path.
- C-139 Annex flow was treated in the Western Flow Path.

Based on these assumptions, the modeling predicted that the following projects would be needed in order to achieve the WQBEL at each STA discharge:

- A 15,000 acre expansion of STA effective treatment area for the Eastern Flow Path;
- A 15,600 acre STA expansion in the Central Flow Path; and
- A 7,000 acre FEB (12 feet deep with 84,000 acre-feet of storage) in the Western Flow Path.

The total footprint for these expansions was projected to be 30,600 acres of STA and 84,000 acre-feet of storage in an FEB. The EPA projected the outflow TP level from each flow path to be a long-term FWM

of approximately 11.5 ppb. The EPA noted in the AD that there may be other project designs that could meet the WQBEL and invited the SFWMD to submit an alternative plan.

B. Assessment of the Remedial Projects in the 2012 State Plan

The 2012 revised NPDES permit, associated documents and draft enforcement consent order between the FDEP and the SFWMD submitted to the EPA include corrective actions and deadlines to achieve the WQBEL. The permit also references a document entitled, "Restoration Strategies Regional Water Quality Preliminary Plan, April 27, 2012," that provides a description of the corrective actions and the evaluation tools and assumptions upon which the corrective actions are based. The corrective actions to be implemented by the SFWMD would include an additional 7,300 acres of STAs and FEBs that would store approximately 110,000 acre-ft of water.

After issuance of the 2010 AD, the State updated and revised some of the flow data and hydrologic modeling upon which the EPA had relied in developing the projects for the AD. The State plan assumed a slightly lower volume of water to be treated, and relied upon different assumptions regarding the TP concentrations in the water to be treated. Also, the availability of a large storage reservoir in the Eastern Flow Path resulted in a different approach in the State's alternative plan. Some of the evaluation tools and modeling assumptions that the State relied upon that are different than those relied upon by the EPA include:

- A refinement to the DMSTA modeling where annual values less than 12 ppb (FWM) were replaced with a value of 12 ppb due to the uncertainty associated with DMSTA-simulated low level annual concentrations.

- Flows to be treated were derived from an updated South Florida Water Management Model restoration strategies baseline scenario (RS_BASE2) which incorporated the updated regional model with improvements to represent observed trends and future regional projects.

- A 2000-2009 period of record for TP concentrations, rather than the 2005-2009 period of record upon which the EPA relied in the AD. This resulted in lower TP concentrations assumed to be treated at the STAs.

- For the Eastern Flow Path, in order to reflect current operations, the SFWMD assumed that less L-8 flow would be treated, and instead assumed diversion of some of this flow eastward via the C-51 Canal.

- A reduction of about 35% in the TP loads from the C-139 Basin in the Western Flow Path to be treated by the STAs based on implementation of a 2010 best management practices (BMP) rule which became effective after the AD.

- Revised estimates of flow from the C-139 Basin that would be discharged into the FEB/STA system for treatment.

- For the Western Flow Path, the C-139 Annex water would not be treated in the FEB/STA system.

The State projected the outflow TP level from each flow path to be a long-term FWM of approximately 13 ppb, which as noted above, has been calculated to be equivalent to the long-term criterion of 10 ppb GM. These different assumptions resulted in the alternative remedies in the State plan.

Eastern Flow Path

The State plan differs in that it would include an 45,000 acre-foot FEB (about 950 acres) and two STA expansions that would total 6,500 acres, rather than one large STA expansion of 15,000 acres as recommended by the EPA in the AD. In the AD, the EPA had evaluated an alternative project design that included a 44-foot deep 1,700 acre FEB with an 8000 acre STA. The EPA did not recommend this project design due to uncertainty about whether a site for a large storage reservoir could be identified or was feasible (particularly given the proximity of urban development). The State has since identified a suitable FEB site.

Central Flow Path

Both the AD and the State plan rely on use of the 15,000 acre A-1 site to store or treat water. The AD proposed that the A-1 site would be designed as an STA to maximize phosphorus uptake. The State plan would utilize the A-1 site as a 54,000 acre-foot FEB to better manage and meter water flow and phosphorus load discharged into STA 3/4 and the STA 2/Compartment B complex. However, water depth in the shallow FEB (approximately 4 feet of water) is projected by the State to support vegetation that is likely to aid in the removal of additional phosphorus.

