Appendix 5-2: Calculation Methodology for Estimating Flow and Total Phosphorus Loads and for Determining Effective Treatment Areas for the Everglades STAs

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EFFECTIVE TREATMENT AREA ESTIMATES

The effective treatment area equates to acreage within the flow path and which contains the treatment vegetation, while total area of the project site includes canals, levees, control structures, and all other areas that are not directly removing total phosphorus (TP). Effective treatment area is based upon the stage-area relationship derived from topography data and is the wetted area corresponding to the target stage. Target stage is estimated as the average ground elevation in a cell plus the target depth. Typically, the total area is about 15 percent larger than the effective treatment area.

The Water Year 2010 (WY2010) (May 1, 2009–April 30, 2010) effective treatment areas for each Everglades Stormwater Treatment Area (STA) were estimated based on (1) whether the STA or STA cell was able to discharge water, (2) an assessment of the health and stability of the vegetation within each treatment cell, and (3) review of recorded flow measurements. An STA or STA cell can typically discharge water once net improvement water quality (start-up) tests are completed; however, an STA may be considered offline until inflows and/or outflows have occurred (i.e., if operational constraints exist or if it is recovering from or undergoing vegetation reestablishment following construction or rehabilitation efforts).

Prior to WY2008, the acreage of a treatment cell was included in the effective treatment area estimates if the cell was able to receive inflow, regardless of whether there was outflow. After WY2008, the treatment cell was considered to be online when the cell was able to receive inflow and when the cell had discharges considered to be proportional to the expected amounts.

WATER YEAR 2010 TIME-WEIGHTED EFFECTIVE TREATMENT AREA ESTIMATES

STA-1E

- Effective treatment area = 5,132 acres (ac) included Eastern Flow-way (Cell 1 and Cell 2), Central Flow-way (Cell 3, Cell 4N, and Cell 4S), and Western Flow-way (Cell 5, Cell 7, and Cell 6).
- The Central Flow-way was operational for all of WY2010; the Eastern Flow-way was offline from April 25, 2009–January 24, 2010, for repair of the S-365A and S-365B water control structures, then brought online with restrictions due to operation of the U.S. Army Corps of Engineers' (USACE) Periphyton-Based Stormwater Treatment Area (PSTA) Demonstration Project in Cell 2 for the rest of the water year; the Western Flow-way was online until October 12, 2009, then offline through June 14, 2010, for rehabilitation activities.
- Adjusted effective treatment area calculation for WY2010 = (2,038 ac x 165 days + 1,986 ac x 365 days + 1,108 ac x 96 days)/365 days = 3,199 acres.

STA-1W

- Effective treatment area = 6,670 acres included Northern Flow-way (Cell 5A and Cell 5B), Eastern Flow-way (Cell 1A, Cell 1B, and Cell 3) and Western Flow-way (Cell 2A, Cell 2B, and Cell 4).
- Entire STA was considered effective treatment area during WY2010.

STA-2

- Effective treatment area = 8,240 acres includes Cells 1, 2, 3, and 4.
- Entire STA was considered effective treatment area during WY2010.

STA-3/4

- Effective treatment area = 16,543 acres (Eastern Flow-way (Cells 1A and 1B), Central Flow-way (Cells 2A and 2B), and Western Flow-way (Cells 3A and 3B).
- Entire STA was considered effective treatment area during WY2010.

STA-5

- Effective treatment area = 6,095 acres includes Northern Flow-way (Cell 1A and Cell 1B), Central Flow-way (Cell 2A and Cell 2B), and Southern Flow-way (Cell 3A and Cell 3B).
- The Central Flow-way was operational for all of WY2010. The Northern Flow-way was online with restrictions following rehabilitation from June 10, 2009–October 27, 2009, and then taken offline until February 10, 2010, for vegetation establishment; subsequently, it was brought back online for the remainder of the water year. The Southern Flow-way was online from June 12, 2009–November 5, 2009, and then taken offline through the end of the water year due to Compartment C Build-out activities (excavation of the inflow supply canal and construction of G-342G and G-342H).
- Adjusted effective treatment area calculation for WY2010 = (2,055 ac x 219 days + 2,055 ac x 365 days + 1,985 ac x 146 days) = 4,082 acres.

