Everglades Agricultural Area Regional Feasibility Study

Deliverable 3.2 - Optimum Allocation of Loads to the STAs for the Period 2010-2014

Alternative No. 1 (Final Report)

(Contract No. CN040912-WO04 Phase 2)

Prepared for:

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October 2005

October 3, 2005

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South Florida Water Management District
EAA Regional Feasibility Study
ADA Contract No. CN040912-WO04 Phase 2
Optimum Allocation of Loads to the STAs, 2010-2014
Alternative No. 1
B&McD Project No. 38318

Dear Mr. Vazquez:

Burns & McDonnell is pleased to submit this Final report on "Optimum Allocation of Loads to the STAs for the Period 2010-2014, Alternative No. 1". This document is intended for attachment to ADA's overall report on Task 3, and was prepared under ADA Engineering, Inc. Task Order No. BM-05WO04-02 dated April 27, 2005.

We gratefully acknowledge the valuable contributions of both your staff and that of the South Florida Water Management District in the development of the information presented herein.

Certification

I hereby certify, as a professional engineer in the State of Florida, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse without specific verification or adaptation by the Engineer. This certification is provided in accordance with the provisions of the Laws and Rules of the Florida Board of Professional Engineers under Chapter 61G15-29, Florida Administrative Code.

Galen E. Miller, P.E., Florida P.E. #40624

Date:________________

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1. INTRODUCTION

This document and the analyses it summarizes were prepared by Burns & McDonnell Engineering Co., Inc. under contract to ADA Engineering, Inc (ADA). The conduct of these analyses and preparation of this document were authorized by the South Florida Water Management District (SFWMD or District) through its March 27, 2005 issuance of Work Order No. CN040912-WO04 to ADA, and subsequently authorized by ADA through its April 27, 2005 issuance of Task Order BM-05WO04-02 to Burns & McDonnell.

1.1. Background

Under the Everglades Construction Project (ECP), the South Florida Water Management District has constructed several STAs and the U.S. Army Corps of Engineers has constructed STA-1E to help improve the quality of waters released to the Everglades Protection Area (EPA). In addition to the existing STAs, the District is planning certain STA expansions and enhancements, Everglades Agricultural Area (EAA) canal improvements, construction of the EAA Storage Reservoir Project, and other EAA improvements. With recognition of these planned improvements, the EAA Regional Feasibility Study (RFS) will evaluate alternatives for redistributing inflow volumes and phosphorus loads to the various STAs to optimize phosphorus removal performance. This study is not intended to define the final arrangement, location or character of these proposed projects but is a fact-finding exercise to develop the information necessary for the subsequent planning, design and construction of these future projects.

1.2. Scope of Work

This document was prepared in support of Task 3 "Optimum Allocation of Phosphorus and Hydraulic Loading to the Existing STAs and A-1 Reservoir, and Optimum Canal Improvements Associated with Optimum Allocation" and Task 4 "Detailed Alternative Analysis" of the SFWMD Work Order No. CN040912-WO04. The overall objective of the analyses reported herein is to evaluate the redistribution of hydraulic and total phosphorus loads to the STAs (both existing and the currently planned STA-6, Section 2, full conversion of Compartments B and C of the Talisman Land Exchange to use in stormwater treatment areas) to optimize phosphorus reduction, given the presence of the Everglades Agricultural Area Storage Reservoir (EAASR) Compartment A-1. This analysis is specific to the period

2010-2014 (following completion of the above identified projects, but prior to the completion of the planned EAASR Compartment A-2), and addresses Alternative No. 1 (described more fully in Part 2 of this document).

Estimates of the overall inflow volumes and TP loads to be accommodated in the various STAs were developed under Task 1 of Contract CN040912-WO04. Basins considered include the following:

- C-51 West Canal
- S-5A (West Palm Beach Canal)
- Ch. 298 Districts:
  - East Beach Water Control District
  - East Shore Water Control District
  - 715 Farms (State Lease No. 3420)
  - South Shore Drainage District
  - South Florida Conservancy District, Unit 5 (S-236 Basin)
- S2/S-6/S-7 (Hillsboro and North New River Canals)
- S-3/S-8 (Miami Canal)
- C-139 and C-139 Annex
- L-8 Canal
- Lake Okeechobee deliveries south to the STAs and Everglades

1.3. Analytical Methods for Estimating TP Reduction in STAs

The estimated performance of the various STAs in reducing total phosphorus concentrations presented in this document were developed employing the July 1, 2005 issue of the Dynamic Model for Stormwater Treatment Areas, Version 2 (DMSTA2), developed for the U.S. Department of the Interior and the U.S. Army Corps of Engineers by W. Walker and R. Kadlec. Additional information on DMSTA2 can be found on the Internet at:

www.wwalker.net/dmsta

1.4. Reference Information

This section summarizes previous studies, reports and data employed in the conduct of the analyses presented herein.

1.4.1. Inflow Volumes, TP Concentrations and TP Loads

Inflow volumes, TP concentrations and TP loads employed in this analysis are based on information presented in the following reports, all prepared for the South Florida Water Management District by Burns & McDonnell Engineering Co., Inc. under subcontract to ADA Engineering, Inc. as elements of Task 1 of the scope of work under District Contract CN040912-WO04:

- Deliverable 1.1.2: *Evaluation of 2006 Hydrologic Simulation Results*, Final Report dated June 27, 2005;

- Deliverable 1.2A: *Inflow Data Sets for the Period 2010-2014,* Final Report dated September 29, 2005;

- Deliverable 1.3.2: *Historic Inflow Volumes and Total Phosphorus Concentrations by Source,* Final Report dated June 27, 2005;

- Deliverable 1.4.2: *Methodology for Development of Daily Total Phosphorus Concentrations,* Final Report dated June 30, 2005;

- Deliverable 1.5.2: *Inflow Data Sets for the Period 2006-2009,* Final Report dated August 9, 2005;

1.4.2. Basic Designs of Proposed STA Expansions

Information on the presently planned configuration and basic layout and design of STA-6, Section 2; Cell 4 of STA-2; and the third flow-way of STA-5 was taken from the following documents:

- *Basis of Design Report (BODR) Stormwater Treatment Area 6 – Section 2 and Modifications to Section 1*; prepared for the South Florida Water Management District by URS Corporation under Contract CN040936-WO02; June 1, 2005;

- *Basis of Design Report (BODR) STA-2/Cell 4 Expansion Project*; prepared for the South Florida Water Management District by Brown & Caldwell under Contract CN040935-WO04; May 12, 2005;

- Draft Basis of Design Report (BODR) Stormwater Treatment Area 5 Flow-way 3; prepared for the South Florida Water Management District by URS Corporation under Contract CN040936-WO05; April 20, 2005.

No information is presently available for the planned configuration and basic layout and design of the full conversion of Compartments B and C of the Talisman Land Exchange to use as stormwater treatment areas. The layout and configuration of those expanded stormwater treatment areas <u>assumed</u> for use in this analysis is described in Part 6, Compartment B and Part 9, STA-5 of this document.

The layout, configuration and operation of the EAASR Compartment A-1 <u>assumed</u> for use in this analysis is based on review of the data contained in the District's South Florida Water Management Model (SFWMM) ECP 2010 simulation, as generally described in Deliverable 1.2A.

1.4.3. Rainfall and Evapotranspiration

Estimates of daily rainfall and evapotranspiration (ET) at each of the STAs was taken from a District-furnished data file (ET_RF_STAs_ECP2006.xls). That file includes daily values for both rainfall and ET at each cell of the SFWMM occupied by STA. The data extends from January 1, 1965 through December 31, 2000. For this analysis, daily data for those STAs occupying multiple cells of the SFWMM was estimated as the average of the individual cell values. Data for STA-3/4 was applied to the adjacent EAASR Compartment A-1.

1.4.4. Previous Studies and Reports

Certain of the background data and information discussed in this document was taken from the following previous studies and reports:

- (Draft) *Supplemental Analysis, Everglades Protection Area Tributary Basins*, prepared for the Everglades Agricultural Area Environmental Protection District by Burns & McDonnell; March 2, 2005 (hereinafter referred to as the Supplemental Analysis);

- Final Report, *Everglades Protection Area Tributary Basins, Long-Term Plan for Achieving Water Quality Goals*; prepared for the South Florida Water Management District by Burns & McDonnell; October, 2003 (hereinafter referred to as the Long-Term Plan), together with such modifications to the Long-Term Plan that are embodied in a revised Part 2 (dated November, 2004) submitted to the Florida Department of Environmental Protection (FDEP), and approved by FDEP in December, 2004;

- *Basin-Specific Feasibility Studies, Everglades Protection Area Tributary Basins; Evaluation of Alternatives for the ECP Basins*; prepared for the South Florida Water Management District by Burns & McDonnell; October 23, 2002 (hereinafter referred to as the BSFS Evaluation of Alternatives).

- *Addendum to Design Documentation Report, Stormwater Treatment Area 1 East*; prepared for the Jacksonville District, U.S. Army Corps of Engineers by Burns & McDonnell; November 2000;

- *(Draft) Stormwater Treatment Area 1-East (STA-1E) Water Control Plan*, Jacksonville District, U.S. Army Corps of Engineers; August, 2005;

- *(Draft) Design Analysis Report for the STA*-1E Cells 1-2 PSTA/SAV Field-Scale Demonstration Project, Palm Beach County, Florida; prepared for the Jacksonville District, U.S. Army Corps of Engineers by SAIC Engineering, Inc.; June 28, 2005.

Additionally, reference is made to the following document prepared by Burns & McDonnell for ADA Engineering Co., Inc. under Task 2 of the SFWMD Contract No. CN040912-WO04:

- Deliverable 2.2: *Optimum Allocation of Loads to the STAs for the Period 2006-2009*, Final Report dated September 7, 2005.

1.4.5. DMSTA2 Parameters for Existing STAs

Basic physical parameters for the various existing STAs reflected in the DMSTA2 analyses reported herein were taken from the BSFS Evaluation of Alternatives, with the following modifications:

- Marsh outflow coefficients (exponent and intercept) were modified to 4 and 1, respectively, consistent with basic guidance contained in the DMSTA2 documentation. They had previously been estimated on the basis of results taken from two-dimensional hydrodynamic analyses in certain of the STAs. It was concluded on the basis of trial runs that this change did not influence projected outflow concentrations, and modified peak and mean depths in the STAs changed by less than 5 centimeters.

- Seepage estimates were updated to reflect the results of water balance analyses prepared by the District for operating STAs. In addition, cell-to-cell seepage (at STA-1W and STA-1E) considered in the BSFS Evaluation of Alternatives was eliminated from this analysis due to its minor influence on the results and to improve the clarity of the estimates.

The most significant modification to DMSTA parameters, as compared to those considered in the BSFS Evaluation of Alternatives, was the use of updated calibration data sets for the performance of various vegetation types in reducing total phosphorus concentrations. Four basic vegetation calibrations were considered in this analysis:

- EMG_3: An updated calibration of the performance of emergent macrophyte vegetation, using data from full-scale STAs (replaced EMG in the 4/01/2002 version of DMSTA used in the BSFS Evaluation of Alternatives).

- SAV_3: An updated calibration of the performance of submerged aquatic vegetation, using data from full-scale STAs (replaced SAV_C4 and NEWS in the 4/01/2002 version of DMSTA used in the BSFS Evaluation of Alternatives).

- PEW_3 (Pre-Existing Wetland): A new calibration data set developed to reflect the performance of those cells in the operating STAs (and in other wetland data sets, such as WCA-2A) in which the wetland vegetation existed naturally. As applied to the existing STAs, the application of this data set is limited to Cells 1 and 2 of STA-2; STA-6 Section 1; and Cell 1B of STA-3/4.

- RES_3 (Reservoir): A new calibration data set developed to reflect the performance of reservoirs in reducing total phosphorus loads. As applied to this analysis, the use of RES_3 is limited to the EAASR Compartment A-1.

Water quality improvement projections on which the Long-Term Plan was based were predicated on an ability to reproduce the performance of the best two years of operation of Cell 4 in STA-1W (SAV_C4) in those cells containing Submerged Aquatic Vegetation. A range in performance of those cells was also considered, employing the NEWS (Non-Emergent Wetland Systems) calibration data sets.

Comparison of summary data presented in Tables 2.4 and 2.6 of Deliverable 1.4.2 indicates that, for no other change in input data, the substitution of SAV_3 in DMSTA2 for SAV_C4 in the April 2002 version of DMSTA results in roughly a 20% increase in the projected flow-weighted mean TP concentration in outflows from STA-1W, following its enhancement as recommended in the Long-Term Plan, and roughly a 30% increase in the estimated geometric mean TP concentration in those outflows. However, the projected flow-weighted and geometric mean concentrations using the SAV_3 data set in DMSTA2 fall below those estimated using the NEWS calibration data set in the April 2002 version of DMSTA.

The net effect of this change in calibration data sets is to, as compared to projections considered in development of the Long-Term Plan and with all other inputs unchanged, result in higher projected outflow concentrations than the mean estimates considered in the Long-Term Plan, but still within the probable range of performance reported in the Long-Term Plan.

2. DESCRIPTION OF ALTERNATIVE NO. 1

As concluded in Deliverable 2.2, the overall performance of the various stormwater treatment areas is expected to be generally balanced over the period 2006-2009; no significant benefit would be expected to result from attempts to significantly redistribute inflow volumes and TP loads during that period However, projected outflow concentrations from the STAs during the period 2006-2009 fall above long-term water quality goals.

Upon the full build-out of Compartments B and C of the Talisman Land Exchange, and completion of the EAASR Compartment A-1, substantial additional acreage of water management and treatment area will be added in the south central and western parts of the EAA, suggesting that overall system performance during the period 2010-2014 would benefit from a redistribution of projected inflow volumes and TP loads. Alternative No. 1 is structured to redistribute inflow volumes and TP loads in order to take advantage of and more fully utilize those additional water management areas. Principal components of Alternative No.1 are summarized below and indicated graphically in Figure 2.1.

1. New control structure in the West Palm Beach (WPB) Canal to permit a partial diversion of runoff from roughly the northern half of the S-5A drainage basin and the East Beach Water Control District.
2. New Canal from WPB Canal to the Sam Senter Canal
3. Expanded Sam Senter Canal
4. Expanded capacity of the Ocean Canal from the Sam Senter Canal to the Hillsboro Canal
5. Expanded capacity of the Hillsboro Canal from the Ocean to the Cross Canal
6. New control structure in the Hillsboro Canal south of the Cross Canal to permit a partial diversion of runoff from the S-2/S-6 Basin (as well as runoff from the East Shore Water Control District/715 Farms, and additional inflows diverted from the S-5A Basin) to the Cross Canal and then to the North New River.

7. Expanded capacity of the Cross Canal and enlarged farm bridges along the Cross Canal
8. Expanded capacity of North New River Canal (NNRC) south of the Cross Canal
9. A-1 Reservoir and Compartment B, each with new inflow pumping stations on the NNRC.
10. STA-2 Cell 4 is hydraulically severed from Cells 1, 2, and 3, and is redirected to use in the new Compartment B STA.
11. STA-5, expanded to include the entire Compartment C of the Talisman Land Exchange (including that portion initially converted to use as STA-6 Section 2), is initially assumed to receive runoff from only the C-139 Basin.
12. STA-6 is initially assumed to receive runoff only from the C-139 Annex.
13. S-5AW will be closed, and the capacity of S-5AE will be increased as necessary to eliminate the discharge of L-8 Basin runoff to the STA-1 Inflow & Distribution Works.

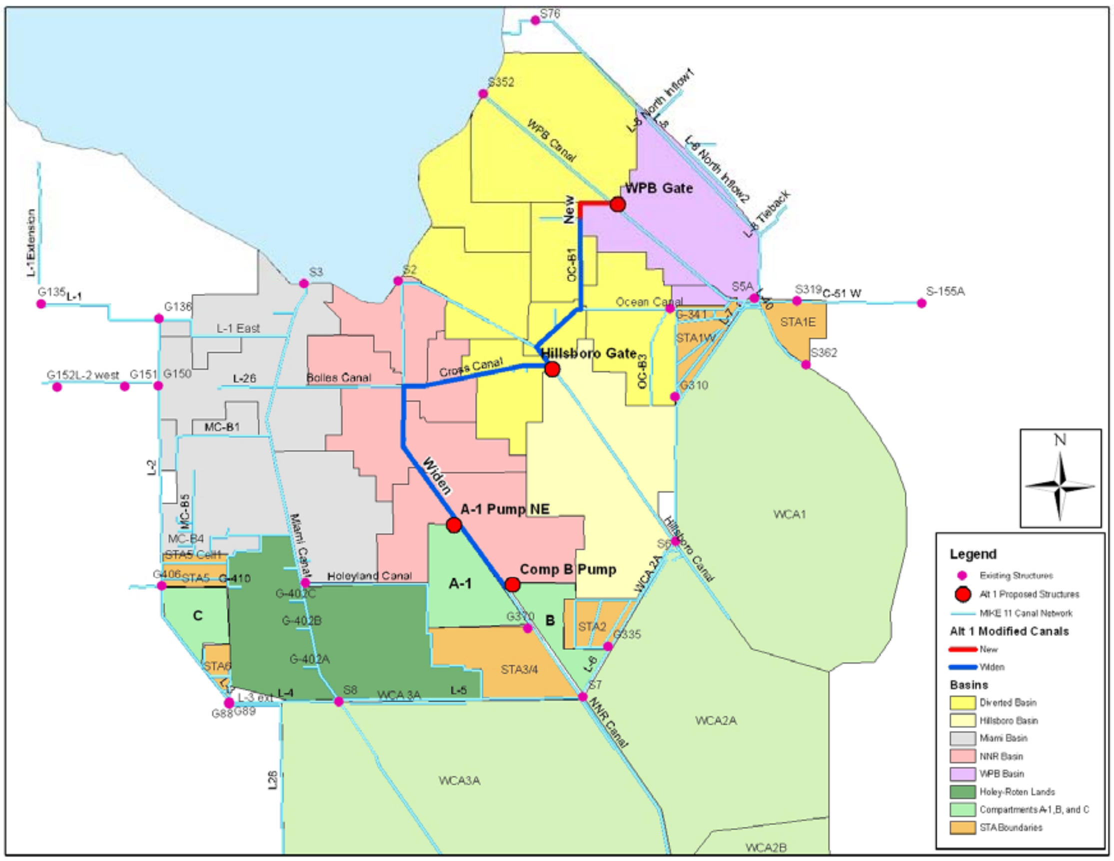

Figure 2.1 General Schematic of Alternative No. 1

3. STA-1W

For this analysis, the enhancements to STA-1W recommended in the Long-Term Plan are assumed to be complete. This analysis considers the full area of the various flow paths as being effective for treatment, resulting in a total effective treatment area of 6,670 acres. In the BSFS Evaluation of Alternatives, the effective area of Cells 3 and 4 had been reduced by 326 and 108 acres, respectively.

