PART II
EVERGLADES
WATER SUPPLY AND HYDROPERIOD
IMPROVEMENT AND RESTORATION

40E-63.201 — Scope.

(1)   The Everglades Forever Act, in s. 373.4592(4)(b), F.S., (Everglades water supply and hydroperiod improvement and restoration) directs the district generally to correct hydroperiod problems in the Everglades ecosystem by improving water quantity reaching the Everglades, increasing the total quantity of water flowing through the system, reducing wasteful discharges of fresh water to tide, and directing the timing and distribution of water to maximize the natural balance. The Act recognizes that water supply management of the Everglades watershed is complex and subject to legal mandates of both state and federal law.

(2)   To achieve this directive, several interrelated programs and projects are likely to be involved: providing water supply to the Everglades National Park, urban areas, agricultural areas, and Florida Bay; review by the federal government of the Lake Okeechobee regulatory releases; adoption and implementation of minimum flows and levels for the Everglades Protection Area; and implementation of the Lower East Coast Water Supply Plan. Even though interrelated, each program and project is subject to individual technical, legal and administrative requirements. Complete implementation of the hydroperiod improvements could ultimately require data collection, research, analysis, report drafting, plan preparation, rule adoption, operational changes and structural improvements.

(3)   The District has already begun work on several programs and projects related to hydroperiod restoration. Completion dates can be expected to vary according to the complexity of the applicable technical, legal and administrative requirements. Complete implementation may take several years and, even then, be subject to refinement for many years as additional data and analysis become available. The District intends to coordinate the various hydroperiod restoration programs and projects as they evolve over time. Accordingly, the initial implementation activities may be amended or superceded by subsequent implementation activities. In the event the Governing Board initiates operational changes in releases from Lake Okeechobee designed specifically and exclusively to address environmental water needs in the Everglades Protection Area, the replacement water delivery schedule prepared under Subpart A of this Part shall be considered pursuant to Section 40E-63.225(5), F.A.C., or pursuant to Section 120.54(1)(c) and (d), F.S. rule development proceedings to determine whether amendments to Subpart A of this Part are necessary to meet the requirements of Section 373.4592(4)(b), F.S. All changes will be conducted in accordance with the appropriate requirements of the Administrative Procedures Act, Ch. 120, F.S.

(4)   This Part contains rules adopted by the District to implement the water supply and hydroperiod improvement and restoration component of the Everglades Program, either by including them in a Subpart or referencing their location elsewhere in District rules.

Specific Authority 373.044, 373.113, 373.4592 FS. Law Implemented 373.4592(4)(b) FS.
History — New 11-26-95.

Subpart A   BMP Replacement Water

40E-63.211 — Purpose.

This Subpart implements the Everglades Forever Act requirements that the District develop a model to quantify the amount of water to be replaced as a result of reductions of flow to the Everglades Protection Area from BMP implementation and publish a notice of rulemaking on the model no later than July 1, 1995. The timing and distribution of the replaced water is to be directed to maximize the natural balance of the Everglades Protection Area. This Subpart is based on the best information available at the present time. Amendments to incorporate new methodology or to coordinate better with other programs, plans or rules can be expected and shall be made in accordance with Ch. 120, F.S.

Specific Authority 373.044, 373.113, 373.4592 FS. Law Implemented 373.4592(4)(b) FS.History — New 11-26-95.

40E-63.212 — Definitions.

(1)   "Averaging period" means the current water year and the four preceding water years, i.e., the five water years prior to the beginning of a release period on October 1.

(2)   "Base period" means the 10 year period from October 1978 — September 1988.

(3)   "Current water year" means the year beginning October 1 and ending September 30 for which a replacement water allocation is quantified.

(4)   "Release period" means the five months immediately following a current water year during which the replacement water allocation calculated for that year is released. The release period begins on October 1.

Specific Authority 373.044, 373.113, 373.4592 FS.
Law Implemented 373.4592(4)(b) FS.
History — New 11-26-95.

40E-63.223 — Model to Quantify Annual Allocation of Replacement Water.