STA-6

- Effective treatment area = 2,257 acres includes Cell 3, Cell 5, and Section 2.
- Entire STA was considered effective treatment area during WY2010.

OPERATIONAL ENVELOPE

The limits for the average and maximum STA operational envelope values are from the EFA permit exhibits, Technical Support Documents, Operational Envelopes appendices for each STA (2007). The annual values used for the water year comparison are from the April 365-day cumulative inflow volumes and inflow loads adjusted by the adjusted effective treatment area.

CALCULATION OF STA FLOWS AND TOTAL PHOSPHORUS LOADS

The TP loads in surface water inflow and outflow were calculated for each STA using a web-based JAVA application, the application accesses DBHYDRO, the District's water quality and hydrologic database. Flow that moves in the opposite direction than intended is termed negative or reverse flow. Both positive and negative flows at water control structures were used in these calculations. The STA flow volumes were based on surface water daily average flow and the TP loads were calculated using flow or time-proportional auto-sampler data. If auto-sampler data was not available, then TP data from grab samples collected during flow events were used instead. The combination of stations that were used to estimate the overall STA inflow and outflow volumes and TP loads are listed in **Table 1** along with the specific station names used to query the database. Inflow hydraulic and phosphorus loading rates were calculated using the adjusted effective treatment areas.

STA-1E Inflow Load Calculations

Stormwater Treatment Area 1 East (STA-1E) inflows are calculated using flows measured through structures S-319, G-311, and S-361. S-361 flows are composed of STA-1E seepage recirculation and runoff from 640 acres suburban and 430 acres agricultural area (Rustic Ranch). The runoff component is considered as inflow into STA1-E. The runoff component of S-361 pump station is computed at the end of the water year using the period of record flows. At end of each water year, the runoff proportion (percentage) is recomputed based on the average of the daily flows for the period of record (to end of the water year) then multiplied by 365.25 to get the annual average inflow. Then, the average annual design seepage of 4,931 acre-feet (ac-ft) is subtracted out of the annual average inflow to get the average annual runoff. The runoff percentage is computed from the ratio of the annual average runoff and the annual average flow. The water year runoff is the newly computed runoff percentage of the current water year total inflow from S-361. Water can leave STA-1E before it enters into the treatment cells via reverse flow through G-311. These reverse flows are subtracted out of the inflow calculations and load estimates are calculated using grab samples collected during flow events at S-319.

PERIOD OF RECORD FLOW AND TP LOAD ESTIMATES

The period of record (POR) estimates from the start of operation through WY2009 for STA inflow and outflow flow volumes and TP loadings were recalculated in WY2010. The recalculation of the historical data was done in order to account for data changes that occur as modifications are made to the flow or water quality estimates as well as to ensure that a uniform methodology is used when calculating the historical loading estimates. **Table 1** lists the flow records and matching water quality data that are used to estimate the STA inflow and outflow loadings. Because the STAs became operational at different times, the data periods vary for each STA.

As a result of the recalculations, there were only relatively small changes to the flows and loads for STA-1E, STA-2, STA-5, and STA-6 that were reported in the *2010 South Florida Environmental Report* (SFER) – *Volume I,* Chapter 5 (**Tables 2A/2B** through **7A/7B**, respectively). STA-6 outflow flow-weighted mean (FWM) TP concentrations only changed by 1 part per billion (ppb). The POR data compared to what was reported in the 2010 SFER changed mainly for STA-1E and STA-2 inflows and STA-6 outflows. The POR changes for STA-1E reflect the modification of G-311 preferred flows and only using water quality from S319, when S319 is flowing and when water is leaving STA-1E through G-311at the same time to calculate loads leaving STA-1E via G-311. STA-1E flow data is expected to change annually with the percent calculation of S361 inflow volumes using the methodology presented above. For STA-2, inflows were decreased in WY2001 and WY2002 because flows from the S-6 pump station should not have been included prior to June 2001 because S-6 was not an inflow point until after a plug was installed directing flows from S-6 to STA-2. The changes that occurred to the STA-5 loads reflected the use of some flagged data in the calculations in the 2010 SFER. At STA-6, the structures were resurveyed which affected the flow estimates for the STA-6 structures.