All inflows to STA-1W enter through Structure G-302, a gated spillway situated in Levee L-7. That structure discharges from the STA-1 Inflow and Distribution Works. Inflows to the STA-1 Inflow and Distribution Works historically include pumped discharges from Pump Station S-5A and gravity inflows from the L-8 Borrow Canal through Structure S-5AS. In addition to G-302, discharges from the STA-1 Inflow and Distribution Works can be made through G-300 and G-301 (to the L-40 and L-7 borrow canals, respectively, in the Loxahatchee National Wildlife Refuge, or LNWR) and G-311 (to the West Distribution Cell of STA-1E).

The nominal capacity of S-5A is 4,800 cfs; of G-301 is 3,250 cfs; and of G-311 is 1,550 cfs.

In development of the South Florida Water Management Model (SFWMM) 2010 ECP simulation on which the estimated inflow volumes and TP loads is based, certain significant changes in overall system management from historic operations were assumed. Those assumptions include the following that directly and materially influence the projected performance of STA-1W in reducing total phosphorus loads and concentrations:

- Cessation of Lake Okeechobee regulatory releases at Structure S-352;
- Elimination of inflows to the STA-1 Inflow and Distribution Works from the L-8 Borrow Canal, including both L-8 Basin runoff and Lake Okeechobee releases to the L-8 Borrow Canal at Culvert C-10A;
- Water supply releases to the West Palm Beach Canal at S-352 destined for the Lower East Coast and delivered through the LNWR would only be made when the stage in the LNWR is at or below the floor of its regulation schedule.

Implementation of each of the above assumptions in the Operations Plan for STA-1W and related elements of the system is critical to the water quality improvement performance projections presented herein.

For the period 2010-2014, inflows to the STA-1 Inflow and Distribution Works are assumed to be limited to runoff from the S-5A Basin in the Everglades Agricultural Area (EAA), runoff from the East Beach Water Control District (EBWCD) diverted to the West Palm Beach Canal, and water supply releases from Lake Okeechobee; those water supply releases are assumed to simply pass through the STA-1 Inflow and Distribution Works, and not require treatment.

A summary of the total estimated average annual inflows to the STA-1 Inflow and Distribution Works, prior to the partial diversion associated with Alternative No. 1, is presented in Table 3.1.

Table 3.1 Potential Total Inflows to STA-1 I&D Works

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
S-5A Basin	232,318	44,104	154	Deliverable 1.2A, Table 3.14
EBWCD	15,212	9,386	500	Deliverable 1.2A, Table 2.3
Lake Okeechobee	14,184	2,227	127	Deliverable 1.2A, Table 6.8
Total Inflow	261,714	55,717	173	
Assumed Bypass	14,184	2,227	127	Water Supply to LEC and L-8
Inflow to be Treated	**247,530**	**53,490**	**175**	

Of the total water supply bypass volume, an average annual volume of 2,282 acre-feet per year (Term "WLC352" as reported in the ECP 2010 simulation) is considered discharged to the LNWR, with the balance delivered to the L-8 borrow canal. The average annual TP load discharged to the LNWR in the water supply bypass is estimated to be 0.36 metric tons. It should also be noted that the S-5A Basin runoff listed in Table 3.1 excludes that part of the basin runoff considered previously diverted to STA-2 through the S-5A Basin Diversion Works.

3.1. Determination of Firm Diversion Capacity

A series of analyses were prepared in which the estimated firm rate of diversion from the West Palm Beach Canal to the Sam Senter Canal and S-2/S-6 Basin was varied until such time as the mean estimate of the long-term geometric mean TP concentration in outflows from STA-1W reached 10 ppb. All inflows to the STA-1 Inflow & Distribution Works following the diversion were assumed to be directed to STA-1W; the reasonableness of that assumption is further discussed below.

The total area of the S-5A Basin tributary to Pumping Station S-5A for the period 2009-2014 is approximately 92,700 acres (reduced from the current tributary area by 900 acres to reflect the presence of the L-8 Basin Reservoir, one feature of the North Palm Beach County component of the Comprehensive Everglades Restoration Plan, or CERP). For this analysis, it was assumed that, on any given day, simulated runoff from the S-5A Basin was evenly distributed throughout the basin, with the result that roughly 50% of the simulated daily runoff was considered tributary to the West Palm Beach Canal at the point of diversion (new control structure in the West Palm Beach Canal approximately 10 miles southeast of Structure S-352 at Lake Okeechobee). Discharges from the EBWCD enter the West Palm Beach Canal roughly 4 miles southeast of S-352, and are included in the total flows tributary to the new control structure.

The simulated daily flows at the new control structure were then reduced by the assigned firm rate of diversion, with all diverted flows directed to the Sam Senter Canal. Remaining flows were then added to the simulated daily runoff from the S-5A Central Sub-Basin, and that summation of flows was included in the inflow time series to STA-1W. Table 3.2 presents a summary of the influence of the assigned firm rate of diversion from the West Palm Beach Canal on the performance of STA-1W. In development of the data reflected in Table 3.2, the long-term geometric mean was based on the geometric mean of 7-day composite samples over the 35-year period of analysis, and vary slightly from the final estimates presented in Table 3.3, which were based on the geometric mean of 30-day composite samples over the 35-year period of analysis.

Table 3.2 Sensitivity of STA-1W Performance to Firm Rate of Diversion

Firm Diversion Rate (cfs)	Estimated Average Annual Inflow to STA-1W, WY 1966-2000			
	Volume (1,000 ac-ft)	TP Load (metric tons)	FWM TP Conc. (ppb)	Geo. Mean TP Conc. (ppb)
0	247.7	53.32	174.5	N/A
600	149.2	30.03	163.3	N/A
800	131.4	25.84	159.5	N/A
1,000	125.3	24.38	157.7	N/A
Firm Diversion Rate (cfs)	Estimated Average Annual STA-1W Outflow, WY 1966-2000			
	Volume (1,000 ac-ft)	TP Load (metric tons)	FWM TP Conc. (ppb)*	Geo. Mean TP Conc. (ppb)*
0	248.6	9.13	29.8	21.6
600	151.3	3.83	20.5	10.7
800	133.8	3.11	18.9	9.0
1,000	127.7	2.76	17.5	8.5
Firm Diversion Rate (cfs)	Estimated Average Annual Diversion, WY 1966-2000			
	Volume (1,000 ac-ft)	TP Load (metric tons)	FWM TP Conc. (ppb)	Geo. Mean TP Conc. (ppb)
0	0.0	0.00	---	N/A
600	98.5	23.29	192	N/A
800	116.3	27.48	192	N/A
1,000	122.4	28.94	192	N/A

* Outflow concentrations based on mean estimates of performance

It was concluded as a result of this sensitivity analysis that a firm diversion rate of approximately 800 cfs at the new control structure in the West Palm Beach Canal is required to achieve a projected long-term geometric mean of 10 ppb in outflows from STA-1W; that rate of diversion was carried forward in the analysis.

3.1.1. Hydraulic Capacity of STA-1W

The hydraulic design capacity of both STA-1W and Structure G-302 (which controls releases from the STA-1 Inflow & Distribution Works to STA-1W) is 3,250 cfs, 1,550 cfs less than the Pumping Station S-5A capacity of 4,800 cfs. Under current operations (prior to full operation of STA-1E), inflows at S-5A exceeding the design capacity of G-302 are bypassed to the Loxahatchee National Wildlife Refuge (LNWR). Once STA-1E is placed in full operation, inflows exceeding the design capacity of G-302 can be delivered to STA-1E through Structure G-311, in lieu of being bypassed to the LNWR. Analyses summarized in Deliverable 2.2 consider possible variations in the operation of

Structures G-302 and G-311 on the projected performance of STA-1W and STA-1E over the period 2006-2009.

The 4,800-cfs capacity of S-5A was established to provide a removal rate of ¾” per day from a tributary area in the Everglades Agricultural Area originally reported as 240 square miles (153,600 acres). As reported in Deliverable 1.1.2, the total area of the S-5A Basin (including that part of the basin now diverted following completion of Structure G-341) is now 120,240 acres. Following diversion of the 26,400-acre area of the basin tributary to the Ocean Canal west of G-341, the area of the S-5A Basin now tributary to Pumping Station S-5A is estimated to be 93,840 acres. For the period 2010-2014, that area is further reduced by 870 acres to reflect the anticipated area of the L-8 Basin Reservoir during that period, yielding a total S-5A Basin area tributary to Pump Station S-5A of approximately 93,000 acres. At a removal rate of ¾” per day (equal to the original design rate of removal for all primary District pumping stations in the EAA), the required capacity at S-5A for a tributary area of 93,000 acres would be 2,930 cfs.

Completion of the EBWCD diversion (one element of the original 1994 Everglades Construction Project, or ECP) adds an additional 6,542 acres to the total area tributary to S-5A.

Upon the assumption that operations at S-5A are limited to four of the six pumps (leading to a capacity reduction from 4,800 cfs to 3,200 cfs, or essentially equal to the hydraulic capacity of G-302 and STA-1W), the available net removal from the entire area tributary to S-5A (including the EBWCD) would be 0.77 inches per day. With the addition of the 800-cfs firm capacity for diversion to the Sam Senter Canal, the available net removal rate from the entire area tributary to S-5A would be 0.96” per day.

It would therefore appear feasible to limit the operations at S-5A to use of four of the six pumps without negatively impacting the design level of flood protection in the S-5A Basin, permitting all discharges from S-5A to pass through G-302 and STA-1W.

3.2. DMSTA2 Analysis of STA-1W

Table 3.3 presents a summary of the results of the DMSTA2 analyses for STA-1W as it is influenced by Alternative No. 1; the analysis includes Water Years 1966-2000. Summary DMSTA2 input and output data for this case (**2010 Alt1**) are included in Appendix A.

Table 3.3 Summary of DMSTA2 Analysis, STA-1W Alternative No. 1

Parameter	Units	Summary of Results
		2010 Alt1
Average Annual Inflow		
Volume	1,000 ac-ft	131.4
TP Load	metric tons	25.84
FWM TP Concentration	ppb	160
Average Annual Outflow		
Volume	1,000 ac-ft	133.8
FWM TP Concentration		
Upper Confidence Limit	ppb	16.6
Mean Estimate	ppb	18.9
Lower Confidence Limit	ppb	21.9
Geometric Mean TP Conc.		
Upper Confidence Limit	ppb	7.9
Mean Estimate	ppb	10.2
Lower Confidence Limit	ppb	13.4
TP Load (Using Mean FWM Conc.)	metric tons	3.11
For Detailed Results, See Appendix A		Table A.1
Summary of Bypasses and Diversions		
Water Supply to LEC and L-8		
Volume	1,000 ac-ft	14.2
TP Load	metric tons	2.23
FWM TP Concentration	ppb	127
Divert to Ocean Canal through Sam Senter Canal		
Volume	1,000 ac-ft	116.3
TP Load	metric tons	27.48
FWM TP Concentration	ppb	192

4. STA-1E

For this analysis, STA-1E is assumed to be in full operation, and the enhancements to STA-1E recommended in the Long-Term Plan are assumed to be complete. This analysis considers the West and East Distribution Cells of STA-1 as integral elements of the treatment works, modeled as emergent vegetation with poor hydraulics (0.5 CSTRs in series).

Inflows to STA-1E enter through Structure G-311, a gated spillway situated in Levee L-40; Pumping Station S-319 on the C-51 West Canal; and Pumping Station S-361, which discharges to the upper end of Cell 4S of STA-1E. Structure G-311 discharges from the STA-1 Inflow and Distribution Works; inflows to STA-1E from that source are considered to be controlled by operations at G-302 and STA-1W. Pumping Station S-361 is projected to discharge an average of 2.5% of the total C-51 West Basin runoff; for this analysis, those discharges are assumed included in the total inflows to the C-51 West Canal.

In development of the South Florida Water Management Model (SFWMM) 2010 ECP simulation on which the estimated inflow volumes and TP loads are based, certain significant changes in overall system management from historic operations were assumed. Those assumptions include the following that directly and materially influence the projected performance of STA-1E in reducing total phosphorus loads and concentrations:

- Cessation of Lake Okeechobee regulatory releases to the L-8 Borrow Canal at Culvert C-10A (in particular those eventually discharged through Structure S-5AE);

- Elimination of inflows to the STA-1 Inflow and Distribution Works from the L-8 Borrow Canal, including both L-8 Basin runoff and Lake Okeechobee releases to the L-8 Borrow Canal at Culvert C-10A;

- Elimination of regulatory releases from the LNWR through Structures S-5AS and S-5AE.

Implementation of each of the above assumptions in the Operations Plan for STA-1E and related elements of the system is critical to the water quality improvement performance projections presented herein.

In addition to the above assumptions, the operation of structures in and along the C-51 West Canal is assumed developed to send a volume through S-155A (bypassing STA-1E) equal to inflows to the C-51 West Canal from the L-8 Basin at S-5AE. For this analysis, those bypass volumes were assigned as equal to same-day inflows at S-5AE. The total phosphorus concentration in those bypasses was assigned equal to the flow-weighted mean concentration in all inflows to the C-51 West Canal on that same date. The net effect of this assumption is to bypass a larger total phosphorus load through S-155A than is delivered from the L-8 Basin through S-5AE.

For the period 2010-2014, inflows to the C-51 West Canal under this Alternative No. 1 are considered limited to:

- Runoff from the C-51 West Basin;
- Runoff from Basin B of the Acme Improvement District, which is assumed to be diverted from its present points of discharge (to the LNWR) to the C-51 West Canal;
- Runoff from the L-8 Basin through Structure S-5AE (volumes assumed bypassed through S-155A as discussed above).

To the extent that water supply deliveries may be made through the C-51 West Canal, those water supply releases are assumed to simply pass through to S-155A and not require treatment. A summary of the estimated average annual inflows to the C-51 West Canal is presented in Table 4.1.

Table 4.1 Estimated Inflows to C-51 West Canal

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
C-51 West Basin	136,812	23,307	138	Deliverable 1.2A, Table 5.6
Acme Basin B	34,887	4,850	113	Deliverable 1.2A, Table 5.8
L-8 Basin	36,256	3,548	79	Deliverable 1.2A, Table 5.2
Total Inflow	207,955	31,705	124	
Assumed Bypass	36,256	4,691	105	L-8 Runoff Through S-155A
Inflow to be Treated	**171,699**	**27,014**	**128**	

Under this Alternative No. 1, no normal discharges from the STA-1 Inflow and Distribution Works through Structure G-311 to STA-1E are considered.

4.1. Cases Considered in DMSTA2 Analysis of STA-1E

A total of two potential inflow cases were considered in the DMSTA-2 analysis of STA-1E. The two cases considered are described as follows:

- **2010 All:** All inflows to the C-51 West Canal (including inflows from the L-8 Basin) were assigned to STA-1E. All inflows to the STA-1 Inflow and Distribution Works were assigned to STA-1W. Analysis of this case was included to confirm the need for bypass of inflows from the L-8 Basin.

- **2010 Base:** For this case, inflows to STA-1E from the C-51 West Canal at S-319 and at S-362 were assumed to be consistent with the summary data presented in Table 4.1 (e.g., bypass of inflow volumes from the L-8 Basin).

4.2. Summary of DMSTA2 Results

Table 4.2 presents a summary of the results of the DMSTA2 analyses for STA-1E. Summary DMSTA2 input and output data for each case are included in Appendix A.

Table 4.2 Summary of DMSTA2 Analyses, STA-1E, WY 1966-2000

Parameter	Units	Summary of Results by Case	
		2010 All	2010 Base
Average Annual Inflow			
Volume	1,000 ac-ft	208.1	171.8
TP Load	metric tons	31.73	27.03
FWM TP Concentration	ppb	124	128
Average Annual Outflow			
Volume	1,000 ac-ft	204.6	168.5
FWM TP Concentration			
Upper Confidence Limit	ppb	14.8	10.1*
Mean Estimate	ppb	19.2	13.3*
Lower Confidence Limit	ppb	24.8	17.9
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	9.6	7.6
Mean Estimate	ppb	13.4	10.6
Lower Confidence Limit	ppb	18.5	15.0
TP Load (Using Mean FWM Conc.)	metric tons	4.85	2.77
For Detailed Results, See Appendix A		Table A.2	Table A.3
Summary of Bypasses and Diversions			
Bypass Through S-155A			
Volume	1,000 ac-ft	0.0	36.3
TP Load	metric tons	0.00	4.69
FWM TP Concentration	ppb	---	105

* Projected flow-weighted mean TP concentration in outflows less than calibration range lower limit of 15 ppb

4.3. Treated Discharges to Loxahatchee National Wildlife Refuge (LNWR)

Table 4.3 summarizes total estimated discharges to the Loxahatchee National Wildlife Refuge (LNWR) from STA-1W and STA-1E under Alternative No. 1. That tabulation excludes water supply bypasses to the Lower East Coast and the LNWR.

Table 4.3 Total Estimated Treated Discharges to LNWR

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
STA-1W Case 2006 Alt1, STA-1E Case 2010 Base				
STA-1W	133.8	3.11	18.9	Table 3.3
STA-1E	168.5	2.77	13.3*	Table 4.2
Total Inflow	302.2	5.88	15.8	

* Projected flow-weighted mean TP concentration in outflows less than calibration range lower limit of 15 ppb

In addition, for each of the two cases considered, there would also be untreated discharges from the STA-1 Inflow and Distribution Works for Lower East Coast water supply when stages in the LNWR are at or below the floor of the LNWR regulation schedule (see Table 3.1 and the text immediately following that table).

5. STA-2

For this analysis, STA-2 (including the addition of Cell 4) is considered to be in full operation. However, the enhancements to the existing STA-2 (before Cell 4 expansion) recommended in the Long-Term Plan are considered as not in place, as the District has indicated (through its December 2004 amendment of the Long-Term Plan) its intent not to immediately proceed with the subdivision of existing flow paths. In addition, Cells 1 and 2 of STA-2 are analyzed using DMSTA2 calibration data sets for pre-existing vegetation (PEW_3), as no efforts are presently underway to convert those cells (which are at present performing well) to SAV.

Under Alternative No. 1, Cell 4 of STA-2 is considered to be hydraulically severed from STA-2, instead becoming one cell of the new stormwater treatment area on Compartment B (see Part 6 of this document).

At present, inflows to STA-2 include discharges from Pumping Station S-6 and Pumping Station G-328 (an agricultural pumping station situated on the STA-2 Supply Canal intermediate to S-6 and STA-2). Currently, inflows are considered limited to:

1. Basin runoff from the S-2/S-6 Basin;

2. Basin runoff from the East Shore Water Control District/715 Farms Chapter 298 districts (ESWCD/715) diverted from Lake Okeechobee;

3. Basin runoff from the S-5A Basin diverted to the Hillsboro Canal through the S-5A Basin Diversion Works.

In addition, analyses summarized in the Supplemental Analysis suggest that a substantial volume of water is introduced to STA-2 as seepage from the L-6 Borrow Canal and WCA-2A, ascribed primarily to the length of the STA-2 Supply Canal between S-6 and STA-2. That induced seepage inflow is assigned at a uniform rate of 38 cfs (27,500 acre-feet per year) and an assigned flow-weighted mean TP concentration of 15 ppb.

