

DRAFT (9/17/03)

**Detailed recommendations to Consent Decree Principals regarding TOC July 24,
2003 consensus letter**

e. Identify, evaluate, and implement additional source-control measures (e.g., enhanced BMPs, additional treatment area) required to reduce EAA runoff and Lake phosphorus loads to levels that are consistent with the STA design basis and the expected BMP performance. Lead: SFWMD Cost: TBD

STA PERFORMANCE
Water Years 2002-2003

	STA – 1W	STA- 2	STA-5	STA 6	ALL STAs
Water Year 2002 Inflow Concentrations	148	77	244	69	134.5
Water Year 2002 Outflow Concentrations	38	16	78	16	37
Water Year 2003 Inflow Concentrations	154	67	277	77	143.75
Water Year 2003 Outflow Concentrations	53	17	136	26	54
Water Year 2002 Concentration Reductions	73.4%	79.2%	68%	88%	77.15%
Water Year 2003 Concentration Reductions	65.6%	74.7%	51%	66.3%	64.4%
Average Concentration Reduction	69.5%	76.95%	59.5%	77.15%	70.77%

BMP's - Causal link Missing

“Thus far *the relationship between the EAA basin-level phosphorus reductions and the farm-level BMP plans has not been established.* The EAA Basin level data verify that the individual farms have collectively reduced phosphorus loads coincident with BMP implementation. However, the data collected to date do not establish a direct statistical relationship between the water quality from an individual EAA farm or subset of farms and the EAA Basin as a whole because of the many variables affecting phosphorus load at the farm level.” (Page 3-19, 2002 Everglades Consolidated Report)

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BMP Point Values are Arbitrary

“IFAS data indicate nutrient control practices may potentially reduce P load from 0 to 40 percent, while water management BMPs may yield from 0-to 90-percent P reductions for individual farms.”

“The equivalent points assigned to each BMP, shown in **Table 3-1**, *do not directly correlate to individual BMP effectiveness*. Points were originally based on the review of numerous reports and publications produced by UF/IFAS and on best professional judgment and cooperative workshops conducted among affected landowners, consultants, District staff and the general public.” (Page 3-5, 2003 Consolidated Annual Report)

BMP	PTS	DESCRIPTION
WATER MANAGEMENT PRACTICES		MINIMIZES THE VOLUME OF OFF-SITE DISCHARGES
½ Inch Water Detention	5	Delay pumping based on rain gage measurements. Detention (in farm canals and soil profile) measured on a per event basis – rainfall vs. runoff
1 Inch Water Detention	10	
Improved Infrastructure	5	Water table management plan; controlling levels in canals and field ditches using internal water control structures, fallow fields, aquatic cover crop fields, prolonged crop flood; effective irrigation and discharge plans
Other	tbd	e.g. Properly constructed and maintained storage system; greater detention with water management plan having target water table levels and structure operating procedures; monitored water table
NUTRIENT CONTROL PRACTICES		MINIMIZES THE MOVEMENT OF NUTRIENTS OFFSITE * Limited Applicability
Nutrient Application Control	2 ½	Uniform and controlled boundary nutrient application (e.g. banding at the root zone; pneumatic controlled-edge application such as AIRMAX); calibrated application equipment; setbacks from canals
Nutrient Spill Prevention	2 ½	Formal spill prevention protocols (handling, transfer, education)
Soil Testing	5	Avoid excess application by determining P requirements of soil.
Plant Tissue Analysis	2 ½	Avoid excess application by determining P requirements of plant
Split P Application*	5	Applying P proportionately at various times during the growing season Total application not exceeding recommendation
Slow Release P Fertilizer*	5	Applying specially treated fertilizer that breaks down slowly thus releasing P to the plant over time
PARTICULATE MATTER AND SEDIMENT CONTROLS		MINIMIZES THE MOVEMENT OF PARTICULATE MATTER AND SEDIMENTS OFF-SITE (Each consistently implemented across the entire basin acreage.)
Any 2	2 ½	<ul style="list-style-type: none"> • leveling fields • ditch bank berm • sediment sumps in canals • canal/ditch cleaning program • slow drainage velocity near pumps • sediment sump upstream of drainage structure • cover crops • raised culvert bottoms • stabilized ditch banks • aquatic plant management • debris barriers at outfall
Any 4	5	
Any 6	10	
PASTURE MANAGEMENT		PLAN FOR ON-FARM OPERATION AND MANAGEMENT PRACTICES
Pasture Management	5	<ul style="list-style-type: none"> • reduce cattle waste nutrients in discharges by "hot spot" management, i.e. plans for placement of drinking water, feed and supplements, cowpens and shade • low cattle density
OTHER BMPS		OTHER PRACTICES PROPOSED
Urban Xeriscape	5	Use of plants that require less water and fertilizer
Detent. Pond Littoral Zone	5	Vegetative filtering area for on-site stormwater runoff
Other BMP Proposed	tbd	BMP proposed by permittee and accepted by SFWMD

Most Effective BMP's...