Table 1. Water quality and flow stations used to calculate total phosphorus (TP) load for each Stormwater Treatment Area (STA). Station names are from DBHYDRO, the South Florida Water Management District's hydrological and water quality database.

STA-1E

Inflow Calculation = S319_P + G311_S + S361_P*

(* Flows used in monthly DMR contain both seepage and runoff)

In WY2010, 52.08 percent of the total amount of S361 was used.

Outflow = S362

Flow Station	***DB Keys (Preferred, Source)***	***WQ Station***	***Mode***
S319_P	TP366, SD029	S319	2
S361_P*	TP368, WN254, T0904	S361	2
G311_S (when positive)	TP367, TA933	G311	2
G311_S (when negative)	TP367, TA933	Grab samples at S-319 when S-319 flowing	0
S362_P	TP369, T0897	S362	2

STA-1W

Inflow = G250 from 8/1994 – 6/1999; G-302 from 7/1999 to present

Outflow = G310 and G251

Flow Station	***DB Keys (Preferred, Source)***	***WQ Station***	***Mode***
G250_P	16222, 15847	ENR002	2
G302_P	JW221, JJ806	G302	2
G310_P	M2901, PK919	G310	2
G251_P	JW222, 15848	G251	2

STA-2

Inflow Calculation = S6_P (after 6/2001) + G328_P – G328I_P – G328I_C – G338_C – G339_S

Outflow = G335

Flow Station	***DB Keys (Preferred, Source)***	***WQ Station***	***Mode***
S6_P	15034, 06741	S6	2
G328_P	J0718, MQ903	G328	2
G328I_P	TA605	G328R	2
G328I_C	TA607	G328R	2
G338_C (when positive)	MC705	Grab samples at S6	5
G338_C (when negative)	MC705	Grab sample at S10D	5
G339_S (when positive)	MC706	Grab samples at S6	5
G339_S (when negative)	MC706	Grab sample at G335	5
G335_P	N0659, LG726	G335	2

Table 1. Continued.

STA-3/4

Inflow Calculation:

G370_P + (G372_P – G372HL)

Outflows = G376A-C_T, G376D-F_T, G379A-C_T, G379D-E_T, G381A-B_T, and G381C-F_T

Flow Station	***DB Keys (Preferred, Source)***	***WQ Station***	***Mode***
G370_P	TA438, T0973	G370	2
G372_P	TA437, T0975	G372	2
G372HL	TS285	G372	2
G376A-C_T	TA445	G376B	2
G376D-F_T	TA446	G376E	2
G379A-C_T	TA449	G379B	2
G379D-E_T	TA450	G379D	2
G381A-B_T	TA447	G381B	2
G381C-F_T	TA448	G381E	2

STA-5

Inflow = G342A_C, G342B_C, G342C_C, G342D_C, G342E_C, and G342F_C

Outflow = G344A_C, G344B_C, G344C_C, G344D_C, G344E_C, and G344F_C

Flow Station	***DB Keys (Preferred, Source)***	***WQ Station***	***Mode***
G342A_C	J6406, JJ111	G342A	2
G342B_C	J6398, JJ116	G342B	2
G342C_C	J6407, LS293	G342C	2
G342D_C	J6405, JJ126	G342D	2
G342E_C	WH024, VV399	G342E	2
G342F_C	WH025, VV406	G342F	2
G344A_C	J0719, JJ117	G344A	2
G344B_C	J0720, JJ118	G344B	2
G344C_C	J0721, JJ119	G344C	2
G344D_C	J0722, JJ120	G344D	2
G344E_C	WH026, VW787	G344E	2
G344F_C	WH027, VW788	G344F	2

Table 1. Continued.

STA-6			
Inflow = G600 from 12/1997 through 9/2007; G396, G353AB, and G353C_C from 10/2007 to present*			
Outflow = G606 from 12/1997 through 2/2001; G393_C, G354_C, and G352 from 3/2001 to present			
Flow Station	***DB Keys (Preferred, Source)***	***WQ Station***	***Mode***
G600_P	GG955, TA881, T0890	G600	2
G396	WN361, None	G396B	2
G353AB	WN363, None	G353B	2
G353C_C	WN384, VV552	G353C	2
G606 (STA6out)	HD889	G606	2
G352	WN362, None	G352B	2
G393_C	MC959, J5569	G393B	2
G354_C	MC958, J0939	G354C	2

***** In WY2008, inflow volume measured at G601 (J5566), G602 (J5567), and G603 (J5568); WQ was measured at G353B.

Notes:

MODE (Used in Nutrient Load program)

0 = Use grab sample results only on days with flow - extrapolate between missing values.