(1)   This section outlines the model to be used to calculate the volume of water needed to compensate for reductions in runoff from the EAA resulting from implementation of BMPs pursuant to Ch.apter 40E-63, F.A.C. Replacement water volumes refer to flows reaching the Water Conservation Areas or Stormwater Treatment Areas. Replacement water volumes do not include any flows released for urban water supply or agricultural water supply.

(2)   The model is based upon hydrologic data collected during the base period. Procedures for calculating EAA runoff and rainfall are as follows:

(a) Total EAA Runoff is calculated from daily flow measurements obtained from the District's data base. The data base identifiers are listed in the following table:

BMP REPLACEMENT WATER TABLE 1 – RUNOFF							
STRUCTURE	DBKEY	STRUCTURE	DBKEY	STRUCTURE	DBKEY	STRUCTURE	DBKEY
HGS5	15068	S150	15041	G344C	J0721	G402A	LX264
S2	15021	G136	15195	G344D	J0722	G402B	LX265
S3	15018	G200	15736	G349B	JA353	G402C	LX266
S5A5AW	15031	G600	GG955	G350B	JA352	G402D	LX267
S6	15034	EBPS	LX274	G344A	J0719	G404	LX269
S7	15037	ESPS	LX273	G344B	J0720	G410	LX270
S8	15040			G328	J0718	G357	LX263

1. The EAA Runoff equation is:

Runoff = - Minimum (0, S3 + ~~G88~~ + G136 +G344A + G344B + G344C + G344D + G402A + G402B + G402C + G402D - S8 - G200 – G349B – G350B – G357 – G404 – G410 – G600)
- Minimum (0, S2 - S6 - S7 - S150 – G328 + ESPS)
- Minimum (0, HGS5 - S5A5AW ~~G250~~ + 0.82 EBPS)

2. The volume of EAA Runoff discharged to the South (Water Conservation Areas) is calculated from daily flow measurements using the following equation:

Runoff to South = Runoff + Minimum (0, S3) + Minimum (0, S2) + Minimum (0, HGS5)

3. The data used in the above equations will be adjusted by the District to account for any new inflows or outflows from the EAA developed in the future in order to ensure that replacement water volume is not affected by future reductions in the EAA contributing watershed area, including those changes caused by the construction of Stormwater Treatment Areas.

(b) EAA Rainfall is calculated from measurements obtained from the District's data base. It is calculated as the weighted sum of daily rainfall measurements at 9 rainfall monitoring stations. The data base identifiers for rainfall stations and station weights are listed on the following table:

BMP REPLACEMENT WATER TABLE 2 – RAINFALL STATIONS			
DBKEY	**THEISSEN WEIGHT**	**DBKEY**	**THEISSEN WEIGHT**
15197	0.0974	15202	0.0989
15198	0.1076	15203	0.0763
15199	0.0844	15204	0.0592
15200	0.1617	15205	0.1743
15201	0.1438		

(3) The ~~model calculates~~ methodology to calculate the annual replacement water volume is based upon:

(a) volume of runoff from the EAA under base-period conditions, adjusted for variations in ~~annual~~ monthly rainfall;

(b) observed runoff reduction for the averaging period;

(c) percentage of EAA runoff which was discharged to the Water Conservation Areas during the averaging period;

(d) future reductions in EAA contributing watershed area, including those due to construction of Stormwater Treatment Areas.

(1) The ~~equations~~ method for calculating the annual replacement water volume (1000 acre-ft) ~~are~~ is based on a two step process:

Step 1.   A statistical test is used to determine if the monthly rainfall/runoff relationship observed during the Averaging Period is statistically similar to the monthly rainfall runoff relationship observed during the Base Period. If the statistical test demonstrates similarity in the runoff response to rainfall at a 90% confidence level between the Base Period and the Averaging Period, no Replacement Water deliveries will be made.

    The test is conducted utilizing the 120 months of data from the Base Period and the 60 months of data from the Averaging period. An F-Test is then performed to determine whether the regression coefficients for the two time periods are significantly different.