In development of the SFWMM 2010 ECP simulation on which the estimated inflow volumes and TP loads are based, certain significant changes in overall system management from historic operations were assumed. Those assumptions include the following that directly and materially influence the projected performance of STA-2 in reducing total phosphorus loads and concentrations:

- Cessation of Lake Okeechobee regulatory releases to the Hillsboro Canal and STA-2 at Structure S-351;

- Water supply releases to the Hillsboro Canal at S-351 destined for the Lower East Coast Service Area 2 (term "WL2351" in the 2010 ECP simulation) would only be made when the stage in WCA-2A is at or below the floor of its regulation schedule, and would bypass STA-2.

Implementation of the first of the above assumptions in the Operations Plan for STA-2 and related elements of the system is critical to the water quality improvement performance projections presented herein. The second assumption addresses relatively minor volumes and TP loads as simulated.

Under Alternative No. 1, inflows to the Hillsboro Canal would be increased as a result of the partial diversion of the S-5A Basin through the Sam Senter and Ocean canals, increasing the potential inflows to STA-2. A summary of the estimated average annual inflows to the Hillsboro Canal under Alternative No. 1 is presented in Table 5.1.

Table 5.1 Average Annual Inflows to Hillsboro Canal

Source	Potential Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
S-2/S-6 Basin	236,624	28,327	97	Deliverable 1.2A, Table 3.3
ESWCD/715	29,818	4,588	125	Deliverable 1.2A, Table 2.6
Current S-5A Diversion	58,778	11,152	154	Deliverable 1.2A, Table 3.15
Add'l.l S-5A Diversion	116,300	27,480	192	See Table 3.3; firm 800 cfs diversion from West Palm Beach Canal
Seepage from WCA-2A	27,500	509	15	See text
Lake Okeechobee	832	86	84	Water Supply to LEC SA2 (WL2351)
Total Inflow	469,852	72,142	124	
Assumed Bypass	832	86	84	Water Supply to LEC SA2 (WL2351)
Inflow to be Treated	**469,020**	**72,056**	**125**	

Under Alternative No. 1, a new control structure would be placed in the Hillsboro Canal immediately downstream (southeast) of its confluence with the Cross Canal, essentially dividing the existing S-2/S-6 Basin into two sub-basins. The S-2/S-6 South Sub-basin would include those areas tributary to the Hillsboro Canal south of the new control structure, and would encompass approximately 62,300 acres (52%) of the 119,900-acre S-2/S-6 Basin. The remaining 48% of the S-2/S-6 Basin, together with all other sources of inflow identified in Table 5.1, would be tributary to the Hillsboro Canal immediately upstream of the new control structure.

5.1. Cases Considered in DMSTA2 Analysis of STA-2

A total of two potential cases were considered in the DMSTA2 analysis of STA-2 under Alternative No. 1, and are described as follows;

- **2010 Min:** This case was developed upon the assumption that the new control structure in the Hillsboro Canal would remain closed at all times other than when water supply releases to the LEC are being made down the Hillsboro Canal, resulting in a minimum estimate of the inflow volumes and TP loads to STA-2. In development of those inflow volumes and loads, it was assumed that the simulated daily discharges in runoff from the entire S-2/S-6 basin was uniformly distributed throughout the basin, with the result that inflows to STA-2 would be limited to 52% of the S-2/S-6 Basin runoff. All other inflows to the Hillsboro Canal would be considered as diverted through the Cross Canal to the North New River Canal.

- **2010 Alt1:** This case varies from “2010 Min” in that the new control structure in the Hillsboro Canal was considered to open under high rates of total inflow to the

Hillsboro Canal at its confluence with the Cross Canal. A firm capacity for diversion of the accumulated Hillsboro Canal inflows at that point through the Cross Canal to the North New River Canal was assigned; daily inflows exceeding that assigned firm rate of diversion were considered discharged through the new control structure to Pumping Station S-6, and added to the inflows from the S-2/S-6 South Sub-basin in computation of the total inflows to STA-2. The firm rate of diversion through the Cross Canal to the North New River Canal was estimated through an iterative analysis in which the diversion rate was successively lowered until such time as the mean estimate of the long-term geometric mean TP concentration in discharges from STA-2 approached 10 ppb. The assigned firm rate of diversion resulting from that analysis is 2,000 cfs (e.g., all inflows to the Hillsboro Canal at its confluence with the Cross Canal equal to or less than 2,000 cfs were considered diverted through the Cross Canal to the North New River Canal; on those days when those inflows exceeded 2,000 cfs, the differential was assigned to STA-2).

5.2. Summary of DMSTA2 Results

Table 5.2 presents a summary of the results of the DMSTA2 analyses for STA-2. Summary DMSTA2 input and output data for each case are included in Appendix A.

Table 5.2 Summary of DMSTA2 Analyses, STA-2, WY 1966-2000

Parameter	Units	Summary of Results by Case	
		2010 Min	2010 Alt1
Average Annual Inflow			
Volume	1,000 ac-ft	150.7	180.7
TP Load	metric tons	15.25	20.27
FWM TP Concentration	ppb	82	91
Average Annual Outflow			
Volume	1,000 ac-ft	154.8	184.8
FWM TP Concentration			
Upper Confidence Limit	ppb	9.9*	14.5*
Mean Estimate	ppb	11.7*	16.9
Lower Confidence Limit	ppb	14.1*	20.2
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	6.8	8.6
Mean Estimate	ppb	8.5	11.1
Lower Confidence Limit	ppb	10.8	14.3
TP Load (Using Mean FWM Conc.)	metric tons	2.23	3.86
For Detailed Results, See Appendix A		Table A.4	Table A.5
Summary of Bypasses and Diversions			
Water Supply to LEC			
Volume	1,000 ac-ft	0.8	0.8
TP Load	metric tons	0.09	0.09
FWM TP Concentration	ppb	84	84
Diversion to NNRC			
Volume	1,000 ac-ft	318.3	288.3
TP Load	metric tons	56.80	51.78
FWM TP Concentration	ppb	145	146

* Projected flow-weighted mean TP concentration in outflows less than calibration range lower limit of 15 ppb

5.2.1. Availability of Sufficient Pumping Capacity

The 2,925-cfs design capacity of Pumping Station S-6 was originally developed to provide a removal rate of ¾” per day from a tributary area of 146 square miles (93,440 acres). Should Alternative No. 1 be implemented, the total area of the S-2/S-6 South Sub-basin would be 62,300 acres. Of that total, 9,465 acres are tributary to Pumping Station G-328 located along the STA-2 Supply Canal downstream of S-6. G-328 was constructed as a part of the overall STA-2 project to replace a previous agricultural pumping station that was tributary to the Hillsboro Canal at S-6. As a result, under Alternative No. 1 a total area of approximately 52,835 acres would be directly tributary to Pumping Station S-6. At the original design removal rate of ¾” per day, an S-6 pump capacity of 1,665 cfs would be needed to serve that area.

In the simulations conducted for Alternative No. 1, the maximum daily rate of inflow to the Hillsboro Canal at its confluence with the Cross Canal over Water Years 1966-2000 was estimated to be 3,596 cfs, occurring on June 28, 1999. Given a firm rate of diversion of 2,000 cfs through the Cross Canal to the Hillsboro Canal, a peak daily discharge of 1,596 cfs would be delivered through the new control structure to S-6. That peak rate, if coupled with the minimum design removal rate of 1,665 cfs from the remnant of the S-2/S-6 Basin tributary to S-6, would result in an apparent required capacity of 3,261 cfs, exceeding the design capacity at S-6 by 336 cfs.

Over the entire 35 water years of the simulation, the total inflow to the Hillsboro Canal at its confluence with the Cross Canal exceeded 3,260 cfs (sum of the firm diversion capacity of 2,000 cfs and the available capacity at S-6 of 2,925-1,665=1,260 cfs) on a total of 92 days; the average annual volume of those inflows excess of 3,260 cfs was estimated to be 629 acre-feet per year. Inflows to the Hillsboro Canal at its confluence with the Cross Canal exceeding 3,260 cfs could, by this analysis, be expected to trigger backpumping to Lake Okeechobee at S-2. However, the simulations assume that all discharges from the EBWCD, the East Shore Water Control District, and the 715 Farms Chapter 298 districts are delivered to the main canals of the EAA and delivered to the STAs for treatment. An average annual volume of 629 acre-feet is equivalent to 1.4% of those diversions.

Prior to implementation of Alternative No. 1, detailed hydraulic analyses should be conducted to more rigorously evaluate the need for additional pumping capacity at S-6, in which the maximum design rates of removal from the EAA are coupled with the design capacities of the principal discharge structures for those three Chapter 298 districts.

6. NEW STA ON COMPARTMENT B

A summary of the estimated average annual inflows to the North New River Canal (NNRC) south of the Cross Canal (e.g., those inflows to be accommodated in the various stormwater treatment areas) is presented in Table 6.1. That summary includes those volumes and TP loads diverted from the Hillsboro Canal (S-2/S-6 Basin) through the Cross Canal under this Alternative No. 1.

Table 6.1 Estimated Average Annual Inflows to NNRC, W.Y. 1966-2000

Source	Potential Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
S-2/S-6 Basin Diversion	288,313	51,782	146	See Table 5.2 (For Alternative 1)
S-2/S-7 Basin Runoff	109,310	10,747	80	Deliverable 1.2A, Table 3.5 (Simulated as delivered to STA-3/4)
S-2/S-7 Basin Runoff	72,078	7,235	81	Deliverable 1.2A, Table 3.6 (Simuated as delivered to A-1 Reservoir)
Lake Okeechobee Releases at S-351				
Water Supply Bypass	11,484	1,189	84	Deliverable 1.2A, Table 6.7
Flow-thru to STAs	1,551	132	69	Deliverable 1.2A, Table 6.10
To A-1 Reservoir	131,928	16,689	103	Deliverable 1.2A, Table 6.14
Total Inflow	614,664	87,774	116	
Assumed Bypass	11,484	1,189	84	Water Supply to LEC
Inflow to be Treated	**603,180**	**86,585**	**116**	

The inflows to be treated from Table 6.1 must be accommodated in one of the following three water bodies:

- The EAASR Compartment A-1;
- A new stormwater treatment area developed on Compartment B of the Talisman Land Exchange;
- As direct inflow to STA-3/4.

For Alternative No. 1, the hierarchy for distribution of the inflows to the receiving water bodies was established as follows:

1. First, all daily inflows to the EAASR Compartment A-1 resulting from the ECP2010 SFWMM simulation were deducted from the total inflows to the NNRC and included in the inflow time series to Compartment A-1.
2. Second, the remaining inflows to the NNRC were delivered to the new stormwater treatment area on Compartment B of the Talisman Land Exchange, up to the assigned capacity of a new inflow pumping station lifting flows from the NNRC to the new treatment area.
3. All inflows to the NNRC remaining after the above deliveries (other than water supply bypass flows) were delivered directly to STA-3/4 at Pumping Station G-370.

Both the estimated daily discharges in the NNRC and the estimated TP concentration in those discharges are influenced by the diversion from the NNRC basin. Discharges diverted from the S-2/S-6 Basin (which include discharges diverted from the S-5A Basin) typically exhibit higher TP concentrations than the current sources of inflow to the NNRC, with the result that the daily TP concentrations in waters delivered to the EAASR Compartment A-1 and STA-3/4 can be expected to vary (typically increase) from those developed in Deliverable 1.2A.

The capacity of the new pumping station for the new stormwater treatment area on Compartment B was an unknown quantity for this analysis. The desirable capacity of the new inflow pump station was estimated through an iterative analysis, in which the capacity was varied and the influence of that capacity on the projected outflow TP concentrations from both the new STA on Compartment B and STA-3/4 was assessed. It was concluded as a result of that iterative analysis that the capacity of the new inflow pump station to Compartment B should be established at the maximum hydraulic capacity of the treatment area itself (which is also an unknown quantity for this analysis).

For this analysis, the capacity of the new pumping station was established at 1,600 cfs, which is believed to closely approach the hydraulic capacity of the new STA. Future analyses which can consider the detailed hydraulics of the new STA may result in some modification to the assigned capacity of its inflow pumping station.

The above estimate of the peak hydraulic capacity of the expanded STA-2 is an initial approximation only, and was developed without benefit of topographic data over much of Compartment B. Ongoing hydraulic analyses by ADA Engineering suggest that, in particular, the assumed hydraulic capacity of Cells 4A through 4D may be less than that considered herein. It is probable that future, more detailed hydraulic analyses would result in some adjustment to the overall hydraulic capacity of the expanded STA-2, as well as a redistribution of that peak inflow between the various flow paths. Such adjustments, if necessary, could be expected to result in a modified distribution of volumes and TP loads to STA-2 and Compartment B, with attendant impact on the projected performance of each of those two treatment areas.

6.1. Assumed Configuration of New STA on Compartment B

For this analysis, the new stormwater treatment area on Compartment B was assumed to consist of four cells in series, occupying the entire Compartment B (including Cell 4 of

STA-2, which is assumed to be hydraulically severed from the existing STA-2). The following summarizes the assumed configuration of the new STA on Compartment B:

1. Cell No. 1 would be the most upstream cell, and would consist of that part of Compartment B of the Talisman Land Exchange lying north of Cell 4. Inflows to Cell No. 1 would consist of discharges from a new inflow pumping station on the NNRC at the northwest corner of Cell 1 (assigned capacity of 1,600 cfs, as discussed above). Discharges from that new inflow pumping station would be directed to an east-west inflow distribution canal along the north line of Cell 1, and would, from that inflow distribution canal, flow south to Cell 2. The estimated effective treatment area of Cell 1 is 17.32 square kilometers (4,280 acres). Cell No. 1 was assumed to be vegetated with emergent vegetation, and considered as EMG_3 in the DMSTA2 analysis of Compartment B.

2. Cell No. 2 would consist of what is now termed Cell 4 of STA-2. It would receive outflows from Cell No. 1, and carry those flows south to new Cell No. 3. The estimated effective treatment area of Cell No. 2 is 7.70 square kilometers (1,900 acres). Cell No. 2 was assumed to be vegetated with Submerged Aquatic Vegetation, and considered as SAV_3 in the DMSTA2 analysis of Compartment B.

3. Cell No. 3 would consist of that part of Compartment B of the Talisman Land Exchange lying south of Cell No. 2 and STA-2 and westerly of the Florida Power & Light (FPL) high-voltage overhead transmission line traversing Compartment B from southwest to northeast. It would receive outflows from Cell No. 2 and carry those flows southeasterly to the access roadway serving the FPL overhead transmission line, which would serve to separate Cell No. 3 from Cell No. 4. The estimated effective treatment area of Cell No. 3 is 1,380 acres. Cell No. 3 was assumed to be vegetated with Submerged Aquatic Vegetation, and considered as SAV_3 in the DMSTA2 analysis of Compartment B.

4. Cell No. 4 would consist of that part of Compartment B of the Talisman Land Exchange lying between the FPL high-voltage overhead transmission line and Levee L-6. It would receive outflows from Cell No. 3 and carry those flows

southeasterly to L-6. The estimated effective treatment area of Cell No. 4 is 1,380 acres. Cell No. 4 was assumed to be vegetated with Submerged Aquatic Vegetation, and considered as SAV_3 in the DMSTA2 analysis of Compartment B.

The total effective treatment area in the new STA on Compartment B is estimated to be 8,940 acres.

6.2. DMSTA2 Analysis for Compartment B

Table 6.2 summarizes the results of the DMSTA2 analysis for Compartment B; summary input and output data are included in Appendix A.

Table 6.2 Summary of DMSTA2 Analysis, Compartment B, W.Y. 1966-2000

Parameter	Units	Summary of Results
		2010 Alt1
Average Annual Inflow		
Volume	1,000 ac-ft	291.1
TP Load	metric tons	44.07
FWM TP Concentration	ppb	123
Average Annual Outflow		
Volume	1,000 ac-ft	290.2
FWM TP Concentration		
Upper Confidence Limit	ppb	12.6
Mean Estimate	ppb	16.5
Lower Confidence Limit	ppb	21.8
Geometric Mean TP Conc.		
Upper Confidence Limit	ppb	9.8
Mean Estimate	ppb	13.4
Lower Confidence Limit	ppb	18.6
TP Load (Using Mean FWM Conc.)	metric tons	5.89
For Detailed Results, See Appendix A		Table A.6
Summary of Bypasses and Diversions		
Water Supply Bypass to LEC		
Volume	1,000 ac-ft	11.5
TP Load	metric tons	1.19
FWM TP Concentration	ppb	84
Divert to A-1 Reservoir (daily volume per ECP 2010 SFWMM Simulation)		
Volume	1,000 ac-ft	204.0
TP Load	metric tons	27.04
FWM TP Concentration	ppb	107
Deliver to STA-3/4 at G-370		
Volume	1,000 ac-ft	108.3
TP Load	metric tons	15.43
FWM TP Concentration	ppb	115

* Projected flow-weighted mean TP concentration in outflows less than calibration range lower limit of 15 ppb for SAV_3

7. EAASR COMPARTMENT A-1

Summaries of the estimated average annual inflows to Compartment A-1 of the EAA Storage Reservoir Project are presented in Table 7.1. Summary data are presented for two cases:

- As developed from the ECP 2010 SFWMM simulation and the monthly TP concentrations developed in Deliverable 1.3.2;
- As modified to correspond to adjusted daily TP concentrations resulting from Alternative No. 1.

Table 7.1 Estimated Average Annual Inflows to EAASR A-1, W.Y. 1966-2000

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
Inflows Taken from ECP 2010 SFWMM Simulation with TP loads from Deliverable 1.2A				
S-2/S-7 Basin Runoff	72,078	7,235	81	Deliverable 1.2A Table 3.6
S-3/S-8 Basin Runoff	59,784	5,910	80	Deliverable 1.2A, Table 3.11*
Lake Okeechobee Releases				
S-351	131,928	16,689	103	Deliverable 1.2A, Table 6.14
S-354	152,793	16,968	90	Deliverable 1.2A, Table 6.16
Total Inflow	**416,583**	**46,802**	**91**	
Inflows Modified for Alternative 1				
North New River Canal	204,003	26,794	106	Includes both basin runoff and Lake Okeechobee releases at S-351; see Table 6.2
S-3/S-8 Basin Runoff	59,784	5,910	80	
Lake Release at S-354	152,793	16,968	90	Deliverable 1.2A, Table 6.16
Total Inflow	**416,580**	**49,672**	**97**	

* TP load and concentration modified from that shown in Deliverable 1.2A to reflect adjustment to eliminate influence of negative daily loads on results; net effect is addition of 10 kg/yr to TP load

The DMSTA2 analysis of the operation and estimated TP reduction in the EAASR Compartment A-1 was conducted to maintain, to the maximum extent practicable, the daily inflow volumes, outflow volumes (both to STA-3/4 and as irrigation supply to the EAA), and daily stages taken from the ECP 2010 SFWMM simulation. However, it was not possible to exactly match those simulated data in the DMSTA2 analysis of Compartment A-1, for reasons discussed below.

7.1. SFWMM Simulation of EAASR Compartment A-1

The basic structure of the EAASR Compartment A-1 considered in the ECP 2010 SFWMM simulation is summarized graphically in Figure 7.1, taken from Deliverable 1.2A.