Western Flow Path

The AD recommended a 7000-acre, 12-foot deep FEB with 84,000 acre-feet of storage. The State plan would include a shallower FEB (4 feet) with 11,000 acre-feet of storage (with a footprint of up to 2,800 acres), and then would include a "a scrape down" within STA 5 to increase the effectiveness of existing (but non-performing) treatment area within it, representing a functional addition of 800 STA acres.

C. **Summary**

In predictive modeling for a large scale water quality restoration effort such as this, many assumptions must be made. The State had available to it new data and information and options that were not available to the EPA at the time of the AD. These additional data and information included: more recent data and information on flows and phosphorus levels in the inflows to the STAs; options to reduce flows to be treated in the STAs (including an environmental restoration plan for the C-139 Annex); the implementation of a new BMP rule for the C-139 Basin; the availability of a deep storage reservoir in the Eastern Flow Path; and water management operational improvements to optimize FEB and STA performance. After extensive technical discussions with the SFWMD and the FDEP and thorough evaluation, the EPA concluded that the State plan is based on an appropriate set of assumptions given the information available at the time the plan was developed. Based on these assumptions, in

combination with the science plan and enforceable framework described below, the State plan can reasonably be expected to achieve the WQBEL.

III. Monitoring, Science Plan and Opportunities for Adaptive Management

The monitoring provisions in the permit and consent order and the science process in the consent order are designed to provide the level of information needed to assess and evaluate the performance of the existing and proposed remedies, as well as any new scientific information. The EPA believes that the monitoring and science process will provide a foundation for examining whether progress toward the WQBEL is occurring at the pace expected and, if not, to identify mid-course corrections needed to ensure its achievement.

A. Consent Order Reporting Requirements

Recognizing that discharges from the STAs are not currently predicted to achieve the WQBEL until the corrective actions are completed, the proposed consent order would require frequent reporting that would allow new data and information on STA performance to be considered as the corrective actions are implemented. The proposed consent order would require the SFWMD to submit to the FDEP and the EPA weekly STA performance summaries that identify inflow volumes, inflow FWM TP concentrations, outflow volumes, outflow FWM TP concentrations for the prior 7-day, 28-day and 365-day period of record, as well as inflow and outflow TP loads for the prior 28-day and 365-day period of record. The weekly reports to be submitted also would include the 365-day loading rate; 6-month trend in outflow TP concentrations; and concentration, load and flow in comparison to the period of record observed conditions. The consent order would also require downstream monitoring to assess the effect of the discharges on the Everglades.

B. Permit Monitoring and Reporting Requirements

The revised permit includes a specific suite of monitoring provisions to require reporting of STA performance twice a year (six month and annual TP FWM). These provisions would become effective once the corrective actions under the consent order for a given flow path are completed. The requirement for mid-year monitoring and the requirement to report would provide an early warning to assess whether each component of the WQBEL will be met at the end of each water year. If the discharge is above either the 13 ppb or 19 ppb WQBEL component at the mid-year, the SFWMD would need to assess the conditions responsible for the observed concentrations and identify any immediate responsive steps to be taken. Similarly, at the end of the water year, if either the 13 ppb or 19 ppb component of the WQBEL is not achieved, the SFWMD would need to conduct an assessment of the conditions that led to the exceedance, report on the actions taken as a result of the mid-year assessment and develop a Recovery Plan that identifies specific strategies and milestones to address future compliance with the WQBEL.

C. Science Process

Under the proposed consent order, the SFWMD would be required to develop and implement a Science Plan to identify the factors that collectively influence phosphorus reduction and treatment performance

in order to meet the WQBEL. The Science Plan would be developed in consultation with representatives designated by the FDEP and the EPA. Such designated representatives may be from federal agencies in addition to the EPA. After consulting with the representatives, the SFWMD would be required to:

(1) identify the critical information gaps and research areas that influence treatment performance; (2) prioritize the science needs; (3) develop and implement the Science Plan; (4) evaluate the results of the ongoing scientific efforts to meet the prioritized science needs; (5) modify the Science Plan as needed based on results of completed or ongoing scientific studies; and (6) determine how the results of the scientific studies could be implemented to improve phosphorus reductions and treatment performance. Of particular interest is a better understanding of design and operations that sustain outflow concentrations at low phosphorus concentrations (<20 ppb).