Step 2.   If the test in Step 1 fails to demonstrate similarity, then the Replacement Volume will be computed as the greater of zero (0.0) and the Replacement Volume as computed based on the following:

Replacement Volume	=	~~Predicted Runoff ×~~ Runoff Reduction × Area Factor × Fraction South
~~Predicted Runoff~~	=	~~Total Runoff for Current Water Year Predicted from Base Period Rainfall / Runoff Regression (1000 acre-ft)~~
	=	~~-1585.6 + 53.87 × Rainfall~~
Runoff reduction	=	Sum of the twelve monthly values calculated by taking the difference between the runoff predicted for each month of the Current Water Year using the Base Period Equation, and the runoff predicted for the same months using the Averaging Period Equation. (1000 acre-ft)
Base Period Equation	=	$1.2091*Rainfall^2+13,764*Rainfall+2.6$
Avg. Period Equation	=	This equation is calculated each year by computing the second order regression between the monthly rainfall and monthly runoff for the five years of data collected during the Averaging Period.
Rainfall	=	Total EAA Rainfall for each month of the Current Water Year (inches)
Area Factor	=	Factor to Account for Change in Watershed Contributing Area
	=	Average Area in Current Water Year/Average Area in Base Period
Average Area for Base Period	=	523,791 acres (Everglades Protection Project, Conceptual Design, February 15, 1994)
~~Runoff Reduction~~	=	~~Measured Runoff Reduction for Averaging Period~~
	~~=~~	~~1 - Σ (Observed EAA Runoff) / Σ (Predicted Runoff × Area Factor)~~
~~Σ~~	~~=~~	~~Sum over Averaging Period~~
Fraction South	=	Fraction of Total Runoff Discharged to South During Averaging Period
	=	Σ (EAA Runoff to South) / Σ (EAA Total Runoff)
Σ	=	Sum over Averaging Period

(5)   If measurements required to calculate the annual replacement water volume are not available due to delays in data processing, recorder malfunction, etc., values will be estimated based upon best available methods. Measurements of rainfall and runoff volume required for the above computations shall be available within 75 days of data collection.

Specific Authority 373.044, 373.113, 373.4592 FS. Law Implemented 373.4592(4)(b) FS.
History — New 11-26-95.

40E-63.225 — Delivery of Average Annual Allocation of Replacement Water.

(1)   The average annual allocation will be delivered each year in accordance with s. 373.4592(4)(b), F.S.

(2)   Under typical hydrological conditions, the average annual allocation will be delivered during the replacement period according to the following fixed percentages, which are designed to produce future flows (runoff + makeup) characteristic of the seasonal distribution of flows from the EAA under more natural conditions: October 28.7%; November 22.8%; December 26.5%; January 14.9%; February 7.1%.

(3)   Replacement water deliveries will be made to the Water Conservation Areas before the Stormwater Treatment Areas (STAs) are operational. Replacement water deliveries will be made to the STAs after they are operational, except when the delivery is likely to cause hydraulic bypass around an STA or otherwise hinder its performance.

(4)   Replacement water deliveries will not be made when delivery is infeasible due to conveyance constraints south of Lake Okeechobee, when individual Water Conservation Areas (or their upstream Stormwater Treatment Areas) exceed regulation schedule, or during a Level 1 Alert.

(5)   Under extreme hydrological conditions, the replacement water delivery schedule shall be submitted to the Governing Board for consideration under Section 373.4592(4)(b), F.S. Extreme conditions include those under which:

(a)   the replacement water allocation is likely to be discharged as a regulatory release from the Water Conservation Areas to tidewater or to cause detrimental flows to Everglades National Park; or

(b)   the water level in Lake Okeechobee is at a warning stage or lower as defined in the Lake Okeechobee Water Supply Management Plan.

(6)   Differences between the allocated and delivered volumes will not be carried forward from one month to the next.

(7)   Replacement water will be delivered on a monthly basis before any other flows are released to the Water Conservation Areas or Stormwater Treatment Areas for environmental purposes.

Specific Authority 373.044, 373.113, 373.4592 FS. Law Implemented 373.4592(4)(b) FS.
History — New 11-26-95.