2 = Use autosampler results first, if missing use grab sample results only on days with flow – extrapolate between missing values.

5 = Use grab sample results only, use sample results if flow or no flow exists to extrapolate between missing values.

Table 2. Difference between *2010 South Florida Environmental Report* (SFER) – *Volume I*, Chapter 5, reporting and Water Year 2010 (WY2010) (May 1, 2009–April 30, 2010) estimates for Stormwater Treatment Area 1 East (STA-1E) inflows and outflows.

STA-1E

Difference

Historical data presented in 2010 SFER compared to data updated in 2011 SFER

	Inflow ac-ft	Inflow TP kg	Inflow TP ppb	Outflow ac-ft	Outflow TP kg	Outflow TP ppb
Hurricane response, start Sep. 2004–April 2005	2,054	222	-14	0	(0)	(0)
2006	4,462	160	-14	0	0	(0)
2007	4,324	28	-10	-	(0)	(0)
2008	6,962	-530	-9	-	0	(0)
2009	-300	-3	0	(534)	(10)	0

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 3. Inflow and outflow estimates for STA-1E as reported in the 2010 SFER – Volume I, Chapter 5, compared to recalculations made in WY2010.

STA-1E

Updated data							Previously presented in SFER 2010						
Water Year	Inflow Volume (ac-ft)	Inflow Load (kg)	Inflow FWM TP (ppb)	Outflow Volume (ac-ft)	Outflow Load (kg)	Outflow FWM TP (ppb)	Water Year	Inflow (ac-ft)	Inflow TP (kg)	Inflow TP (ppb)	Outflow (ac-ft)	Outflow TP (kg)	Outflow TP (ppb)
2005	17,372	4,631	216	17,565	8,071	373	Hurricane response, start Sep. 2004 - Apr. 2005	19,426	4,853	202	17,565	8,071	373
2006	45,754	10,524	186	40,572	7,295	146	2006	50,216	10,684	172	40,572	7,295	146
2007	100,522	29,451	238	97,818	8,622	71	2007	104,846	29,479	228	97,818	8,622	71
2008	131,793	18,204	112	125,391	3,138	20	2008	138,755	17,674	103	125,391	3,138	20
2009	145,493	32,615	182	149,066	3,884	21	2009	145,192	32,612	182	148,532	3,874	21

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 4. Difference between 2010 SFER – Volume I, Chapter 5, reporting and WY2010 estimates for Stormwater Treatment Area 1 West (STA-1W) inflows and outflows.

STA-1W

Difference

Historical data presented in 2010 SFER compared to data updated in 2011 SFER

	Inflow ac-ft	Inflow TP kg	Inflow TP ppb	Outflow ac-ft	Outflow TP kg	Outflow TP ppb
1995, partial WY, start August 1994	-1	0	0	0	0	(0)
1996	0	0	0	0	(0)	(0)
1997	0	0	0	0	(0)	(0)
1998	0	0	0	0	(0)	(0)
1999	0	0	0	0	(0)	(0)
2000	1	0	0	0	(0)	(0)
2001	703	58	-1	0	0	(0)
2002	0	0	0	0	0	(0)
2003	0	0	0	0	(0)	(0)
2004	0	-173	0	0	0	(0)
2005	0	0	0	0	(0)	(0)
2006	0	0	0	0	0	(0)
2007	0	0	0	-	(0)	(0)
2008	0	0	0	-	(0)	(0)
2009	0	0	0	-	(0)	(0)

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 5. Inflow and outflow estimates for STA-1W as reported in the 2010 SFER – Volume I, Chapter 5, compared to recalculations made in WY2010.