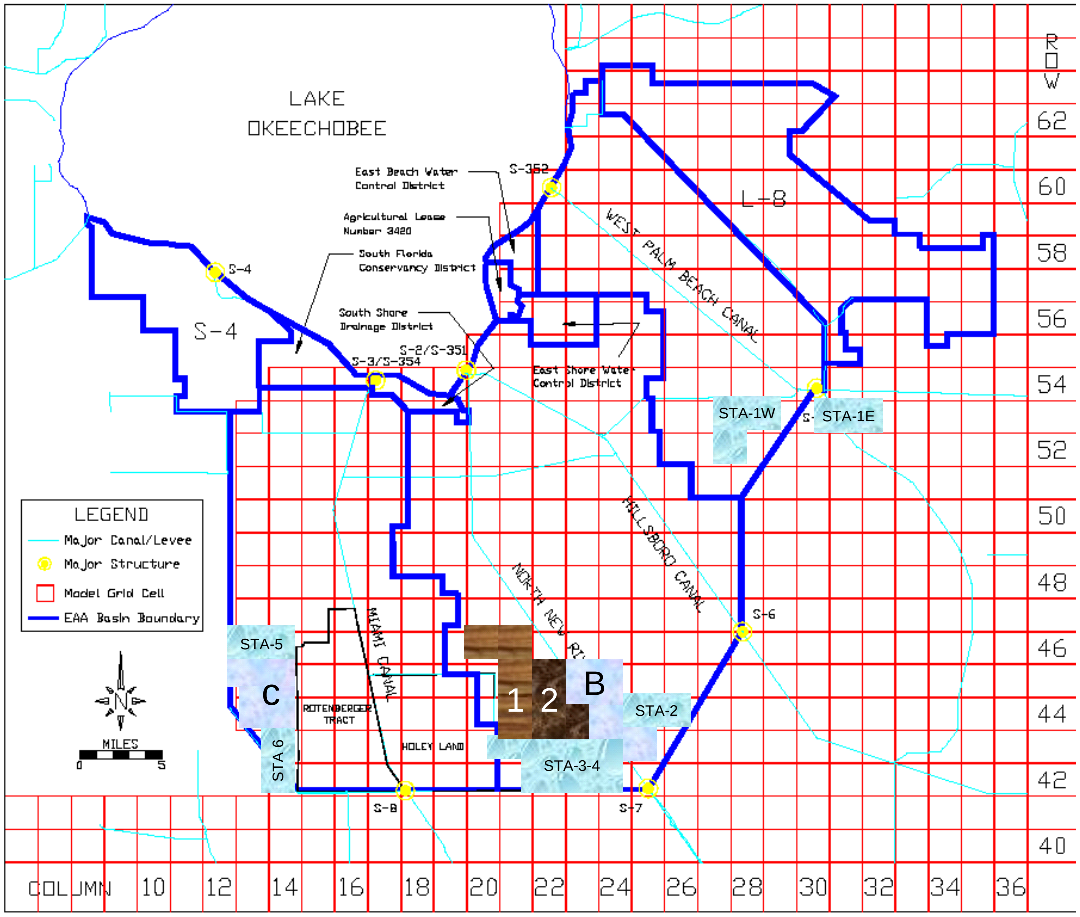

Figure 7.1 ECP 2010 Model Configuration for EAASR Compartment A-1

Flow terms reflected in the ECP 2010 SFWMM model of the EAASR Compartment A-1 are shown in Figure 7.2, also taken from Deliverable 1.2A.

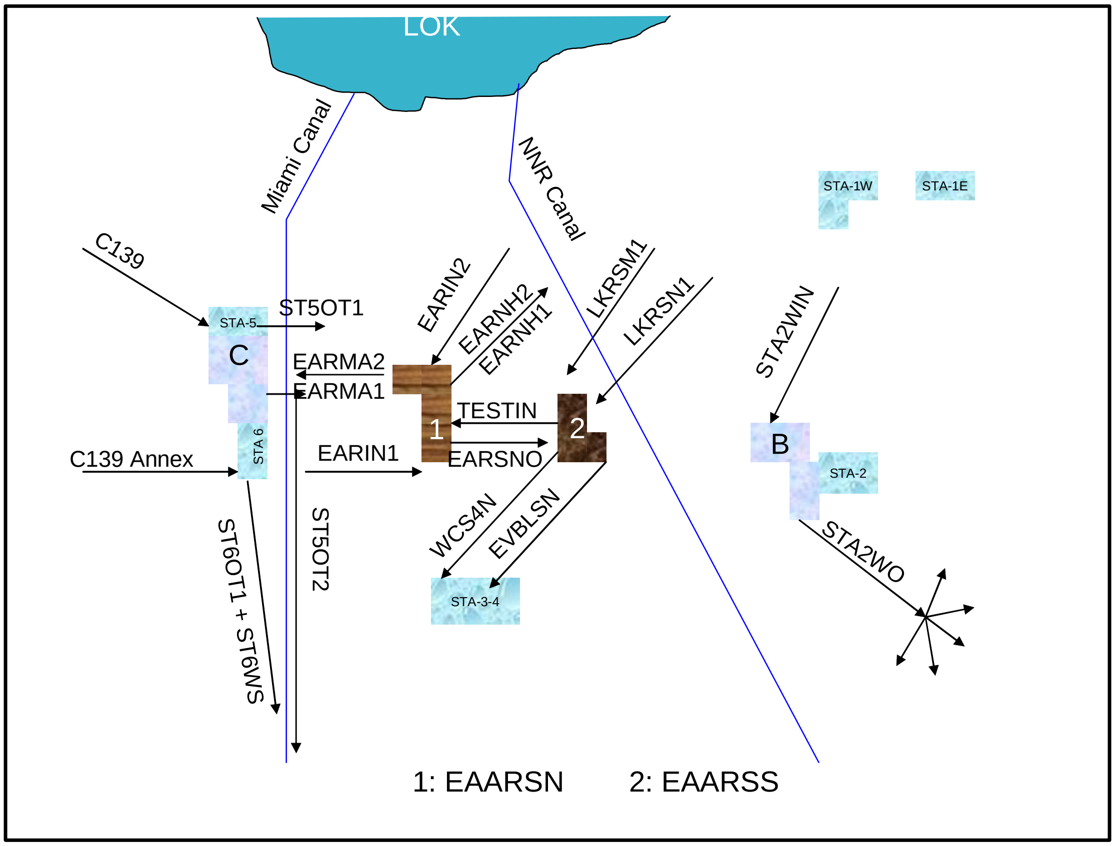

Figure 7.2 Flow Terms in ECP 2010 Model of EAASR Compartment A-1

The A-1 Reservoir introduces a number of new flow terms to the SFWMM model (Figure 7.2). The new reservoir-related terms are defined below:

- EARIN1 = Inflow into proposed EAA reservoir (Compartment 1) from Miami Canal (runoff + LOK regulatory releases)
- EARIN2 = Inflow into proposed EAA reservoir (Compartment 1) from NNR Canal (runoff + LOK regulatory releases)
- EARMA1 = Outflow from proposed EAA reservoir (Compartment 1) to meet Miami Canal basin supplemental demands
- EARMA2 = Outflow from proposed EAA reservoir (Compartment 1) to meet Miami Canal basin supplemental demands that EARMA1 does not meet

- EARNH1 = Outflow from proposed EAA reservoir (Compartment 1) to meet NNR-Hillsboro Canal basin supplemental demands
- EARNH2 = Outflow from the proposed EAA reservoir (Compartment 1) to meet NNR-Hillsboro canal basin supplemental demands that EARNH1 does not meet
- EVBLSN = Environmental water supply from subsurface water down to 1.5 feet below land surface from the northern surge tank in EAA reservoir
- EVBLSS = Environmental water supply from subsurface water down to 1.5 et below land surface from the southern surge tank in EAA reservoir
- LKRSM1 = Excess water from Lake Okeechobee via Miami Canal to northern surge tank of the EAA reservoir
- LKRSM2 = Excess water from Lake Okeechobee via Miami Canal to southern surge tank of the EAA reservoir
- LKRSN1 = Excess water from Lake Okeechobee via NNRC to the northern surge tank of the EAA reservoir
- LKRSN2 = Excess water from Lake Okeechobee via NNRC to the southern surge tank of the EAA reservoir
- WCS4N = Outflow (surface water only) for environmental water supply purposes from northern surge tank of the EAA reservoir to WCA-3A via STA-3/4
- WCS4S = Outflow (surface water only) for environmental water supply purposes from southern surge tank of the EAA reservoir to WCA-3A via STA-3/4

The terms of primary interest to this analysis are WCS4N, WCS4S, EVBLSS and EVBLSN (those discharges from the Reservoir to STA-3/4). Although the Reservoir was simulated as two surge tanks in the ECP 2010 simulation, the present design intent is to construct Compartment A-1 as a single cell.

7.2. DMSTA2 Analysis of Compartment A-1

It was necessary to make certain approximations and adjustments to the results of the ECP 2010 simulation to analyze the Compartment A-1 reservoir in DMSTA2. Certain of those adjustments were necessary to address operational controls inherent in DMSTA2; principal among those was that DMSTA2 is constrained to not make deliveries when the stage in the reservoir is below ground surface. An additional significant approximation was the need to consider the two "surge tanks" of the ECP 2010 simulation as a single cell. Toward that end, the simulated daily depths in each of the two "surge tanks" were averaged to define a composite depth. As DMSTA2 is constrained not to make deliveries when the depth in the reservoir is below ground surface, the reservoir was analyzed in DMSTA2 to limit discharges to reservoir depths of 10 centimeters or more.

An iterative analysis of the reservoir was conducted to result in maintenance of all originally simulated discharges to STA-3/4, principally by varying the seepage loss coefficient until such time as the targeted volume of discharge to STA-3/4 was attained, while attempting to mirror, to the extent practicable, the averaged reservoir depth taken from the ECP 2010 SFWMM simulation. Compartment A-1 was analyzed upon the assumption of a net surface area (effective storage area in the reservoir) of 16,000 acres.

Table 7.2 summarizes the range of depths in the reservoir as taken from the ECP 2010 simulation for each "surge tank"; the results of the daily averaging of those depths; and parallel data taken from the DMSTA2 simulation.

Table 7.2 Simulated Reservoir Depths

Description	Simulated Depth in feet		
	Maximum	Minimum	Mean
As Taken from the ECP 2010 ECP Simulation			
North "Surge Tank"	13.85	-1.43	9.08
South "Surge Tank"	12.72	-3.54	3.34
Average of Daily Values	13.23	-2.23	6.21
As Taken from the DMSTA2 Analysis			
Compartment A-1	12.57	0.03	5.41

Table 7.3 presents a summary of the results of the DMSTA2 analysis of Compartment A-1 of the EAASR.

Table 7.3 Results of DMSTA2 Analysis of EAASR Compartment A-1

Parameter	Units	Summary of Results
		A1 2010
Average Annual Inflow		
Volume	1,000 ac-ft	416.9
TP Load	metric tons	49.95
FWM TP Concentration	ppb	97
Average Annual Outflow to STA-3/4		
Volume	1,000 ac-ft	235.1
FWM TP Concentration		
Upper Confidence Limit	ppb	73.4
Mean Estimate	ppb	80.5
Lower Confidence Limit	ppb	85.8
Geometric Mean TP Conc.		
Upper Confidence Limit	ppb	71.3
Mean Estimate	ppb	79.8
Lower Confidence Limit	ppb	86.3
TP Load (Using Mean FWM Conc.)	metric tons	23.33
For Detailed Results, See Appendix A		Table A.7
Summary of Total Irrigation Releases to EAA		
Taken Directly from ECP 2010 SFWMM Simulation*		
Volume	1,000 ac-ft	180.0
TP Load	metric tons	N/A
FWM TP Concentration	ppb	N/A
From Alternative 1 Analysis**		
Volume	1,000 ac-ft	145.7
TP Load	metric tons	15.35
FWM TP Concentration	ppb	85

*Taken from Deliverable 1.2A Table 7.1
**Release volumes and TP loads are approximate; due to adjustments for modeling Reservoir in DMSTA2 (see text)

The simulated average annual outflow to STA-3/4 (235,100 acre-feet per year) closely approximates that taken from the SFWMM ECP 2010 simulation (233,685 acre-feet per year). While Table 7.3 suggests a significant variance between the DMSTA2 and SFWMM simulations for irrigation releases to the EAA, that variance is considered to result more from the approximations necessary to conduct the DMSTA2 simulation than from a true "shortfall" in those irrigation releases.

8. STA-3/4

For this analysis, all enhancements to STA-3/4 recommended in the Long-Term Plan are considered complete, including the conversion of Cell 1B to SAV. The District is currently evaluating methods to convert this cell from emergent to SAV in a manner that would allow continued flow-through operations in lieu of a method that would require taking the cell completely offline to complete the conversion.

Inflows to STA-3/4 include discharges from Pumping Station G-370 (on the North New River Canal); G-372 (on the Miami Canal); and releases from Compartment A-1 of the EAASR. Those inflows are considered to include:

- Basin runoff from the S-2/S-7 Basin (North New River Canal);
- Regulatory releases from Lake Okeechobee at S-351 directed to the North New River Canal;
- Basin runoff from the S-3/S-8 Basin (Miami Canal);
- Basin runoff from the Chapter 298 South Shore Drainage District (SSDD) diverted from Lake Okeechobee (diverted to the Miami Canal);
- Basin runoff from the Chapter 298 South Florida Conservancy District No. 5 (SFCD), also known as the S-236 Basin, diverted to the Miami Canal;
- Basin runoff from the C-139 Basin diverted to the Miami Canal through Structure G-136 (term “G136SO” from the ECP 2006 SFWMM simulation);
- Regulatory releases from Lake Okeechobee at S-354 directed to the Miami Canal;
- Discharges from the EAASR Compartment A-1.

In development of the SFWMM 2010 ECP simulation on which the estimated inflow volumes and TP loads are based, certain significant changes in overall system management from historic operations were assumed. Those assumptions include the following that directly and materially influence the projected performance of STA-3/4 in reducing total phosphorus loads and concentrations:

- Water supply releases to the North New River Canal at S-351 destined for the Lower East Coast Service Area 2 (terms “WL1351”and “WL3351” in the 2010 ECP simulation) would only be made when the stage in WCA-2A (for “WL 1351”) or WCA-3A (for “WL-3351”) is at or below the floor of their regulation schedules, and would bypass STA-3/4.

- Water supply releases to the Seminole Tribe’s Big Cypress Reservation at S-354 would bypass STA-3/4.

Implementation of each of the above assumptions in the Operations Plan for STA-3/4 and related elements of the system is critical to the water quality improvement performance projections presented herein.

In addition, the total phosphorus concentration in discharges from the C-139 Basin through G-136 were assumed reduced by 10% from historic levels as a result of ongoing BMP implementation in that basin. A summary of the estimated average annual inflows to STA-3/4 is presented in Table 8.1. Inflow data is summarized for two basic cases:

- As taken directly from the information presented in Deliverable 1.2A (for that case, discharges from the reservoir are assigned TP concentrations equal to that in reservoir inflows, and thus would not reflect reductions due to passing through the reservoir);

- As modified for Alternative No. 1, including those adjustments previously described for operation of the new STA on Compartment B of the Talisman Land Exchange and for Compartment A-1 of the EAASR.

Table 8.1 Estimated Inflows to STA-3/4

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
Inflows Taken from ECP 2010 SFWMM Simulation with TP loads from Deliverable 1.2A				
S-2/S-7 Basin	109,310	10,747	80	Deliverable 1.2A, Table 3.5
S-3/S-8 Basin	170,624	17,460	83	Deliverable 1.2A, Table 3.10
SSDD	10,559	1,390	107	Deliverable 1.2A, Table 2.9
SFCD	21,145	3,183	122	Deliverable 1.2A, Table 2.12
C-139 Basin (G-136)	13,204	2,958	182	Deliverable 1.2A, Table 4.3
Lake Flow Through Release at S-351	1,551	132	69	Deliverable 1.2A, Table 6.10
Lake Flow Through Release at S-354	26,581	2,115	65	Deliverable 1.2A, Table 6.12
Lake WS Release at S-351	11,484	1,189	84	Deliverable 1.2A, Table 6.7
Lake WS Release at S-354	109,279	9,391	70	Deliverable 1.2A, Table 6.9
A-1 Reservoir Outflow to STA-3/4	233,685	26,254	91	Volume from Deliverable 1.2A, Table 7.1; TP concentration assigned equal to flow-weighted mean TP concentration in A-1 Reservoir inflows
Total Inflow	707,422	74,819	86	
Assumed Bypass	120,763	10,580	71	Water Supply to LEC and Big Cypress Reservation
Inflow to be Treated	**586,659**	**64,239**	**89**	
Inflows Modified for Alternative 1				
NNRC at G-370	108,286	15,485	115	Includes both basin runoff and Lake Okeechobee releases at S-351, see Table 6.2
S-3/S-8 Basin	170,624	17,460	83	Deliverable 1.2A, Table 3.10
SSDD	10,559	1,390	107	Deliverable 1.2A, Table 2.9
SFCD	21,145	3,183	122	Deliverable 1.2A, Table 2.12
C-139 Basin (G-136)	13,204	2,958	182	Deliverable 1.2A, Table 4.3
Lake Flow Through Release at S-354	26,581	2,115	65	Deliverable 1.2A, Table 6.12
Lake WS Release at S-351	11,484	1,189	84	Deliverable 1.2A, Table 6.7
Lake WS Release at S-354	109,279	9,391	70	Deliverable 1.2A, Table 6.9
A-1 Reservoir Outflow to STA-3/4	235,100	23,332	81	TP Load and Concentration based on mean estimate from DMSTA2 analysis, see Table 7.2
Total Inflow	706,262	76,503	88	
Assumed Bypass	120,763	10,580	71	Water Supply to LEC and Big Cypress Reservation
Inflow to be Treated	**585,499**	**65,923**	**91**	

8.1. Summary of DMSTA2 Results

Table 8.2 presents a summary of the results of the DMSTA2 analyses for STA-3/4. Summary DMSTA2 input and output data are included in Appendix A.

Table 8.2 Summary of DMSTA2 Analysis, STA-3/4, WY 1966-2000

Parameter	Units	Summary of Results by Case
		STA34_Alt1
Average Annual Inflow		
Volume	1,000 ac-ft	585.7
TP Load	metric tons	65.86
FWM TP Concentration	ppb	91
Average Annual Outflow		
Volume	1,000 ac-ft	566.8
FWM TP Concentration		
Upper Confidence Limit*	ppb	15.3
Mean Estimate	ppb	18.6
Lower Confidence Limit	ppb	23.2
Geometric Mean TP Conc.		
Upper Confidence Limit*	ppb	11.5
Mean Estimate	ppb	14.6
Lower Confidence Limit	ppb	18.9
TP Load (Using Mean FWM Conc.)	metric tons	12.99
For Detailed Results, See Appendix A		Table A.8
Summary of Bypasses and Diversions		
Water Supply Bypass		
Volume	1,000 ac-ft	120.8
TP Load	metric tons	10.58
FWM TP Concentration	ppb	71

* TP Concentrations for Upper Confidence Limits approximated, see text below

The EAASR Compartment A-1 and STA-3/4 were analyzed using the “network simulation” feature of DMSTA2. The 7/01/2005 version of DMSTA2 does not include capability for a full uncertainty analysis; specifically, it cannot develop upper confidence limit estimates. The upper confidence limit concentrations reported in Table 8.2 were estimated using the following approximation:

$$\text{Log (Upper C.L.)/Log (Mean Est.)=Log (Mean Est.)/Log (Lower C.L.)}$$

9. STA-5

In this analysis, all enhancements to existing STA-5 recommended in the Long-Term Plan are assumed to be complete by the end of 2006. In addition, the proposed third flow-way at STA-5 is assumed complete, generally as described in the BODR for STA-5.