Key areas that would be considered for further scientific studies include the effect of the following factors on STA performance: phosphorus loading rates; inflow phosphorus concentration; hydraulic loading rates; inflow water volumes, timing, pulsing and peak flows; water depth; phosphorus speciation at inflows and outflows; effects of microbial activity and enzymes on phosphorus uptake; phosphorus re-suspension and flux; the stability of accreted phosphorus; phosphorus concentrations and forms in soil and flocculent; soil flux management measures; influence of water quality constituents such as calcium; emergent and submerged vegetation speciation; vegetation density and cover; weather conditions such as hurricane and drought; and the inter-relationships between those factors. The science process would also assure that the STA performance modeling tools, such as DMSTA, and any efforts to re-calibrate the model, will reflect the most recent data and knowledge about STA performance. The EPA expects the complex scientific process of model re-calibration, as well as results generated by a re-calibrated model, would be the subject of discussions with the science representatives.

The State and federal representatives would perform technical functions such as: (1) information gathering and fact-finding regarding scientific studies presented to them; (2) evaluation and comparison of the results of the scientific studies through identification of positive, neutral and negative impacts of any options presented in the results of the scientific studies; (3) provide expert technical opinions regarding viability and outcomes of any options presented in the results of the scientific studies; (4) provide technical opinions on STA interim operational data with regard to observed water year conditions and resulting phosphorus reductions; and (5) assess water quality and progress in achieving the deadlines in the consent order. The representatives would not vote or make any consensus recommendations to the SFWMD or make any decisions regarding matters that are presented. The science process assures open communication regarding the science of Everglades water quality restoration, including whether and how to act in light of evolving science. The representatives would use the information gathered from the SFWMD, including the scientific studies and the interim operational performance information, to inform their respective agencies as to how the information could be utilized to optimize phosphorus reduction and treatment performance.

The SFWMD would be required to convene regular meetings of the representatives as often as needed, but no less than once every six (6) months. The SFWMD would present relevant information to the State and federal representatives before this semi-annual consultation to ensure that the representatives have adequate time to review and have informed technical discussions during the semi-annual meetings.

Based on the discussions during the semi-annual meetings, the SFWMD would determine what, if any, operational changes may be implemented to ensure compliance with the Operational and Pollution Prevention Plans.

Under the proposed consent order, the first meeting of the representatives would take place no later than six (6) months after the date of permit issuance. The SFWMD would be required to develop a detailed Science Plan including a work plan and schedules within nine (9) months of issuance of the permit. The SFWMD also would need to initiate studies and research identified in the work plan within twelve (12) months of issuance of the permit.

D. Twice Annual Meetings of Agency Principals to Resolve Outstanding Issues

In addition to the regular meetings of the science representatives, the EPA and the FDEP would also enter into an agreement where the Regional Administrator for the EPA, Region 4 and the Secretary of the FDEP (the Principals), and appropriate staff as needed, will meet twice annually to discuss Everglades water quality conditions and progress toward attainment of water quality standards until each of the STAs meets the WQBEL. One or both of the Principals could invite the SFWMD Executive Director to these meetings, including appropriate staff as needed. The Principals will discuss the Everglades water quality conditions including: TP concentrations and loads entering each of the STAs; TP concentrations and loads discharged from or diverted around each of the STAs; results of downstream monitoring; the progress of the SFWMD in achieving the corrective actions; and enforcement matters.

The purpose of the Principals' meeting is to also pursue resolution, as necessary, on any differing technical opinions of the federal and state science representatives including any recommended changes identified by the science representatives to the existing remedies or new remedies.

E. Summary

The monitoring and science process provisions under the proposed consent order, the revised permit, and the Framework Agreement establish a process where important data and information can be considered and discussed at the highest levels of the agencies, with the intent to resolve any issues related to the ultimate compliance with the WQBEL. These provisions indicate the commitment of the SFWMD, in consultation with the EPA and the FDEP, to conduct ongoing evaluations, including how the results of the scientific studies could be implemented to improve phosphorus reductions and treatment performance. The enforceable framework discussed below provides the EPA and the State the opportunity to continue discussions on any unresolved issues.