STA-1W

Updated data							Previously presented in SFER 2010						
Water Year	Inflow Volume (ac-ft)	Inflow Load (kg)	Inflow FWM TP (ppb)	Outflow Volume (ac-ft)	Outflow Load (kg)	Outflow FWM TP (ppb)	Water Year	Inflow (ac-ft)	Inflow TP (kg)	Inflow TP (ppb)	Outflow (ac-ft)	Outflow TP (kg)	Outflow TP (ppb)
1995	92,364	15,453	136	95,333	2,718	23	1995, partial WY, start Aug. 1994	92,364	15,452	136	95,333	2,718	23
1996	182,670	24,464	109	172,414	5,079	24	1996	182,670	24,464	109	172,414	5,079	24
1997	118,780	14,391	98	119,198	2,750	19	1997	118,780	14,391	98	119,198	2,750	19
1998	80,304	11,536	116	80,986	2,125	21	1998	80,304	11,536	116	80,986	2,125	21
1999	88,532	11,096	102	86,376	2,045	19	1999	88,532	11,096	102	86,376	2,045	19
2000	125,862	22,477	145	121,229	3,753	25	2000	125,863	22,477	145	121,229	3,753	25
2001	93,819	17,113	148	90,517	4,319	39	2001	94,522	17,171	147	90,517	4,319	39
2002	278,857	51,767	151	267,624	12,200	37	2002	278,857	51,767	150	267,624	12,200	37
2003	591,845	112,172	154	595,999	39,234	53	2003	591,845	112,172	154	595,999	39,234	53
2004	292,690	50,907	141	297,603	17,073	47	2004	292,690	50,733	141	297,603	17,073	47
2005	341,094	103,872	247	383,365	46,489	98	2005	341,094	103,872	247	383,365	46,489	98
2006	142,678	37,415	213	137,890	19,265	113	2006	142,678	37,415	213	137,890	19,265	113
2007	121,698	41,511	277	126,246	18,493	119	2007	121,698	41,511	277	126,246	18,493	119
2008	116,291	26,574	185	117,002	7,611	53	2008	116,291	26,574	185	117,002	7,611	53
2009	164,425	49,917	246	187,208	8,208	36	2009	164,425	49,917	246	187,208	8,208	36

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 6. Difference between 2010 SFER – Volume I, Chapter 5, reporting and WY2010 estimates for Stormwater Treatment Area 2 (STA-2) inflows and outflows.

STA-2

Difference

Historical data presented in 2010 SFER compared to data updated in 2011 SFER

	Inflow ac-ft	Inflow TP kg	Inflow TP ppb	Outflow ac-ft	Outflow TP kg	Outflow TP ppb
2001 partial WY, flow records start July 2000	140,739	21,760	87	-	-	
2002	-570	-11	0	0	(0)	(0)
2003	3,026	380	0	0	0	(0)
2004	62	6	0	0	0	(0)
2005	322	16	0	0	(0)	(0)
2006	2,096	86	-1	0	0	(0)
2007	848	63	0	-	(0)	(0)
2008	436	14	0	-	0	(0)
2009	246	10	0	-	-	(0)

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 7. Inflow and outflow estimates for STA-2 as reported in the 2010 SFER – Volume I, Chapter 5, compared to recalculations made in WY2010.

STA-2

Updated data							Previously presented in SFER 2010						
Water Year	Inflow Volume (ac-ft)	Inflow Load (kg)	Inflow FWM TP (ppb)	Outflow Volume (ac-ft)	Outflow Load (kg)	Outflow FWM TP (ppb)	Water Year	Inflow (ac-ft)	Inflow TP (kg)	Inflow TP (ppb)	Outflow (ac-ft)	Outflow TP (kg)	Outflow TP (ppb)
2001	17,273	595	28	-	-		2001 partial WY, flow records start Jul. 2000	158,012	22,355	115	0	0	
2002	213,378	19,667	75	240,685	4,871	16	2002	212,808	19,656	75	240,685	4,871	16
2003	279,706	21,384	62	308,297	6,757	18	2003	282,731	21,765	62	308,297	6,757	18
2004	256,876	24,324	77	284,780	5,036	14	2004	256,938	24,330	77	284,780	5,036	14
2005	315,951	49,033	126	371,023	9,228	20	2005	316,273	49,048	126	371,023	9,228	20
2006	291,618	43,609	121	322,303	8,238	21	2006	293,714	43,695	121	322,303	8,238	21
2007	220,969	44,358	163	217,572	11,008	41	2007	221,817	44,421	162	217,572	11,008	41
2008	203,945	26,821	107	227,003	6,089	22	2008	204,381	26,835	106	227,003	6,089	22
2009	250,136	37,594	122	291,408	6,503	18	2009	250,382	37,604	122	291,408	6,503	18