For the period 2010-2014, it is further assumed that all of Compartment C of the Talisman Land Exchange has been converted to use in a further expansion of STA-5. For this analysis, the fully expanded STA-5 is considered to consist of six parallel flow paths, each structured to contain two cells in series. Flow paths 1 through 3 (Cells 1A-3B, inclusive) are considered unchanged from the geometrics considered for the period 2006-2009 (see Deliverable 2.2). The three additional flow paths, numbered to increase from north to south, are generally described as follows:

- Flow path No. 4 (Cells 4A and 4B) is modeled as extending approximately one mile from the south line of flow path no. 3. The effective area in this flow path is assumed limited to that area lying one-half mile and more from Levee L-3 (similar to that considered for flow paths 1-3), due to anticipated higher ground surface elevations along L-3. Cell 4A is considered to provide 1,140 acres of effective treatment area; Cell 4B is considered to provide 920 acres of effective treatment area. The levee separating the two cells is assumed to be congruent with that separating Cells 3A and 3B;

- Flow path No. 5 (Cells 5A and 5B) is modeled as extending approximately 1.4 miles south of the south line of flow path no. 4, generally to the north line of STA-6 Section 2 as it is presently structured. The westerly limit of effective area in flow path no. 5 is assumed congruent with that in the more northerly four flow paths. Cell 5A is considered to provide 1,710 acres of effective treatment area; Cell 5B is considered to provide 1,370 acres of effective treatment area. The levee separating the two cells is assumed to be congruent with that separating Cells 4A and 4B;

- Flow path No. 6 (Cells 6A and 6B) is modeled as extending south from flow path no. 5 to the north line of STA-6, Section 1. For this analysis, STA-6 Section 2 is assumed to converted to use as Cell 6B in STA-5; the area lying between STA-6 Section 2 and the L-3 Borrow Canal is assumed converted to use as Cell 6A. Cell 6A is considered to provide 550 acres of effective treatment area; Cell 6B is considered to provide 1,300 acres of effective treatment area.

The total effective treatment area of the fully expanded STA-5 considered in this analysis is 13,150 acres. The upstream cell in each of the six flow paths is assumed to be vegetated with emergent macrophytes (EMG_3); the downstream cell in each of the six flow paths is assumed to be vegetated with submerged aquatic vegetation (SAV_3).

Inflows to STA-5 are limited to runoff from the C-139 Basin delivered to the L-3 Borrow Canal. Over the period Water Years 1995-2005, those total inflows are estimated to average 159,030 acre-feet per year at a flow-weighted mean TP concentration of 199 ppb (from Deliverable 1.2A, Table 4.1). That mean inflow concentration has been reduced from historic data by 10% in anticipation of reductions in basin TP load discharges resulting from continued BMP implementation in the C-139 Basin.

9.1. Cases Considered in DMSTA2 Analysis of STA-5

A total of two potential cases were considered in the DMSTA2 analysis of STA-5. The two cases considered are described as follows:

- **2010 Base:** All inflows to the L-3 Borrow Canal from the C-139 Basin over Water Years 1995-2004 are assigned to STA-5 (e.g., no bypass). Inflow concentrations are assigned at 90% of those measured over Water Years 1995-2005. The downstream cell in each flow path was analyzed using the calibration data set for SAV_3.

- **2010 Base Emg:** This case is identical to “2010 Base” with the single exception that the downstream cells (1B, 2B, 3B, 4B, 5B and 6B) were assigned the EMG_3 calibration data set in lieu of SAV_3.

As outlined above, Cases “2010 Base” and “2010 Base Emg” assumed no bypass from STA-5 to STA-6.

9.2. Summary of DMSTA2 Results

Table 9.1 presents a summary of the results of the DMSTA2 analyses for STA-5. Summary DMSTA2 input and output data for each case are included in Appendix A. Data for cases “2010 Base” and “2010 Base Emg” is for Water Years 1995-2005.

No rainfall or evapotranspiration data at STA-5 was available from the District-furnished data files after December 31, 2000. As a result, all simulation data subsequent to that date excludes rainfall and evapotranspiration. This exclusion is not expected to materially influence the results of the simulation.

Table 9.1 Summary of DMSTA2 Analyses, STA-5

Parameter	Units	Summary of Results by Case	
		2010 Base	2010 Base Emg
Average Annual Inflow			
Volume	1,000 ac-ft	159.1	159.1
TP Load	metric tons	39.14	39.14
FWM TP Concentration	ppb	199	199
Average Annual Outflow			
Volume	1,000 ac-ft	159.2	159.2
FWM TP Concentration			
Upper Confidence Limit	ppb	8.2*	14.7
Mean Estimate	ppb	9.6*	21.0
Lower Confidence Limit	ppb	11.7*	30.7
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	4.7	11.0
Mean Estimate	ppb	5.8	17.1
Lower Confidence Limit	ppb	7.8	26.5
TP Load (Using Mean FWM Conc.)	metric tons	1.89	4.13
For Detailed Results, See Appendix A		Table A.9	Table A.10

* Projected flow-weighted mean TP concentration in outflows less than calibration range lower limit of 15 ppb for SAV_3

As concluded in Deliverable 2.2, until such time as an improvement in performance is demonstrated, it is considered prudent to consider the potential range in performance of STA-5 as encompassing the full range of uncertainty in performance of the six downstream cells (e.g., range from upper limit of performance for SAV_3 to the lower limit of performance for EMG_3).

10. STA-6

For analysis of the period 2010-2014, STA-6 Section 2 is considered to have been converted to use as Cell 6B of STA-5 as described above, with the result that STA-6 as considered herein is limited to the original Section 1. Enhancements to STA-6 Section 1 originally recommended in the Long-Term Plan are assumed not to be complete, consistent with the District's intent as stated in its December 2004 amendment to the Long-Term Plan.

The single source of inflow to STA-6 over the period 2010-2014 is runoff from the C-139 Annex. That inflow is projected to average 40,176 acre-feet per year at a flow-weighted mean TP concentration of 98 ppb (average annual TP load of 4,873 kilograms), taken from Table 4.5 of Deliverable 1.2A, and based on unadjusted historic data for Water Years 1997-2005.

10.1. Cases Considered in DMSTA2 Analysis of STA-6

A total of two cases were considered in the DMSTA2 analysis of STA-6. The two cases considered are described below.

- **2010 Alt1:** This case was structured on the basic assumption that STA-6, Section 1 would be dedicated to runoff from the C-139 Annex. Vegetation in Section 1 was considered as PEW_3. The analysis considers all available data at station USSO (Water Years 1997-2005);

- **2010 Alt1 SAV:** This case is identical to the case described immediately above, with the exception that the vegetation in Section 1 was considered as SAV_3 in lieu of PEW_3.

10.2. Summary of DMSTA2 Results

Table 10.1 presents a summary of the results of the DMSTA2 analyses for STA-6. Summary DMSTA2 input and output data for each case are included in Appendix A.

Table 10.1 Summary of DMSTA2 Analyses, STA-6

Parameter	Units	Summary of Results by Case	
		2010 Alt1	2010 Alt1 SAV
Average Annual Inflow			
Volume	1,000 ac-ft	40.2	40.2
TP Load	metric tons	4.88	4.88
FWM TP Concentration	ppb	98	98
Average Annual Outflow			
Volume	1,000 ac-ft	40.3	40.3
FWM TP Concentration			
Upper Confidence Limit	ppb	19.6	14.1
Mean Estimate	ppb	25.5	17.1
Lower Confidence Limit	ppb	32.8	20.8
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	15.9	10.5
Mean Estimate	ppb	21.8	13.4
Lower Confidence Limit	ppb	28.9	17.2
TP Load (Using Mean FWM Conc.)	metric tons	1.27	0.85
For Detailed Results, See Appendix A		Table A.11	Table A.12

No rainfall or evapotranspiration data at STA-6 was available from the District-furnished data files after December 31, 2000. As a result, all simulation data subsequent to that date excludes rainfall and evapotranspiration. This exclusion is not expected to materially influence the results of the simulation.

11. SUMMARY PROJECTIONS

A summary of the projected performance of the various stormwater treatment areas over the period 2010-2014 is presented in Table 11.1. That tabulation includes identification of the specific case for each STA considered as most applicable to this summary. That tabulation also summarizes all bypass volumes and TP loads presented in earlier sections of this document. The results presented in Table 11.1 for STA-5 include the full range of uncertainty associated with the performance of the six downstream cells.

Table 11.1 Summary Projections for all STAs, Alternative 1 for 2010-2014

In this table, one or more notes following the table are applicable to cells highlighted in green

Parameter	Units	Summary of DMSTA2 Results by Treatment Area and Case								
		STA-1W 2010 Alt 1	STA-1E 2010 Base	STA-2 2010 Alt1	Comp. B 2010 Alt1	EAASR A-1 A1_2010	STA-3/4 STA34_Alt1	STA-5 2010 (Ave)	STA-6 2010 Alt1 SAV	All
Effective Treatment Area	acres	6,670	6,175	6240	8,940	16,000	16,543	13,150	897	58,615
Average Annual Inflow										
Volume	1,000 ac-ft	131.4	171.8	180.7	291.1	416.9	350.4	159.1	40.2	1741.7
TP Load	metric tons	25.8	27.03	20.3	44.1	50.0	42.59	39.14	4.88	253.78
FWM TP Concentration	ppb	160	128	91	123	97	99	199	98	118
Average Annual Outflow										
Volume	1,000 ac-ft	133.8	168.5	184.8	290.2	235.1	566.8	159.2	40.3	1543.6
FWM TP Concentration										
Upper Confidence Limit	ppb	16.6	10.1	14.5	12.6	73.4	15.3	8.2	14.1	---
Mean Estimate	ppb	18.9	13.3	16.9	16.5	80.5	18.6	15.3	17.1	17.1
Lower Confidence Limit	ppb	21.9	17.9	20.2	21.8	85.8	23.2	30.7	20.8	---
Geometric Mean TP Conc.										
Upper Confidence Limit	ppb	7.9	7.6	8.6	9.8	71.3	11.5	4.7	10.5	---
Mean Estimate	ppb	10.2	10.6	11.1	13.4	79.8	14.6	11.5	13.4	---
Lower Confidence Limit	ppb	13.4	15.0	14.3	18.6	86.3	18.9	26.5	17.2	---
TP Load (Using Mean FWM Conc.)	metric tons	3.11	2.77	3.86	5.89	23.33	12.99	3.01	0.85	32.48
Summary of Bypass Volumes and Loads										
Bypass Volume, TP Load and TP Concentration for each Treatment Area										
Volume	1,000 ac-ft	14.2	36.3	0.8	0.0	0.0	120.8	0.0	0.0	172.0
TP Load	metric tons	2.23	4.69	0.09	0.00	0.00	10.58	0.00	0.00	17.58
FWM TP Concentration	ppb	127	105	84	---	---	71	---	---	83

Notes:

(1) Surface area of EAASR Compartment A-1 excluded from computation of total effective treatment area

(2) Average annual inflows to STA-3/4 listed above include only direct inflow at G-370 and G-372; outlfow from EAASR Compartment A-1 also directed to STA-3/4

(3) Outflows from EAASR Compartment A-1 excluded from computation of total outlfows, as they are directed to STA-3/4

(4) At STA-1E and STA-2, FWM TP concentrations include estimates below the lower calibration range limit of 15 ppb for SAV_3

(5) At STA-5, upper confidence limit reported based on the assumption that the six downstream cells act as SAV_3; lower confidence limit reported based on the assumption that the six downstream cells act as EMG_3. Mean estimates of outflow concentrations and outflow TP load taken as the average of the estimates for those two conditions.

(6) STA-3/4 analyzed in DMSTA2 as a part of a network with the EAASR Compartment A-1. The 7/01/2005 version of DMSTA2 is not structured to compute the upper confidence limit of TP concentrations in a network simulation. The upper confidence limits for both FWM and Geometric mean TP concentrations were estimated as described in Part 8 of this document.

In the above table, bypasses at STA-1E are untreated bypass through S-155A. All other bypasses indicated in Table 11.1 consist of water supply releases bypassing the STAs. The sensitivity of the outflow projections to the assumption that those water supply releases bypass the STAs is examined later in this Part 11.

The total inflow volume shown in Table 11.1 varies from that reported in Table 8.1 of Deliverable 1.2A due primarily to the addition of 27,500 acre-feet per year in STA-2 inflows due to seepage return to the STA-2 Supply Canal from the L-6 Borrow Canal and WCA-2A;

The estimated values of inflow volumes and TP loads to the various STAs are materially and significantly influenced by system management choices reflected in the SFWMM 2010 ECP simulation and described in detail in earlier sections of this document. Principal among those management choices are the elimination of Lake Okeechobee regulatory releases to the West Palm Beach Canal and L-8 Borrow Canal; the assumption that Lake Okeechobee water supply releases destined for the Lower East Coast (when receiving WCA's are at or below the floor of their respective regulation schedules) and the Big Cypress Reservation will bypass the STAs; and that the volume of L-8 Basin runoff entering the C-51 West Canal will be bypassed untreated through Structure S-155A.

Table 11.2 summarizes estimated average annual back pumping or back flow to Lake Okeechobee during the period 2010-2014.

Table 11.2 Estimated Back Pumping to Lake Okeechobee, 2010-2014

Location	**Estimated Ave. Annual Discharge, WY 1966-2000**			**Remarks**
	Volume (ac-ft)	**TP Load (kg)**	**TP Conc. (ppb)**	
S-2 (S-2/S-6/S-7)	24,946	2,822	92	Deliverable 1.2A, Table 3.8
S-3 (S-3/S-8)	4,091	445	88	Deliverable 1.2A, Table 3.12
C-10A (L-8)	71,931	9,157	103	Deliverable 1.2A, Table 5.4
Total Discharge	**100,968**	**12,424**	**100**	

11.1. Potential Adjustments to Projections for STA-3/4

As noted throughout this document, the water quality analyses summarized in Table 11.1 were developed upon the assumption that water supply releases destined for the Lower East Coast and certain other destinations (such as the Big Cypress Reservation) are permitted to bypass the STAs when the receiving water conservation area is at or below the floor of its regulation schedule. For the period 2010-2014, this assumption is of particular significance only at STA-3/4.

In addition, Alternative No. 1 includes substantial enlargement of the North New River Canal, with the result that estimated back pumping to Lake Okeechobee at S-2 and S-3 might be significantly reduced from that reflected in the ECP 2010 SFWMM simulation. Hydraulic analyses of Alternative No. 1 being separately prepared by ADA Engineering Co., Inc. suggest that the back pumping at S-2 and S-3 might be largely, if not completely, eliminated as a result of the canal enlargements and added pumping capacity integral to Alternative No. 1.

Additional DMSTA2 simulations were conducted to assess the impact of inclusion of those additional volumes and TP loads in the inflow to STA-3/4.

11.1.1. Inclusion of S-2 and S-3 Back Pumped Volumes and TP Loads

The estimated average annual volumes and TP loads back pumped to Lake Okeechobee at S-2 and S-3, as summarized in Table 11.2, were assumed to be included in the inflows to STA-3/4. The STA-3/4 simulation summarized in Table 11.1 was modified to include those additional inflows. Detailed output from that DMSTA2 simulation (Case "Alt1_w_S2S3") is presented in Appendix A (Table A.13). An overall summary of the results of the analysis is presented in Table 11.3.

11.1.2. Inclusion of Water Supply Bypass in STA-3/4 Inflows

As summarized in Table 11.1, an average annual volume of approximately 120,800 acre-feet per year (at a flow-weighted mean TP concentration of 71 ppb) was assumed to bypass STA-3/4. An additional analysis was prepared to assess the potential influence of including those volumes and TP loads in STA-3/4 inflows. That analysis was conducted assuming that the projected back pumping to Lake Okeechobee at S-2 and S-3 are, for Alternative No. 1, first redirected to STA-3/4. The results of that analysis (case "2010 All") are summarized in Table 11.3 (which includes the "STA34_Alt1" case summarized in Table 11.1).