“One water management practice that proved particularly effective was that of making internal drainage improvements to a farm to allow more uniform drainage. *For example, a farm could be hydraulically subdivided into different blocks with internal water control structures.* This practice makes it less likely that the farm will be over-drained and allows higher P water from areas within the farm to be recirculated internally. This practice works particularly well for farms that employ crop rotation practices. The study indicated that water table response and levels, i.e., drainage on the farm, are more heavily influenced by prevailing water table elevations, rather than open channel gradients from pump operation. Therefore, a combination of improved drainage uniformity over the farm area and a reduction in drainage from a farm through internal redistribution could significantly reduce P concentrations and loads for all crops.”

(2003 Consolidated Annual report, Page 3-23)

**SFWMD BMP DATA FOR WATER YEARS 1995 THROUGH 1997
TEN HIGHEST DISCHARGES IN LBS PER ACRE AND CONCENTRATION**

Basin ID and Ownership		Average Load
		Lbs/Ac
Talisman Sugar Co.	061-18	15.34
Knight Holdings Ltd.	013-01	8.62
U. S. Sugar Corp.	018-19	8.41
S. Florida Grassing, Inc.	026-01	7.83
Talisman Sugar Co.	061-17	4.75
Roth Farms	035-02	4.07
Hand, Homer and Francis	023-01	3.98
Altman, T.A. and Roberta	036-01	3.6
U.S. Sugar Corp.	018-11	3.02
Leon Moss Ranch	071-01	2.66

Basin ID and Ownership		Average Conc.
		PPB
Leon Moss Ranch	071-01	723
Knight Holdings Ltd.	013-01	588.33
Florida Ranch Enterprises	024-01	575.5
Roth Farms	020-01	559.33
S. Florida Grassing Inc.	026-01	539.33
Altman, T.A. and Roberta	036-01	475.33
Roth Farms	035-02	474.33
F & W Farms Inc.	003-01	450.67
Hand, Homer and Francis	023-01	438.33
Sun Dance Farms Inc.	005-04	401

**SFWMD BMP DATA FOR WATER YEARS 1995 THROUGH 1997
TEN LOWEST DISCHARGES IN LBS PER ACRE AND CONCENTRATION**

Basin ID and Ownership		Average load
		Lbs/Ac
Dr. H.E. Hill	053-01	0.17
Sun Dance Farms Inc.	005-02	0.15
F & W Farms, Inc.	003-03	0.12
Shawano Drainage Dist.	060-02	0.12
Okeelanta Corp. E	062-09	0.12
Shawano Drainage Dist.	060-01	0.11
Okeelanta Corp. E	062-01	0.10
Pioneer Ranch & Sugar	022-01	0.08
Okeelanta Corp. E.	062-10	.039
Hub Spooner, Jr.	058-01	0.03

Basin ID and Ownership		Average Conc.
		PPB
Talisman Sugar Co.	061-07	50
Flosun-Sug F Co -op	047-03	49
U.S. Sugar Corp.	018-23	47
U.S. Sugar Corp.	018-21	44.67
Griffin Bros. Co. Inc.	050-01	44
Sugar Farms Co-op	055-02	43.5
Star Ranch Ent. Inc.	019-03	40.67
Miami Sod Co.	051-01	38
Sugar Farms Co-op	055-03	37.5
Okeelanta Corp. E.	062-06	33

**SFWMD BMP DATA FOR 220 EAA BASIN DISCHARGE POINTS WITH TOTAL
AREA OF 502,828 ACRES IN EAA, 1995, 1996, 1997**

**WATER YEAR
1995 AVERAGE**

201.84 PPB

1.57 LBS/ACRE

**WATER YEAR
1996 AVERAGE**

167.51 PPB

0.74 LBS/ACRE

**WATER YEAR
1997 AVERAGE**

146.21 PPB

1.29 LBS/ACRE

**1995, 1996, 1997
3 YEAR AVERAGE**

171.85 PPB

1.20 LBS/ACRE