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 8. Difference between 2010 SFER – Volume I, Chapter 5, reporting and WY2010 estimates for Stormwater Treatment Area 3/4 (STA-3/4) inflows and outflows.

STA-3/4

Difference

Historical data presented in 2010 SFER compared to data updated in 2011 SFER

	Inflow ac-ft	Inflow TP kg	Inflow TP ppb	Outflow ac-ft	Outflow TP kg	Outflow TP ppb
2004 partial WY, start October 2003	0	0	0	0	0	(0)
2005	0	0	0	0	(0)	(0)
2006	0	0	0	0	0	(0)
2007	0	0	0	0	1	0
2008	0	0	0	0	(0)	(0)
2009	0	0	0	0	(0)	(0)

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 9. Inflow and outflow estimates for STA-3/4 as reported in the 2010 SFER – Volume I, Chapter 5, compared to recalculations made in WY2010.

STA-3/4

Updated data							Previously presented in SFER 2010						
Water Year	Inflow Volume (ac-ft)	Inflow Load (kg)	Inflow FWM TP (ppb)	Outflow Volume (ac-ft)	Outflow Load (kg)	Outflow FWM TP (ppb)	Water Year	Inflow (ac-ft)	Inflow TP (kg)	Inflow TP (ppb)	Outflow (ac-ft)	Outflow TP (kg)	Outflow TP (ppb)
2004	23,303	1,392	48	25,811	481	15	2004 partial WY, start Oct. 2003	23,303	1,392	48	25,811	481	15
2005	671,442	87,368	105	646,587	10,375	13	2005	671,442	87,368	105	646,587	10,375	13
2006	696,729	105,310	123	736,422	21,241	23	2006	696,729	105,310	123	736,422	21,241	23
2007	388,471	69,921	146	355,423	9,809	22	2007	388,471	69,921	146	355,423	9,810	22
2008	295,080	48,104	132	296,162	7,355	20	2008	295,080	48,104	132	296,162	7,355	20
2009	445,610	52,515	96	459,427	7,357	13	2009	445,610	52,515	96	459,427	7,357	13

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 10. Difference between 2010 SFER – Volume I, Chapter 5, reporting and WY2010 estimates for Stormwater Treatment Area 5 (STA-5) inflows and outflows.

STA-5

Difference

Historical data presented in 2010 SFER compared to data updated in 2011 SFER

	Inflow ac-ft	Inflow TP kg	Inflow TP ppb	Outflow ac-ft	Outflow TP kg	Outflow TP ppb
2000 partial WY, start Sep. 1999	296	48	-4	1,502	365	4
2001	348	94	0	2	0	(0)
2002	587	153	0	4,824	223	(2)
2003	27	10	0	0	0	(0)
2004	95	229	1	0	0	(0)
2005	245	51	0	0	0	(0)
2006	1,893	734	1	224	67	0
2007	0	0	0	-	(1)	(0)
2008	-2	-1	0	2	1	0
2009	50	34	0	0	(0)	(0)

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 11. Inflow and outflow estimates for STA-5 as reported in the 2010 SFER – Volume I, Chapter 5, compared to recalculations made in WY2010.