IV. Enforceable Framework

The EPA has worked with the FDEP and the SFWMD to ensure that an enforceable framework is put in place to assure prompt and expeditious action towards, and accountability for, attainment of the TP WQBEL through: (1) a permit that includes an effluent limitation as stringent as necessary to meet the water quality standard for phosphorus; and (2) an enforcement order detailing the objective milestones

and deadlines designed to meet the WQBEL. Taken as a whole, the revised permit, the proposed consent order and the FDEP's commitment under the Framework Agreement between the FDEP and the EPA as discussed below would establish an effective framework for enforceable restoration of Everglades water quality and thus, assurance that the longstanding water quality impairment can and will be remedied.

First, the revised NPDES permit would include a WQBEL for TP that becomes effective and enforceable upon permit issuance, as well as project actions and deadlines that are enforceable under the NPDES permit independent of the WQBEL. The revised permit provides:

> The water quality based effluent limitation (WQBEL) for phosphorus in Section I.A.1 of this permit becomes and remains effective and fully enforceable upon the date of issuance of this permit and during implementation of the corrective actions in Paragraph 10 of the Order.

And that:

> The corrective actions and associated deadlines in paragraph 10 of the Order [when effective] are hereby incorporated by reference and are considered specific and independently enforceable conditions of this permit.

It is recognized in the consent order (including its projects and schedules) that it "does not alter the obligation to comply with the WQBEL for phosphorus in Section 1.A.1 of the permit upon its effective date," even though the "effluent from the STAs is not predicted to achieve the WQBEL for TP until completion of the corrective actions [specified therein]."

Once final, the revised permit would be different from prior STA NPDES permits in the clarity of the obligations imposed. Prior permits included only a placeholder value for the WQBEL (specifically, the numeric water quality criterion) that did not come into effect because the permits were accompanied by Administrative Orders that superseded and replaced the WQBEL compliance obligation under the permit with monitoring requirements applicable to the STAs at differing "operational phases," after which compliance with a "technology-based effluent limit" rather than a WQBEL would apply. The revised permit would no longer rely on operational phases or technology-based limits, but instead require compliance with a clear, fixed and technically defensible permit limit derived to be as stringent as necessary to meet water quality standards. As such, the revised NPDES permit would provide the EPA with authority to oversee compliance, and if necessary, take enforcement action should the SFWMD fail to implement the required corrective actions or should the State's plan fall short of achieving the WQBEL. The EPA's retention of enforcement authority (of the specified corrective actions and deadlines, as well as the WQBEL directly) provides a critical federal backstop to ensure that the SFWMD continues apace with the remedial measures in the State plan.

Second, the proposed consent order also would represent a significant change in establishing a prescriptive accountability regimen.The remedial measures are identified with specificity and include enforceable interim deadlines. The final deadlines represent dates by which the corrective actions designed to achieve compliance with the WQBEL would be fully operational.

Because the SFWMD would consent to the corrective actions and deadlines under the proposed orders, the necessary remedies can begin quickly, without extended disputes and litigation over that vital remedial activity. As explained above, the Science Plan in the proposed consent order memorializes the SFWMD's commitment to ongoing evaluation.

Third, the Framework Agreement includes other important commitments through which the FDEP will exercise responsibility for assuring Everglades water quality restoration for purposes of, and consistent with, the CWA. Under the Agreement, the FDEP commits to take prompt final action to issue NPDES and Everglades Forever Act permits and accompanying consent orders to the SFWMD for discharges from the STAs, as well as other efforts to sustain momentum toward conclusion of matters under State law. By agreeing to file a motion to stay its 11th Circuit appeals, the FDEP can focus on the important task of establishing the enforceable framework without undue interruption or delay due to litigation. Like the revised permit and proposed consent order, the Framework Agreement also acknowledges that:

> USEPA retains the authority under the CWA to take direct enforcement action for any alleged violation of the FDEP-issued NPDES permit.