Table 11.3 Potential Adjustments to DMSTA2 Results for STA-3/4

Parameter	Units	Summary of Results by Case		
		STA34_Alt1	Alt1_w_S2S3	2010 All
Average Annual Inflow				
Volume	1,000 ac-ft	585.7	614.8	735.6
TP Load	metric tons	65.86	69.13	79.72
FWM TP Concentration	ppb	91	91	88
Average Annual Outflow				
Volume	1,000 ac-ft	566.8	595.9	715.8
FWM TP Concentration				
Upper Confidence Limit*	ppb	15.3	16.7	17.1
Mean Estimate	ppb	18.6	20.3	21.1
Lower Confidence Limit	ppb	23.2	25.0	26.4
Geometric Mean TP Conc.				
Upper Confidence Limit*	ppb	11.5	12.0	13.2
Mean Estimate	ppb	14.6	15.2	16.9
Lower Confidence Limit	ppb	18.9	19.7	22.1
TP Load (Using Mean FWM Conc.)	metric tons	12.99	14.90	18.63
For Detailed Results, See Appendix A		Table A.8	Table A.13	Table A.14
Summary of Bypasses and Diversions				
Water Supply Bypass				
Volume	1,000 ac-ft	120.8	120.8	0.0
TP Load	metric tons	10.58	10.6	0.00
FWM TP Concentration	ppb	71	71.0	---

* TP Concentrations for Upper Confidence Limits approximated, see Part 8

Appendix A

DMSTA2 Output Data

List of Tables

Table A.1 STA-1W: Case “2010 Alt1”

DMSTA2- Inputs & Outputs Project: PROJECT_STA1W Model Release: 9/30/2005
Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	2010_Alt1
Input Series Name		TS_2010Alt1
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-1W with Long Term Plan Enhancements
Alternative 1: partial diversion of S-5A North subbasin and EBWCD; firm diversion of 800 cfs
Seepage inflows from WCA-1 based on mean stage of 15.75 ft. NGVD
Cell-to-cell seepage not considered in analysis

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	18.9	21.9	16.6
GM Outflow C (ppb)	10.2	13.4	7.9
Load Reduction %	88%	86%	89%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	-0.2%	0.4%
Iterations & Convergence	3	0.2%
Warning/Error Messages	6	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	3	2A	2B	4	5A	5B				
Vegetation Type	-->	EMG_3	SAV_3	SAV_3	EMG_3	SAV_3	SAV_3	EMG_3	SAV_3				
Inflow Fraction	-	0.38			0.17			0.45					
Downstream Cell Number	-	2	3		5	6		8					
Surface Area	km2	3.02	3.02	4.15	1.91	1.91	1.45	2.27	9.28				
Mean Width of Flow Path	km	1.10	1.10	1.10	2.40	2.00	1.30	1.78	2.34				
Number of Tanks in Series	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0				
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	55	55	46	60	60	60	60	60				
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4	4				
Outflow Coefficient - Intercept	-	1	1	1	1	1	1	1	1				
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm	0.0035	0.0018	0.0023									
Inflow Seepage Control Elev	cm	172	172	185									
Inflow Seepage Conc	ppb	20	20	20									
Outflow Seepage Rate	(cm/d) / cm			0.0014	0.0016	0.0016	0.0021	0.0156	0.0049				
Outflow Seepage Control Elev	cm			-60	-46	-46	-46	-46	-46				
Max Outflow Seepage Conc	ppb			20	20	20	20	20	20				
Seepage Recycle to Cell Number	-							1	1				
Seepage Recycle Fraction	-							0.91	0.8				
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30	30				
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500	500				
Initial Water Column Depth	cm	200	200	200	200	200	200	200	200				
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3	3				
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22	22				
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300	300	300				
K = Net Settling Rate at Steady State	m/yr	16.8	52.5	52.5	16.8	52.5	52.5	16.8	52.5				
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40	40				
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100	100				
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200	200	200				

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	6.97	7.31	7.69	8.03	8.37	8.71	9.06	9.51					9.51
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05					09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65					05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65					05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00					04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784	12784	12784					12784
Cell Label		1A	1B	3	2A	2B	4	5A	5B					Total
Downstream Cell Label		1B	3	Outflow	2B	4	Outflow	5B	Outflow					-
Network Simulation Name	-	none	none	none	none	none	none	none	none					none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta					Uncerta
Surface Area	km2	3.02	3.02	4.15	1.91	1.91	1.45	2.27	9.28					27.00
Mean Rainfall	cm/yr	134.9	134.9	134.9	134.9	134.9	134.9	134.9	134.9					134.9
Mean ET	cm/yr	129.8	129.8	129.8	129.8	129.8	128.6	121.5	122.7					126.6
Cell Inflow Volume	hm3/yr	61.6	87.6	89.9	27.6	26.5	25.5	72.9	61.8					162.1
Cell Inflow Load	kg/yr	9820	7478	3212	4393	2373	792	11628	6723					25841
Cell Inflow Conc	ppb	159.5	85.3	35.7	159.5	89.5	31.0	159.5	108.7					159.5
Treated Outflow Volume	hm3/yr	87.6	89.9	91.7	26.5	25.5	24.5	61.8	48.7					165.0
Treated Outflow Load	kg/yr	7478	3212	1460	2373	792	493	6723	1158					3111
Treated FWM Outflow Conc	ppb	85.3	35.7	15.9	89.5	31.0	20.1	108.7	23.8					18.9
Upper Confidence Limit	ppb	91.7	42.8	19.5	100.4	36.5	22.8	115.5	26.2					21.9
Lower Confidence Limit	ppb	78.1	29.4	13.3	78.2	26.7	18.1	101.3	21.9					16.6
Total Outflow Volume + Bypass	hm3/yr	87.6	89.9	91.7	26.5	25.5	24.5	61.8	48.7					165.0
Total Outflow Load + Bypass	kg/yr	7478	3212	1460	2373	792	493	6723	1158					3110.9
Total FWM Outflow Conc	ppb	85.3	35.7	15.9	89.5	31.0	20.1	108.7	23.8					18.9
Bypass Load	kg/yr	0	0	0	0	0	0	0	0					0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.0
Maximum Inflow	hm3/d	1.10	1.19	1.19	0.49	0.50	0.50	1.31	1.25					2.90
Maximum Outflow	hm3/d	1.19	1.19	1.16	0.50	0.50	0.51	1.25	1.18					2.85
Surface Load Reduction	kg/yr	2342	4266	1752	2020	1582	299	4906	5565					22730
Load Trapped in Sediments	kg/yr	2889	4407	1941	1985	1618	336	2170	5325					20671
Overall Load Reduction	%	24%	57%	55%	46%	67%	38%	42%	83%					88%
Lower Confidence Limit	%	18%	52%	54%	39%	65%	40%	39%	82%					86%
Upper Confidence Limit	%	30%	61%	54%	53%	67%	35%	46%	83%					89%
Daily Geometric Mean	ppb	70.2	25.4	9.0	69.5	12.8	6.2	108.9	8.7					#N/A
Outflow Geo Mean - Composites	ppb	74.7	27.7	10.2	78.7	20.6	10.5	98.1	13.1					10.2
Upper Confidence Limit	ppb	81.0	34.63	13.6	90.2	26.0	12.9	105.8	15.4					13.4
Lower Confidence Limit	ppb	67.5	21.56	7.8	67.1	16.4	8.7	89.8	11.3					7.9
Frequency Outflow Conc > 10 ppb	%	100%	100%	49%	100%	97%	46%	100%	59%					42%
Frequency Outflow Conc > 20 ppb	%	100%	84%	7%	100%	50%	16%	100%	25%					18%
Frequency Outflow Conc > 50 ppb	%	100%	3%	0%	100%	3%	1%	100%	2%					9%
Freq Outflow Volume > 10 ppb	%	100%	100%	67%	100%	98%	69%	100%	76%					70%
95th Percentile Outflow Conc	ppb	102	48	23	104	45	33	150	43					26
Mean Biomass P Storage	mg/m2	3009	1464	468	3269	851	232	2995	575					1325
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%	0%					0%
Net Storage Turnover Rate	1/yr	11.1	34.9	34.9	11.1	34.9	34.9	11.2	34.9					20.2
Unit Area P Removal	mg/m2-yr	958	1462	467	1041	849	232	954	574					766
Mean Water Load	cm/d	5.6	8.0	5.9	4.0	3.8	4.8	8.8	1.8					1.6
Max Water Load	cm/d	36.6	39.6	28.7	25.9	26.2	34.8	57.4	13.5					10.7
Mean Depth	cm	64	65	63	55	53	51	45	42					53
Minimum Depth	cm	55	52	42	17	5	1	1	1					20
Maximum Depth	cm	98	99	100	68	70	76	86	82					87
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.2%	3.0%	8.9%	12.6%					5.3%
Flow/Width	m2/day	153	218	224	31	36	54	112	72					117.9
HRT Days	days	11.5	8.2	10.7	14.0	13.9	10.5	5.2	23.2					32.2
Mean Velocity	cm/sec	0.28	0.39	0.41	0.07	0.08	0.12	0.29	0.20					0.25
Seepage Outflow / Total Outflow	%	0%	0%	3%	4%	4%	4%	2%	6%					6%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.0
95th Percentile Outflow Volume	hm3/d	0.67	0.67	0.66	0.26	0.26	0.27	0.64	0.60					1.6
95th Percentile Outflow Load	kg/d	64.29	29.89	14.59	24.81	9.33	6.27	72.33	15.13					36.1
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					#N/A
Range Check - Mean Depth	-	-	-	-	-	0.85	0.82	-	0.68					3
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-					0
Range Check - Flow/Width	-	-	-	-	-	0.22	0.33	-	0.45					3
Range Check - Inflow Conc	-	-	-	-	-	-	-	-	-					0
Range Check - Outflow Conc	-	-	-	-	-	-	-	-	-					0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					0.00%
Mass Balance Error	%	0.02%	0.02%	0.02%	0.04%	0.05%	0.12%	-0.43%	0.02%					-0.15%
Warning or Error Messages														6

Cell# 5 2B Depth out of calib. range for SAV_3: 53 vs. 62 - 87 cm
Cell# 5 2B Flow/Width out of calib. range for SAV_3: 36 vs. 162 - 374 m2/day
Cell# 6 4 Depth out of calib. range for SAV_3: 51 vs. 62 - 87 cm
Cell# 6 4 Flow/Width out of calib. range for SAV_3: 54 vs. 162 - 374 m2/day
Cell# 8 5B Depth out of calib. range for SAV_3: 42 vs. 62 - 87 cm
Cell# 8 5B Flow/Width out of calib. range for SAV_3: 72 vs. 162 - 374 m2/day

Table A.2 STA-1E: Case "2010 All"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1E Model Release: 9/30/2005 Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	2010 All
Input Series Name		TS_2010All
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-1E with East and West Distribution Cells
Inlfows include all C-51 West Basin and Acme Basin B runoff plus L-8 Basin runoff discharged through S-5AE
Cell-to-cell seepage not considered in analysis
East and West Distribution Cells each modeled as two cells in parallel

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	19.2	24.8	14.8
GM Outflow C (ppb)	13.4	18.5	9.6
Load Reduction %	85%	80%	88%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.0%
Warning/Error Messages	6	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	EDCE	1	2	EDCW	3	4N	4S	WDCW	7	WDCE	5	6
Vegetation Type	-->	EMG_3	EMG_3	SAV_3	EMG_3	EMG_3	SAV_3	SAV_3	EMG_3	EMG_3	EMG_3	EMG_3	SAV_3
Inflow Fraction	-	0.2			0.39				0.16		0.25		
Downstream Cell Number	-	2	3		5	6	7		9	12	11.00	12.00	
Surface Area	km2	0.95	2.25	2.23	0.95	2.38	2.61	3.04	1.17	1.69	1.17	2.31	4.25
Mean Width of Flow Path	km	0.66	1.55	1.55	0.66	1.55	1.55	1.55	0.75	1.18	0.75	1.61	1.61
Number of Tanks in Series	-	0.5	3.0	3.0	0.5	3.0	3.0	3.0	0.5	3.0	0.5	3.0	3.0
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	40	60	90	40	60	60	100	40	40	40	60
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4	4	4	4	4	4
Outflow Coefficient - Intercept	-	1	1	1	1	1	1	1	1	1	1	1	1
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm									0.0054			0.0057
Inflow Seepage Control Elev	cm									69			94
Inflow Seepage Conc	ppb									20			20
Outflow Seepage Rate	(cm/d) / cm	0.0095	0.0042	0.0042	0.0095			0.0054	0.01		0.01		
Outflow Seepage Control Elev	cm	-137	-137	-99	-87			-38	-15		-76		
Max Outflow Seepage Conc	ppb	20	20	20	20			20	20		20		
Seepage Recycle to Cell Number	-	1	1	1	4			7	8		10		
Seepage Recycle Fraction	-	1	1	1	1			1					
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30	30	30	30	30	30
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500	500	500	500	500	500
Initial Water Column Depth	cm	50	50	50	50	50	50	50	50	50	50	50	50
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3	3	3	3	3	3
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22	22	22	22	22	22
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300	300	300	300	300	300	300
K = Net Settling Rate at Steady State	m/yr	16.8	16.8	52.5	16.8	16.8	52.5	52.5	16.8	16.8	16.8	16.8	52.5
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40	40	40	40	40	40
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100	100	100	100	100	100
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	10.29	10.74	11.20	11.46	11.89	12.34	12.80	13.06	13.49	13.74	14.20	14.66	14.66
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784
Cell Label		EDCE	1	2	EDCW	3	4N	4S	WDCW	7	WDCE	5	6	Total
Downstream Cell Label		1	2	Outflow	3	4N	4S	Outflow	7	6	5	6	Outflow	-
Network Simulation Name	-	none	none	none	none	none	none	none	none	none	none	none	none	none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta
Surface Area	km2	0.95	2.25	2.23	0.95	2.38	2.61	3.04	1.17	1.69	1.17	2.31	4.25	25.00
Mean Rainfall	cm/yr	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9
Mean ET	cm/yr	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7
Cell Inflow Volume	hm3/yr	51.3	63.5	57.3	100.1	100.2	100.6	100.9	41.1	36.3	64.2	58.4	95.9	256.7
Cell Inflow Load	kg/yr	6346	5293	3216	12374	10758	8321	3781	5077	3407	7932	6003	6102	31729
Cell Inflow Conc	ppb	123.6	83.3	56.2	123.6	107.3	82.7	37.5	123.6	93.9	123.6	102.7	63.6	123.6
Treated Outflow Volume	hm3/yr	63.5	57.3	52.1	100.2	100.6	100.9	101.3	36.3	37.1	58.4	58.7	99.0	252.4
Treated Outflow Load	kg/yr	5293	3216	1012	10758	8321	3781	1776	3407	2133	6003	3969	2058	4846
Treated FWM Outflow Conc	ppb	83.3	56.2	19.4	107.3	82.7	37.5	17.5	93.9	57.4	102.7	67.6	20.8	19.2
Upper Confidence Limit	ppb	86.2	63.4	24.8	109.6	89.6	45.7	22.8	99.5	67.4	106.9	77.1	26.9	24.8
Lower Confidence Limit	ppb	79.9	48.3	15.1	104.5	74.8	29.9	13.5	87.5	47.4	97.7	57.5	16.0	14.8
Total Outflow Volume + Bypass	hm3/yr	63.5	57.3	52.1	100.2	100.6	100.9	101.3	36.3	37.1	58.4	58.7	99.0	252.4
Total Outflow Load + Bypass	kg/yr	5293	3216	1012	10758	8321	3781	1776	3407	2133	6003	3969	2058	4845.6
Total FWM Outflow Conc	ppb	83.3	56.2	19.4	107.3	82.7	37.5	17.5	93.9	57.4	102.7	67.6	20.8	19.2
Bypass Load	kg/yr	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Inflow	hm3/d	0.84	0.89	0.88	1.64	1.65	1.67	1.69	0.67	0.66	1.05	1.04	1.73	4.20
Maximum Outflow	hm3/d	0.89	0.88	0.88	1.65	1.67	1.69	1.71	0.66	0.67	1.04	1.06	1.76	4.36
Surface Load Reduction	kg/yr	1052	2077	2204	1616	2437	4540	2005	1669	1274	1929	2034	4044	26883
Load Trapped in Sediments	kg/yr	924	1760	2151	1159	2518	4629	2093	1271	1344	1388	2113	4240	25589
Overall Load Reduction	%	17%	39%	69%	13%	23%	55%	53%	33%	37%	24%	34%	66%	85%
Lower Confidence Limit	%	14%	34%	64%	11%	18%	49%	50%	29%	31%	21%	28%	62%	80%
Upper Confidence Limit	%	20%	46%	72%	15%	28%	60%	55%	37%	45%	28%	41%	69%	88%
Daily Geometric Mean	ppb	76.0	50.9	13.8	101.6	76.6	29.1	11.5	88.4	49.7	97.7	60.2	13.8	#N/A
Outflow Geo Mean - Composites	ppb	77.2	51.4	14.3	102.5	77.3	29.8	12.1	89.3	50.5	98.5	60.9	14.5	13.4
Upper Confidence Limit	ppb	79.9	58.97	19.3	105.1	84.9	38.0	16.8	95.5	60.9	103.3	71.1	20.1	18.5
Lower Confidence Limit	ppb	73.7	43.33	10.4	99.3	68.7	22.5	8.6	82.3	40.1	92.8	50.2	10.4	9.6
Frequency Outflow Conc > 10 ppb	%	100%	100%	80%	100%	100%	100%	63%	100%	100%	100%	100%	79%	73%
Frequency Outflow Conc > 20 ppb	%	100%	100%	20%	100%	100%	88%	15%	100%	100%	100%	100%	23%	41%
Frequency Outflow Conc > 50 ppb	%	100%	57%	0%	100%	100%	7%	0%	100%	55%	100%	88%	0%	19%
Freq Outflow Volume > 10 ppb	%	100%	100%	92%	100%	100%	100%	81%	100%	100%	100%	100%	91%	88%
95th Percentile Outflow Conc	ppb	99	66	27	126	93	51	26	104	68	116	78	30	28
Mean Biomass P Storage	mg/m2	3051	2456	967	3847	3322	1777	690	3443	2498	3726	2873	1000	2095
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Net Storage Turnover Rate	1/yr	11.1	11.1	34.9	11.1	11.1	34.9	34.9	11.0	11.1	11.1	11.1	34.9	17.1
Unit Area P Removal	mg/m2-yr	971	782	965	1218	1058	1773	688	1087	795	1186	915	998	1023
Mean Water Load	cm/d	14.8	7.7	7.0	28.8	11.5	10.5	9.1	9.6	5.9	15.0	6.9	6.2	2.8
Max Water Load	cm/d	88.3	39.4	39.5	172.1	69.2	63.9	55.6	57.4	39.0	89.7	45.0	40.7	16.8
Mean Depth	cm	68	53	62	94	60	66	66	101	51	62	52	66	64
Minimum Depth	cm	51	40	56	90	40	59	57	90	34	37	35	56	52
Maximum Depth	cm	107	86	86	125	101	101	102	104	86	108	89	102	98
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Flow/Width	m2/day	213	112	101	415	177	178	178	150	84	234	99	163	160.7
HRT Days	days	4.6	6.9	8.8	3.2	5.2	6.3	7.3	10.5	8.6	4.1	7.5	10.6	22.8
Mean Velocity	cm/sec	0.36	0.24	0.19	0.51	0.34	0.31	0.31	0.17	0.19	0.44	0.22	0.29	0.29
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	0%	0%	0%	12%	0%	9%	0%	0%	4%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95th Percentile Outflow Volume	hm3/d	0.41	0.40	0.40	0.73	0.74	0.76	0.77	0.29	0.30	0.45	0.46	0.78	1.9
95th Percentile Outflow Load	kg/d	40.41	25.20	9.85	90.51	69.82	34.86	18.15	30.12	19.38	50.83	34.95	21.04	49.2
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Range Check - Mean Depth	-	-	-	-	1.22	-	-	-	1.32	-	-	-	-	2
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Flow/Width	-	1.01	-	0.63	1.98	-	-	-	-	-	1.12	-	-	4
Range Check - Inflow Conc	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Outflow Conc	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mass Balance Error	%	0.00%	0.00%	0.01%	0.00%	0.01%	0.01%	0.01%	0.00%	0.01%	0.00%	0.00%	0.00%	0.01%
Warning or Error Messages		Cell# 1 EDCE Flow/Width out of calib. range for EMG_3: 213 vs. 26 - 210 m2/day Cell# 3 2 Flow/Width out of calib. range for SAV_3: 101 vs. 162 - 374 m2/day Cell# 4 EDCW Depth out of calib. range for EMG_3: 94 vs. 35 - 76 cm Cell# 4 EDCW Flow/Width out of calib. range for EMG_3: 415 vs. 26 - 210 m2/day Cell# 8 WDCW Depth out of calib. range for EMG_3: 101 vs. 35 - 76 cm Cell# 10 WDCE Flow/Width out of calib. range for EMG_3: 234 vs. 26 - 210 m2/day												6

Table A.3 STA-1E: Case "2010 Base"