STA-5

Updated data							Previously presented in SFER 2010						
Water Year	Inflow Volume (ac-ft)	Inflow Load (kg)	Inflow FWM TP (ppb)	Outflow Volume (ac-ft)	Outflow Load (kg)	Outflow FWM TP (ppb)	Water Year	Inflow (ac-ft)	Inflow TP (kg)	Inflow TP (ppb)	Outflow (ac-ft)	Outflow TP (kg)	Outflow TP (ppb)
2000	7,792	2,212	230	11,840	2,376	163	2000 partial WY, start Sep. 1999	8,088	2,260	226	13,343	2,741	167
2001	50,111	15,575	252	39,976	4,898	99	2001	50,459	15,669	252	39,978	4,898	99
2002	158,672	48,918	250	126,180	12,872	83	2002	159,258	49,071	250	131,005	13,095	81
2003	170,176	57,198	272	160,518	26,456	134	2003	170,203	57,207	272	160,518	26,456	134
2004	152,984	47,849	254	136,466	16,407	97	2004	153,080	48,078	255	136,466	16,407	97
2005	119,665	24,406	165	121,427	12,220	82	2005	119,910	24,457	165	121,427	12,220	82
2006	214,621	52,293	198	200,872	23,643	95	2006	216,514	53,027	199	201,096	23,710	96
2007	58,690	21,682	299	54,163	12,858	192	2007	58,690	21,682	299	54,163	12,857	192
2008	13,921	1,970	115	7,073	835	96	2008	13,919	1,968	115	7,075	836	96
2009	99,235	31,122	254	106,216	7,315	56	2009	99,285	31,155	254	106,217	7,315	56

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 12. Difference between 2010 SFER – Volume I, Chapter 5, reporting and WY2010 estimates for Stormwater Treatment Area 6 (STA-6) inflows and outflows.

STA-6

Difference

Historical data presented in 2010 SFER compared to data updated in 2011 SFER

	Inflow ac-ft	Inflow TP kg	Inflow TP ppb	Outflow ac-ft	Outflow TP kg	Outflow TP ppb
1998 partial WY, flow-through Dec. 1997	2,837	161	-1	1,447	40	0
1999	0	0	0	0	(54)	(2)
2000	0	0	0	0	28	0
2001	0	0	0	611	(180)	(6)
2002	0	0	0	8,124	177	0
2003	0	0	0	9,489	312	0
2004	0	0	0	9,633	145	0
2005	0	0	0	5,906	134	(0)
2006	0	0	0	1,489	(34)	(3)
2007	0	0	0	5,231	286	(0)
2008	853	100	0	783	43	3
2009	0	-102	-1	1,285	162	0

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion

Table 13. Inflow and outflow estimates for STA-6 as reported in the 2010 SFER – Volume I, Chapter 5, compared to recalculations made in WY2010.

STA-6

Updated data							Previously presented in SFER 2010						
Water Year	Inflow Volume (ac-ft)	Inflow Load (kg)	Inflow FWM TP (ppb)	Outflow Volume (ac-ft)	Outflow Load (kg)	Outflow FWM TP (ppb)	Water Year	Inflow (ac-ft)	Inflow TP (kg)	Inflow TP (ppb)	Outflow (ac-ft)	Outflow TP (kg)	Outflow TP (ppb)
							1998 partial WY, startup Oct. 1997	4,121	190	37			
1998	23,264	1,470	51	22,537	441	16	1998 partial WY, flow-through Dec. 1997	26,101	1,631	51	23,984	481	16
1999	40,120	3,052	62	24,035	642	22	1999	40,120	3,052	62	24,035	588	20
2000	59,848	5,353	73	59,261	1,087	15	2000	59,848	5,353	73	59,261	1,115	15
2001	39,395	6,821	140	26,107	1,166	36	2001	39,395	6,821	140	26,718	986	30
2002	53,437	4,506	68	22,342	438	16	2002	53,437	4,506	68	30,466	615	16
2003	56,252	5,474	79	26,126	828	26	2003	56,252	5,474	79	35,615	1,139	26
2004	52,674	3,424	53	29,049	416	12	2004	52,674	3,424	53	38,682	561	12
2005	34,035	3,255	78	16,282	381	19	2005	34,035	3,255	78	22,187	515	19
2006	40,467	5,183	104	23,246	726	25	2006	40,467	5,183	104	24,735	692	23
2007	32,443	4,360	109	11,525	633	45	2007	32,443	4,360	109	16,755	920	45
2008	5,823	672	94	1,675	74	36	2008	6,676	772	94	2,458	117	38
2009	57,265	14,077	199	42,323	4,874	93	2009	57,265	13,975	198	43,608	5,036	94

TP – total phosphorus; ac-ft – acre-feet; kg – kilograms; ppb – parts per billion