Though the EPA retains this authority, the Agreement recognizes and preserves the existing relationship between the EPA and the FDEP (and every other state authorized to administer the NPDES permitting program) relating to federal enforcement in authorized states. The Framework Agreement memorializes a process under which the Secretary of the FDEP and the Regional Administrator for EPA Region 4 would meet to discuss and to seek to resolve any disagreements relating to whether and what actions should be taken to remedy non-compliance, including modifying existing remedies or adding additional remedies Though such meetings would be consistent with the "no surprises" approach in a 1986 EPA policy captioned "*Revised Policy Framework for State/EPA Enforcement Agreements,*" they would not impair or interfere with the EPA's authority to take enforcement action for violations of the WQBEL and/or the corrective actions and deadlines in the proposed order or revised permit including modifying existing remedies or adding additional remedies if it appears necessary to do so to meet the WQBEL.

The Framework Agreement includes the EPA's acknowledgement that the NPDES permit and consent order, which are attached to the Agreement, represent timely and appropriate enforcement action[4] by the FDEP based on the information provided to the EPA by the FDEP and under present circumstances, assuming that the NPDES permit and consent order are expeditiously issued and finalized with no substantial changes after public participation. The acknowledgement that finalization of the permit and order is timely and appropriate is based on present circumstances, including, but not limited to, our scientific understanding of the phosphorous treatment actions under consideration, as well as economic and other pertinent factors. The EPA retains the authority, based on new information or changed circumstances, to determine that revisions to the remedial scheme developed by the State may be

[4] Under the Memorandum of Agreement between the EPA and the FDEP, the responsibility for enforcing violations depends on whether the State's action is "timely and appropriate." "Timely and appropriate" is defined in the NPDES MOA. In instances where the EPA determines that the FDEP has not taken or completed a timely or appropriate enforcement action, the EPA may proceed with any or all CWA enforcement options available to it.

necessary to achieve expeditious compliance with the WQBEL. The EPA retains this authority even though the consent order remains in effect between FDEP and SFWMD.

The EPA has closely reviewed the schedule that the State proposed in its submittal of the revised permit documents. The schedule is longer than the 10-year schedule in the AD, which assumed that work would begin in 2010. The AD schedule was based on constructing 30,600 acres of STAs and 84,000 acre-feet of FEBs and did not consider funding issues. It was assumed that money and technology would be available. The Governor's 2011 plan also proposed a 10-year schedule, to begin in 2012 and be completed in 2022, for a different suite of projects using a combination of STAs and FEBs. The State then modified and strengthened the Governor's Plan based on discussions with EPA, resulting in an expanded suite of remedies, including an additional 7,300 acres of STAs and FEBs that would store approximately 110,000 acre-ft of water. Under the final State plan incorporated in the revised permit, work would begin immediately in 2012, but would extend until 2025 depending on the flow path, resulting in a 13-year implementation schedule.

The EPA has had a number of discussions with the State on the schedule. The State bases its projected schedule on engineering considerations as well as its current financial situation, projected cash flows and other factors. Although the EPA would prefer a more expedited schedule, the State has represented that financial and manpower constraints created limitations on its ability to fund and design multiple projects at the same time. More recently, the State indicated that there is a technological constraint in one flow path. Specifically, the State explained that it intends to learn from the design and operation of the FEB in the Central Flow Path before designing the FEB in the Western Flow Path.

Due to limitations on borrowing, the State has chosen to finance the work on a "pay as you go" basis, and has informed the EPA that it does not have the resources to build all projects at once. Implementing the remedies involves land acquisition, complex engineering and design issues and large scale construction projects. It also includes a technology new to the Everglades, FEBs, which will be used to control the flows into the STAs. The FEBs will require new design and engineering techniques. As noted, the State has also indicated it has limited personnel resources that would restrict its ability to design and work on multiple projects at the same time.

The EPA remains hopeful that future improvements in the economic outlook and improved technical understanding will provide opportunities to complete the remedy projects earlier than the proposed deadlines. Notably, under the consent order, the SFWMD "commits to expediting the corrective actions set forth in Paragraph 10, to the maximum extent practicable while fulfilling its other agency responsibilities, in an effort to incrementally improve water quality discharges into the Everglades." Although the EPA is deferring to the State on the schedule, based on its knowledge of its financial condition and staffing, the EPA will continue to discuss the implementation timetable with the State and, if the financial situation changes and/or technical knowledge and manpower issues allow, identify opportunities for the schedule to be accelerated.