DMSTA2- Inputs & Outputs — **Project: PROJECT_STA1E** — Model Release: 9/30/2005 — Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	2010 Base
Input Series Name		TS_2010Base
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-1E with East and West Distribution Cells
Inlfows include all C-51 West Basin and Acme Basin B runoff; L-8 Basin runoff volume through S-5AE bypassed thru S-155A
Cell-to-cell seepage not considered in analysis
East and West Distribution Cells each modeled as two cells in parallel

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	13.3	17.9	10.1
GM Outflow C (ppb)	10.6	15.0	7.6
Load Reduction %	90%	86%	92%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.0%
Warning/Error Messages	11	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	EDCE	1	2	EDCW	3	4N	4S	WDCW	7	WDCE	5	6
Vegetation Type	-->	EMG_3	EMG_3	SAV_3	EMG_3	EMG_3	SAV_3	SAV_3	EMG_3	EMG_3	EMG_3	EMG_3	SAV_3
Inflow Fraction	-	0.2			0.39				0.16		0.25		
Downstream Cell Number	-	2	3		5	6	7		9	12	11.00	12.00	
Surface Area	km2	0.95	2.25	2.23	0.95	2.38	2.61	3.04	1.17	1.69	1.17	2.31	4.25
Mean Width of Flow Path	km	0.66	1.55	1.55	0.66	1.55	1.55	1.55	0.75	1.18	0.75	1.61	1.61
Number of Tanks in Series	-	0.5	3.0	3.0	0.5	3.0	3.0	3.0	0.5	3.0	0.5	3.0	3.0
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	40	60	90	40	60	60	100	40	40	40	60
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4	4	4	4	4	4
Outflow Coefficient - Intercept	-	1	1	1	1	1	1	1	1	1	1	1	1
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm									0.0054			0.0057
Inflow Seepage Control Elev	cm									69			94
Inflow Seepage Conc	ppb									20			20
Outflow Seepage Rate	(cm/d) / cm	0.0095	0.0042	0.0042	0.0095			0.0054	0.01		0.01		
Outflow Seepage Control Elev	cm	-137	-137	-99	-87			-38	-15		-76		
Max Outflow Seepage Conc	ppb	20	20	20	20			20	20		20		
Seepage Recycle to Cell Number	-	1	1	1	4			7	8		10		
Seepage Recycle Fraction	-	1	1	1	1			1					
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30	30	30	30	30	30
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500	500	500	500	500	500
Initial Water Column Depth	cm	50	50	50	50	50	50	50	50	50	50	50	50
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3	3	3	3	3	3
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22	22	22	22	22	22
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300	300	300	300	300	300	300
K = Net Settling Rate at Steady State	m/yr	16.8	16.8	52.5	16.8	16.8	52.5	52.5	16.8	16.8	16.8	16.8	52.5
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40	40	40	40	40	40
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100	100	100	100	100	100
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	10.26	10.71	11.17	11.43	11.89	12.31	12.77	13.06	13.49	13.74	14.20	14.66	14.66
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784
Cell Label		EDCE	1	2	EDCW	3	4N	4S	WDCW	7	WDCE	5	6	Total
Downstream Cell Label		1	2	Outflow	3	4N	4S	Outflow	7	6	5	6	Outflow	-
Network Simulation Name	-	none	none	none	none	none	none	none	none	none	none	none	none	none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta
Surface Area	km2	0.95	2.25	2.23	0.95	2.38	2.61	3.04	1.17	1.69	1.17	2.31	4.25	25.00
Mean Rainfall	cm/yr	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9
Mean ET	cm/yr	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7
Cell Inflow Volume	hm3/yr	42.4	54.5	48.3	82.7	82.8	83.1	83.4	33.9	29.1	53.0	47.3	77.7	211.9
Cell Inflow Load	kg/yr	5407	4381	2415	10543	8930	6531	2437	4325	2680	6758	4848	4375	27034
Cell Inflow Conc	ppb	127.6	80.4	50.0	127.6	107.9	78.6	29.2	127.6	92.0	127.6	102.4	56.3	127.6
Treated Outflow Volume	hm3/yr	54.5	48.3	43.1	82.8	83.1	83.4	83.8	29.1	30.0	47.3	47.6	80.9	207.8
Treated Outflow Load	kg/yr	4381	2415	606	8930	6531	2437	996	2680	1485	4848	2890	1166	2767
Treated FWM Outflow Conc	ppb	80.4	50.0	14.1	107.9	78.6	29.2	11.9	92.0	49.5	102.4	60.7	14.4	13.3
Upper Confidence Limit	ppb	83.6	57.9	18.5	110.6	86.7	37.4	16.0	98.6	60.4	107.5	71.5	19.4	17.9
Lower Confidence Limit	ppb	76.5	41.7	10.7	104.5	69.4	22.1	9.0	84.6	38.9	96.5	49.5	10.8	10.1
Total Outflow Volume + Bypass	hm3/yr	54.5	48.3	43.1	82.8	83.1	83.4	83.8	29.1	30.0	47.3	47.6	80.9	207.8
Total Outflow Load + Bypass	kg/yr	4381	2415	606	8930	6531	2437	996	2680	1485	4848	2890	1166	2767.2
Total FWM Outflow Conc	ppb	80.4	50.0	14.1	107.9	78.6	29.2	11.9	92.0	49.5	102.4	60.7	14.4	13.3
Bypass Load	kg/yr	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Inflow	hm3/d	0.48	0.52	0.52	0.93	0.94	0.96	0.98	0.38	0.38	0.60	0.59	1.00	2.39
Maximum Outflow	hm3/d	0.52	0.52	0.52	0.94	0.96	0.98	1.01	0.38	0.39	0.59	0.61	1.04	2.57
Surface Load Reduction	kg/yr	1026	1966	1809	1614	2399	4094	1441	1646	1195	1910	1958	3210	24267
Load Trapped in Sediments	kg/yr	905	1674	1778	1161	2480	4183	1543	1255	1266	1381	2037	3408	23071
Overall Load Reduction	%	19%	45%	75%	15%	27%	63%	59%	38%	45%	28%	40%	73%	90%
Lower Confidence Limit	%	16%	39%	71%	13%	21%	57%	57%	34%	37%	25%	33%	70%	86%
Upper Confidence Limit	%	23%	52%	77%	18%	33%	68%	59%	43%	53%	32%	48%	75%	92%
Daily Geometric Mean	ppb	74.2	47.2	11.2	101.2	74.4	25.3	9.0	87.0	45.1	97.0	56.4	10.9	#N/A
Outflow Geo Mean - Composites	ppb	75.3	47.7	11.6	102.2	75.1	25.9	9.4	87.8	45.8	97.8	56.9	11.5	10.6
Upper Confidence Limit	ppb	78.2	55.50	16.0	104.9	83.2	33.9	13.5	94.4	56.7	103.0	67.9	16.3	15.0
Lower Confidence Limit	ppb	71.7	39.40	8.4	98.8	65.8	18.9	6.7	80.3	35.3	91.7	45.8	8.2	7.6
Frequency Outflow Conc > 10 ppb	%	100%	100%	72%	100%	100%	100%	44%	100%	100%	100%	100%	69%	58%
Frequency Outflow Conc > 20 ppb	%	100%	100%	1%	100%	100%	87%	0%	100%	100%	100%	100%	3%	12%
Frequency Outflow Conc > 50 ppb	%	100%	33%	0%	100%	100%	0%	0%	100%	28%	100%	86%	0%	1%
Freq Outflow Volume > 10 ppb	%	100%	100%	85%	100%	100%	100%	64%	100%	100%	100%	100%	84%	77%
95th Percentile Outflow Conc	ppb	96	57	18	125	88	37	16	103	57	115	69	19	18
Mean Biomass P Storage	mg/m2	2989	2336	799	3836	3272	1606	509	3396	2352	3705	2769	804	1966
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Net Storage Turnover Rate	1/yr	11.1	11.1	34.9	11.1	11.1	34.9	34.9	11.1	11.1	11.1	11.1	34.9	16.4
Unit Area P Removal	mg/m2-yr	952	744	797	1221	1042	1603	507	1073	749	1180	882	802	923
Mean Water Load	cm/d	12.2	6.6	5.9	23.8	9.5	8.7	7.5	7.9	4.7	12.4	5.6	5.0	2.3
Max Water Load	cm/d	50.3	23.2	23.4	98.0	39.5	36.7	32.3	32.7	22.4	51.1	25.4	23.5	9.6
Mean Depth	cm	67	52	61	92	58	65	65	101	49	60	51	64	63
Minimum Depth	cm	51	40	56	90	40	59	57	90	34	37	35	56	52
Maximum Depth	cm	94	76	76	109	89	89	90	104	76	94	78	89	87
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Flow/Width	m2/day	176	96	85	343	146	147	147	124	68	193	80	132	132.5
HRT Days	days	5.5	7.8	10.3	3.9	6.1	7.4	8.6	12.7	10.5	4.8	9.1	12.8	27.0
Mean Velocity	cm/sec	0.31	0.22	0.16	0.43	0.29	0.26	0.26	0.14	0.16	0.37	0.18	0.24	0.24
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	0%	0%	0%	14%	0%	11%	0%	0%	5%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95th Percentile Outflow Volume	hm3/d	0.31	0.30	0.29	0.53	0.55	0.56	0.57	0.21	0.22	0.33	0.34	0.58	1.4
95th Percentile Outflow Load	kg/d	29.84	16.38	5.23	64.32	44.95	20.07	8.93	21.13	11.88	36.95	22.02	10.74	24.9
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Range Check - Mean Depth	-	-	-	0.99	1.21	-	-	-	1.32	-	-	-	-	3
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Flow/Width	-	-	-	0.53	1.63	-	0.91	0.91	-	-	-	-	0.82	5
Range Check - Inflow Conc	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Outflow Conc	-	-	-	0.95	-	-	-	0.80	-	-	-	-	0.97	3
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Warning or Error Messages														11

Warning or Error Messages:
Cell# 3 2 Depth out of calib. range for SAV_3: 61 vs. 62 - 87 cm
Cell# 3 2 Flow/Width out of calib. range for SAV_3: 85 vs. 162 - 374 m2/day
Cell# 3 2 Outflow Conc out of calib. range for SAV_3: 14 vs. 15 - 153 ppb
Cell# 4 EDCW Depth out of calib. range for EMG_3: 92 vs. 35 - 76 cm
Cell# 4 EDCW Flow/Width out of calib. range for EMG_3: 343 vs. 26 - 210 m2/day
Cell# 6 4N Flow/Width out of calib. range for SAV_3: 147 vs. 162 - 374 m2/day
Cell# 7 4S Flow/Width out of calib. range for SAV_3: 147 vs. 162 - 374 m2/day
Cell# 7 4S Outflow Conc out of calib. range for SAV_3: 12 vs. 15 - 153 ppb
Cell# 8 WDCW Depth out of calib. range for EMG_3: 101 vs. 35 - 76 cm
Cell# 12 6 Flow/Width out of calib. range for SAV_3: 132 vs. 162 - 374 m2/day
Cell# 12 6 Outflow Conc out of calib. range for SAV_3: 14 vs. 15 - 153 ppb

Table A.4 STA-2: Case "2010 Min"

DMSTA2- Inputs & Outputs Project: PROJECT_STA2 Model Release: 9/30/2005
Current Date: 9/30/2005

Input Variable	Units	Value	Case Description:						
Design Case Name	-	2010 Min	STA-2 Without Cell 4						
Input Series Name		TS_2010Ext	Inflow time series includes allowance of 38 cfs (27,500 ac-ft/yr) seepage from WCA-2A to Supply Canal						
Starting Date for Simulation	-	05/01/65	Analysis for WY 1966-2000 for basin runoff only from S-2/S-6 South Sub-Basin (52% of total Basin)						
Ending Date for Simulation	-	04/30/00	Inflows from S-5A Basin and ESWCD/715 Farms excluded						
Starting Date for Output	-	05/01/65							
Integration Steps Per Day	-	4	Simulation Type:	Uncertainty Analysis					
Number of Iterations	-	0	Output Variable	Mean	Lower CL	Upper CL	Diagnostics		
Output Averaging Interval	days	30	FWM Outflow C (ppb)	11.7	14.1	9.9	H20 Balance Error Mean & Max	0.0%	0.0%
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb)	8.5	10.8	6.8	Mass Balance Error Mean & Max	0.1%	0.1%
Rainfall P Conc	ppb	10	Load Reduction %	85%	82%	88%	Iterations & Convergence	2	0.7%
Atmospheric P Load (Dry)	mg/m2-yr	20	Bypass Load (%)	0.0%			Warning/Error Messages	2	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1	2	3									
Vegetation Type	-->	PEW_3	PEW_3	SAV_3									
Inflow Fraction	-	0.23	0.29	0.48									
Downstream Cell Number	-												
Surface Area	km2	7.28	9.19	9.19									
Mean Width of Flow Path	km	1.58	2.00	2.00									
Number of Tanks in Series	-	3.0	3.0	6.0									
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	40	60									
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4									
Outflow Coefficient - Intercept	-	1	1	1									
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm	0.008											
Inflow Seepage Control Elev	cm	76											
Inflow Seepage Conc	ppb	20											
Outflow Seepage Rate	(cm/d) / cm	0.004	0.006	0.01									
Outflow Seepage Control Elev	cm	-61	-61	-30									
Max Outflow Seepage Conc	ppb	20	20	20									
Seepage Recycle to Cell Number	-	1	2	3									
Seepage Recycle Fraction	-	1	1	1									
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30								
Initial P Storage Per Unit Area	mg/m2	500	500	500	500								
Initial Water Column Depth	cm	200	200	200	200								
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3								
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22								
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300								
K = Net Settling Rate at Steady State	m/yr	34.9	34.9	52.5	52.5								
Z1 = Saturated Uptake Depth	cm	40	40	40	40								
Z2 = Lower Penalty Depth	cm	100	100	100	100								
Z3 = Upper Penalty Depth	cm	200	200	200	200								

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	2.46	2.91	3.66										3.66
Run Date	-	09/30/05	09/30/05	09/30/05										09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65										05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65										05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00										04/30/00
Output Duration	days	12784	12784	12784										12784
Cell Label		1	2	3										Total
Downstream Cell Label		Outflow	Outflow	Outflow										-
Network Simulation Name	-	none	none	none										none
Simulation Type	-	Uncerta	Uncerta	Uncerta										Uncerta
Surface Area	km2	7.28	9.19	9.19										25.66
Mean Rainfall	cm/yr	128.6	128.6	128.6										128.6
Mean ET	cm/yr	130.3	130.3	130.3										130.3
Cell Inflow Volume	hm3/yr	42.7	53.9	89.2										185.9
Cell Inflow Load	kg/yr	3508	4423	7320										15251
Cell Inflow Conc	ppb	82.1	82.1	82.1										82.1
Treated Outflow Volume	hm3/yr	48.1	53.7	89.1										190.9
Treated Outflow Load	kg/yr	568	656	1004										2229
Treated FWM Outflow Conc	ppb	11.8	12.2	11.3										11.7
Upper Confidence Limit	ppb	14.6	15.0	13.2										14.1
Lower Confidence Limit	ppb	9.8	10.2	9.8										9.9
Total Outflow Volume + Bypass	hm3/yr	48.1	53.7	89.1										190.9
Total Outflow Load + Bypass	kg/yr	568	656	1004										2228.7
Total FWM Outflow Conc	ppb	11.8	12.2	11.3										11.7
Bypass Load	kg/yr	0	0	0										0.0
Bypass Load	%	0.0	0.0	0.0										0.0
Maximum Inflow	hm3/d	0.52	0.65	1.08										2.25
Maximum Outflow	hm3/d	0.58	0.73	1.17										2.49
Surface Load Reduction	kg/yr	2939	3767	6316										13022
Load Trapped in Sediments	kg/yr	3253	4006	6477										13736
Overall Load Reduction	%	84%	85%	86%										85%
Lower Confidence Limit	%	80%	82%	84%										82%
Upper Confidence Limit	%	87%	88%	88%										88%
Daily Geometric Mean	ppb	8.3	7.9	6.1										#N/A
Outflow Geo Mean - Composites	ppb	9.2	9.1	7.6										8.5
Upper Confidence Limit	ppb	11.9	11.83	9.4										10.8
Lower Confidence Limit	ppb	7.2	7.13	6.2										6.8
Frequency Outflow Conc > 10 ppb	%	35%	36%	30%										33%
Frequency Outflow Conc > 20 ppb	%	0%	0%	0%										9%
Frequency Outflow Conc > 50 ppb	%	0%	0%	0%										0%
Freq Outflow Volume > 10 ppb	%	56%	60%	50%										54%
95th Percentile Outflow Conc	ppb	16	16	16										16
Mean Biomass P Storage	mg/m2	673	657	706										679
Storage Increase / Net Removal	%	0%	0%	0%										0%
Net Storage Turnover Rate	1/yr	23.2	23.2	34.9										27.6
Unit Area P Removal	mg/m2-yr	447	436	705										535
Mean Water Load	cm/d	1.6	1.6	2.7										2.0
Max Water Load	cm/d	7.1	7.1	11.7										8.8
Mean Depth	cm	50	49	64										55
Minimum Depth	cm	40	34	60										45
Maximum Depth	cm	77	77	86										80
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%										0.0%
Flow/Width	m2/day	74	74	122										91.2
HRT Days	days	31.4	30.7	24.2										27.7
Mean Velocity	cm/sec	0.17	0.17	0.22										0.19
Seepage Outflow / Total Outflow	%	0%	0%	0%										0%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0										0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0										0.0
95th Percentile Outflow Volume	hm3/d	0.34	0.42	0.68										1.4
95th Percentile Outflow Load	kg/d	5.08	6.33	10.26										21.7
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A										#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A										#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A										#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A										#N/A
Range Check - Mean Depth	-	-	-	-										0
Range Check - Freq Depth < 10 cm	-	-	-	-										0
Range Check - Flow/Width	-	-	-	0.75										1
Range Check - Inflow Conc	-	-	-	-										0
Range Check - Outflow Conc	-	-	-	0.76										1
Water Balance Error	%	0.00%	0.00%	0.00%										0.00%
Mass Balance Error	%	0.02%	0.02%	0.11%										0.07%
Warning or Error Messages		Cell# 3 3 Flow/Width out of calib. range for SAV_3: 122 vs. 162 - 374 m2/day Cell# 3 3 Outflow Conc out of calib. range for SAV_3: 11 vs. 15 - 153 ppb												2

Table A.5 STA-2: Case “2010 Alt1”

DMSTA2- Inputs & Outputs Project: PROJECT_STA2 Model Release: 9/30/2005
Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	2010 Alt 1
Input Series Name		TS_2010Alt1
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-2 Without Cell 4
Inflow time series includes allowance of 38 cfs (27,500 ac-ft/yr) seepage from WCA-2A to Supply Canal
Analysis for WY 1966-2000 includes all basin runoff from S-2/S-6 South Sub-Basin (52% of total Basin)
Inflows from S-5A Basin, S-2/S-6 North, and ESWCD/715 Farms included after firm diversion of 2,000 cfs to NNRC

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	16.9	20.2	14.5
GM Outflow C (ppb)	11.1	14.3	8.6
Load Reduction %	81%	77%	84%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.1%	0.2%
Iterations & Convergence	2	0.2%
Warning/Error Messages	1	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1	2	3									
Vegetation Type	-->	PEW_3	PEW_3	SAV_3									
Inflow Fraction	-	0.23	0.29	0.48									
Downstream Cell Number	-												
Surface Area	km2	7.28	9.19	9.19									
Mean Width of Flow Path	km	1.58	2.00	2.00									
Number of Tanks in Series	-	3.0	3.0	6.0									
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	40	60									
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4									
Outflow Coefficient - Intercept	-	1	1	1									
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm	0.008											
Inflow Seepage Control Elev	cm	76											
Inflow Seepage Conc	ppb	20											
Outflow Seepage Rate	(cm/d) / cm	0.004	0.006	0.01									
Outflow Seepage Control Elev	cm	-61	-61	-30									
Max Outflow Seepage Conc	ppb	20	20	20									
Seepage Recycle to Cell Number	-	1	2	3									
Seepage Recycle Fraction	-	1	1	1									
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30								
Initial P Storage Per Unit Area	mg/m2	500	500	500	500								
Initial Water Column Depth	cm	200	200	200	200								
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3								
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22								
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300								
K = Net Settling Rate at Steady State	m/yr	34.9	34.9	52.5	52.5								
Z1 = Saturated Uptake Depth	cm	40	40	40	40								
Z2 = Lower Penalty Depth	cm	100	100	100	100								
Z3 = Upper Penalty Depth	cm	200	200	200	200								

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	2.49	2.91	3.66										3.66
Run Date	-	09/30/05	09/30/05	09/30/05										09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65										05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65										05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00										04/30/00
Output Duration	days	12784	12784	12784										12784
Cell Label		1	2	3										Total
Downstream Cell Label		Outflow	Outflow	Outflow										-
Network Simulation Name	-	none	none	none										none
Simulation Type	-	Uncerta	Uncerta	Uncerta										Uncerta
Surface Area	km2	7.28	9.19	9.19										25.66
Mean Rainfall	cm/yr	128.6	128.6	128.6										128.6
Mean ET	cm/yr	130.3	130.3	130.3										130.3
Cell Inflow Volume	hm3/yr	51.3	64.7	107.0										223.0
Cell Inflow Load	kg/yr	4663	5880	9732										20274
Cell Inflow Conc	ppb	90.9	90.9	90.9										90.9
Treated Outflow Volume	hm3/yr	56.5	64.5	106.9										227.9
Treated Outflow Load	kg/yr	944	1117	1801										3862
Treated FWM Outflow Conc	ppb	16.7	17.3	16.9										16.9
Upper Confidence Limit	ppb	20.4	21.0	19.6										20.2
Lower Confidence Limit	ppb	13.9	14.6	14.7										14.5
Total Outflow Volume + Bypass	hm3/yr	56.5	64.5	106.9										227.9
Total Outflow Load + Bypass	kg/yr	944	1117	1801										3862.1
Total FWM Outflow Conc	ppb	16.7	17.3	16.9										16.9
Bypass Load	kg/yr	0	0	0										0.0
Bypass Load	%	0.0	0.0	0.0										0.0
Maximum Inflow	hm3/d	0.75	0.95	1.57										3.27
Maximum Outflow	hm3/d	0.82	1.04	1.67										3.53
Surface Load Reduction	kg/yr	3719	4763	7931										16412
Load Trapped in Sediments	kg/yr	4004	4954	7998										16956
Overall Load Reduction	%	80%	81%	81%										81%
Lower Confidence Limit	%	75%	77%	78%										77%
Upper Confidence Limit	%	83%	84%	84%										84%
Daily Geometric Mean	ppb	10.4	10.0	7.9										#N/A
Outflow Geo Mean - Composites	ppb	11.8	11.7	10.1										11.1
Upper Confidence Limit	ppb	15.4	15.38	12.8										14.3
Lower Confidence Limit	ppb	9.1	9.02	8.1										8.6
Frequency Outflow Conc > 10 ppb	%	60%	58%	44%										52%
Frequency Outflow Conc > 20 ppb	%	12%	13%	12%										25%
Frequency Outflow Conc > 50 ppb	%	0%	0%	0%										12%
Freq Outflow Volume > 10 ppb	%	79%	81%	70%										75%
95th Percentile Outflow Conc	ppb	23	24	25										25
Mean Biomass P Storage	mg/m2	829	812	872										838
Storage Increase / Net Removal	%	0%	0%	0%										0%
Net Storage Turnover Rate	1/yr	23.2	23.2	34.9										27.6
Unit Area P Removal	mg/m2-yr	550	539	870										661
Mean Water Load	cm/d	1.9	1.9	3.2										2.4
Max Water Load	cm/d	10.3	10.3	17.1										12.8
Mean Depth	cm	51	50	65										56
Minimum Depth	cm	40	34	60										45
Maximum Depth	cm	83	83	93										87
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%										0.0%
Flow/Width	m2/day	89	89	147										109.4
HRT Days	days	26.6	26.0	20.4										23.5
Mean Velocity	cm/sec	0.20	0.20	0.26										0.22
Seepage Outflow / Total Outflow	%	0%	0%	0%										0%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0										0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0										0.0
95th Percentile Outflow Volume	hm3/d	0.44	0.55	0.91										1.9
95th Percentile Outflow Load	kg/d	9.99	12.45	20.42										43.4
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A										#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A										#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A										#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A										#N/A
Range Check - Mean Depth	-	-	-	-										0
Range Check - Freq Depth < 10 cm	-	-	-	-										0
Range Check - Flow/Width	-	-	-	0.91										1
Range Check - Inflow Conc	-	-	-	-										0
Range Check - Outflow Conc	-	-	-	-										0
Water Balance Error	%	0.00%	0.00%	0.00%										0.00%
Mass Balance Error	%	0.03%	0.03%	0.23%										0.13%
Warning or Error Messages		Cell# 3 3 Flow/Width out of calib. range for SAV_3: 147 vs. 162 - 374 m2/day												1

Table A.6 Compartment B: Case "2010_Alt1"

DMSTA2- Inputs & Outputs | **Project: PROJECT_COMPB** | Model Release: 9/30/2005 | Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	2010 Alt 1
Input Series Name		TS_2010Alt1
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
Compartment B Buildout; includes Cell 4
Inflow pumping capacity limited to 1,600 cfs; modeled as four cells in series
Alternative 1 analysis; inflows include all NNRC inflows (after A-1 Reservoir diversion) up to capacity of inflow pump station
Excess NNRC inflows considered sent to STA-3/4 through G-370; diversion from Hillsboro at firm capacity of 2,000 cfs

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	16.5	21.8	12.6
GM Outflow C (ppb)	13.4	18.6	9.8
Load Reduction %	87%	82%	90%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.0%
Warning/Error Messages	2	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	North	Cell 4	South 1	South 2								
Vegetation Type	-->	EMG_3	SAV_3	SAV_3	SAV_3								
Inflow Fraction	-	1											
Downstream Cell Number	-	2	3	4									
Surface Area	km2	17.32	7.70	5.59	5.59								
Mean Width of Flow Path	km	6.11	2.50	2.60	4.07								
Number of Tanks in Series	-	3.0	3.0	3.0	3.0								
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	60	60	60	60								
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4								
Outflow Coefficient - Intercept	-	1	1	1	1								
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm	0.002	0.004	0.0055	0.002								
Inflow Seepage Control Elev	cm	67	67	67	67								
Inflow Seepage Conc	ppb	20	20	20	15								
Outflow Seepage Rate	(cm/d) / cm	0.0037											
Outflow Seepage Control Elev	cm	12											
Max Outflow Seepage Conc	ppb	20											
Seepage Recycle to Cell Number	-	1											
Seepage Recycle Fraction	-	0.78											
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30								
Initial P Storage Per Unit Area	mg/m2	500	500	500	500								
Initial Water Column Depth	cm	200	200	200	200								
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3								
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22								
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300								
K = Net Settling Rate at Steady State	m/yr	16.8	52.5	52.5	52.5								
Z1 = Saturated Uptake Depth	cm	40	40	40	40								
Z2 = Lower Penalty Depth	cm	100	100	100	100								
Z3 = Upper Penalty Depth	cm	200	200	200	200								

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	4.40	4.83	5.29	5.71									5.71
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05									09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65									05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65									05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00									04/30/00
Output Duration	days	12784	12784	12784	12784									12784
Cell Label		North	Cell 4	South 1	South 2									Total
Downstream Cell Label		Cell 4	South 1	South 2	Outflow									-
Network Simulation Name	-	none	none	none	none									none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta									Uncerta
Surface Area	km2	17.32	7.70	5.59	5.59									36.19
Mean Rainfall	cm/yr	128.6	128.6	128.6	128.6									128.6
Mean ET	cm/yr	130.3	130.3	130.3	130.3									130.3
Cell Inflow Volume	hm3/yr	359.1	356.9	357.4	357.9									359.1
Cell Inflow Load	kg/yr	44065	26423	13609	8644									44065
Cell Inflow Conc	ppb	122.7	74.0	38.1	24.2									122.7
Treated Outflow Volume	hm3/yr	356.9	357.4	357.9	358.0									358.0
Treated Outflow Load	kg/yr	26423	13609	8644	5891									5891
Treated FWM Outflow Conc	ppb	74.0	38.1	24.2	16.5									16.5
Upper Confidence Limit	ppb	82.3	46.9	31.4	21.8									21.8
Lower Confidence Limit	ppb	64.9	30.0	18.4	12.6									12.6
Total Outflow Volume + Bypass	hm3/yr	356.9	357.4	357.9	358.0									358.0
Total Outflow Load + Bypass	kg/yr	26423	13609	8644	5891									5890.9
Total FWM Outflow Conc	ppb	74.0	38.1	24.2	16.5									16.5
Bypass Load	kg/yr	0	0	0	0									0.0
Bypass Load	%	0.0	0.0	0.0	0.0									0.0
Maximum Inflow	hm3/d	3.65	3.78	3.84	3.89									3.65
Maximum Outflow	hm3/d	3.78	3.84	3.89	3.93									3.93
Surface Load Reduction	kg/yr	17642	12815	4964	2754									38174
Load Trapped in Sediments	kg/yr	17405	13075	5155	2937									38572
Overall Load Reduction	%	40%	48%	36%	32%									87%
Lower Confidence Limit	%	33%	43%	33%	30%									82%
Upper Confidence Limit	%	47%	54%	39%	31%									90%
Daily Geometric Mean	ppb	66.4	30.2	17.6	10.9									#N/A
Outflow Geo Mean - Composites	ppb	71.0	34.1	20.7	13.4									13.4
Upper Confidence Limit	ppb	79.5	42.86	27.7	18.6									18.6
Lower Confidence Limit	ppb	61.8	26.26	15.1	9.8									9.8
Frequency Outflow Conc > 10 ppb	%	100%	100%	99%	83%									83%
Frequency Outflow Conc > 20 ppb	%	100%	98%	59%	8%									42%
Frequency Outflow Conc > 50 ppb	%	100%	1%	0%	0%									8%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	92%									92%
95th Percentile Outflow Conc	ppb	82	48	31	21									21
Mean Biomass P Storage	mg/m2	3155	1703	926	526									2096
Storage Increase / Net Removal	%	0%	0%	0%	0%									0%
Net Storage Turnover Rate	1/yr	11.1	34.9	34.9	35.0									17.8
Unit Area P Removal	mg/m2-yr	1005	1698	923	526									1066
Mean Water Load	cm/d	5.7	12.7	17.5	17.5									2.7
Max Water Load	cm/d	21.1	49.1	68.8	69.6									10.1
Mean Depth	cm	65	73	73	68									68
Minimum Depth	cm	40	42	44	40									41
Maximum Depth	cm	88	111	110	99									98
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%									0.0%
Flow/Width	m2/day	161	391	376	241									255.5
HRT Days	days	11.4	5.8	4.2	3.9									25.1
Mean Velocity	cm/sec	0.29	0.62	0.60	0.41									0.43
Seepage Outflow / Total Outflow	%	1%	0%	0%	0%									1%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0									0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0									0.0
95th Percentile Outflow Volume	hm3/d	2.64	2.67	2.72	2.75									2.7
95th Percentile Outflow Load	kg/d	200.65	111.30	72.93	51.18									51.2
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A									#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A									#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A									#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A									#N/A
Range Check - Mean Depth	-	-	-	-	-									0
Range Check - Freq Depth < 10 cm	-	-	-	-	-									0
Range Check - Flow/Width	-	-	1.05	1.01	-									2
Range Check - Inflow Conc	-	-	-	-	-									0
Range Check - Outflow Conc	-	-	-	-	-									0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%									0.00%
Mass Balance Error	%	0.02%	0.02%	0.03%	0.05%									0.05%
Warning or Error Messages		Cell# 2 Cell 4 Flow/Width out of calib. range for SAV_3: 391 vs. 162 - 374 m2/day Cell# 3 South 1 Flow/Width out of calib. range for SAV_3: 376 vs. 162 - 374 m2/day												2

Table A.7 EAASR A-1: Case “A1_2010”

DMSTA2- Inputs & Outputs — Project: PROJECT_A1RES_NETWORK — Model Release: 9/30/2005 — Current Date: 10/1/2005

Input Variable	Units	Value
Design Case Name	-	A1_2010
Input Series Name		TS_RES_2010
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
A-1 Reservoir, 2010 Inflows (Alternative 1)
16,000-acre net surface area
Inflow volumes, outflow volumes, and depths from SFWMM simulation
Tested series compare DMSTA simulation with independent sfwmm simulation

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	80.5	85.8	73.4
GM Outflow C (ppb)	79.8	86.3	71.3
Load Reduction %	23%	17%	30%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	2	0.3%
Warning/Error Messages	0	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	A-1											
Vegetation Type	-->	RES_3											
Inflow Fraction	-	1											
Downstream Cell Number	-												
Surface Area	km2	39.54											
Mean Width of Flow Pa	km	6.49											
Number of Tanks in Series	-	1.0											
Minimum Depth for Releases	cm												
Release 1 Series Name		WSUPPLY											
Release 2 Series Name													
Outflow Series Name		*TO_STA											
Depth Series Name		DEPTH											
Outflow Control Depth	cm												
Outflow Weir Depth	cm	10											
Outflow Coefficient - Exponent	-												
Outflow Coefficient - Intercept	-												
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.002											
Outflow Seepage Control Elev	cm												
Max Outflow Seepage Conc	ppb	20											
Seepage Recycle to Cell Number	-												
Seepage Recycle Fraction	-												
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30											
Initial P Storage Per Unit Area	mg/m2	500											
Initial Water Column Depth	cm	10											
C0 = Conc at 0 g/m2 P Storage	ppb	3		4									
C1 = Conc at 1 g/m2 P storage	ppb	150		100									
C2 = Conc at Half-Max Uptake	ppb												
K = Net Settling Rate at Steady State	m/yr	5.0		2.0									
Z1 = Saturated Uptake Depth	cm	40											
Z2 = Lower Penalty Depth	cm	100											
Z3 = Upper Penalty Depth	cm	400											

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	0.86												0.86
Run Date	-	10/01/05												10/01/05
Starting Date for Simulation	-	05/01/65												05/01/65
Starting Date for Output	-	05/01/65												05/01/65
Ending Date	-	04/30/00												04/30/00
Output Duration	days	12784												12784
Cell Label		A-1												Total
Downstream Cell Label		Outflow												-
Network Simulation Name	-	none												none
Simulation Type	-	Uncerta												Uncerta
Surface Area	km2	39.54												39.54
Mean Rainfall	cm/yr	130.0												130.0
Mean ET	cm/yr	122.3												122.3
Cell Inflow Volume	hm3/yr	514.2												514.2
Cell Inflow Load	kg/yr	49953												49953
Cell Inflow Conc	ppb	97.1												97.1
Treated Outflow Volume	hm3/yr	290.0												290.0
Treated Outflow Load	kg/yr	23332												23332
Treated FWM Outflow Conc	ppb	80.5												80.5
Upper Confidence Limit	ppb	85.8												85.8
Lower Confidence Limit	ppb	73.4												73.4
Total Outflow Volume + Bypass	hm3/yr	469.7												469.7
Total Outflow Load + Bypass	kg/yr	38681												38681.2
Total FWM Outflow Conc	ppb	82.4												82.4
Bypass Load	kg/yr	0												0.0
Bypass Load	%	0.0												0.0
Maximum Inflow	hm3/d	6.87												6.87
Maximum Outflow	hm3/d	5.81												5.81
Surface Load Reduction	kg/yr	26621												26621
Load Trapped in Sediments	kg/yr	9055												9055
Overall Load Reduction	%	23%												23%
Lower Confidence Limit	%	17%												17%
Upper Confidence Limit	%	30%												30%
Daily Geometric Mean	ppb	75.7												#N/A
Outflow Geo Mean - Composites	ppb	79.8												79.8
Upper Confidence Limit	ppb	86.3												86.3
Lower Confidence Limit	ppb	71.3												71.3
Frequency Outflow Conc > 10 ppb	%	100%												100%
Frequency Outflow Conc > 20 ppb	%	100%												100%
Frequency Outflow Conc > 50 ppb	%	100%												100%
Freq Outflow Volume > 10 ppb	%	62%												62%
95th Percentile Outflow Conc	ppb	123												123
Mean Biomass P Storage	mg/m2	421												421
Storage Increase / Net Removal	%	0%												0%
Net Storage Turnover Rate	1/yr	19.0												19.0
Unit Area P Removal	mg/m2-yr	229												229
Mean Water Load	cm/d	3.6												3.6
Max Water Load	cm/d	17.4												17.4
Mean Depth	cm	165												165
Minimum Depth	cm	1												1
Maximum Depth	cm	372												372
Frequency Depth < 10 cm	%	10.5%												10.5%
Flow/Width	m2/day	217												217.0
HRT Days	days	46.3												46.3
Mean Velocity	cm/sec	0.15												0.15
Seepage Outflow / Total Outflow	%	9%												14%
Release 1 Outflow Volume	hm3/yr	179.7												179.7
Release 2 Outflow Volume	hm3/yr	0.0												0.0
95th Percentile Outflow Volume	hm3/d	3.26												3.3
95th Percentile Outflow Load	kg/d	253.01												253.0
Simulated / Specified Mean Depth	%	0.85												0.8
Release 1 Demand Met	%	81%												0.8
Release 2 Demand Met	%	#N/A												#N/A
Outflow Demand Met	%	101%												1.0
Range Check - Mean Depth	-	-												0
Range Check - Freq Depth < 10 cm	-	-												0
Range Check - Flow/Width	-	-												0
Range Check - Inflow Conc	-	-												0
Range Check - Outflow Conc	-	-												0
Water Balance Error	%	0.00%												0.00%
Mass Balance Error	%	0.04%												0.04%
Warning or Error Messages														0

Table A.8 STA-3/4: Case "STA34_Alt1"

DMSTA2- Inputs & Outputs — **Project: PROJECT_A1RES_NETWORK** — Model Release: 9/30/2005 — Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	STA34_ALT1
Input Series Name		TS_34_2010
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-3/4, 2010-2014, Alternative 1
Receives inflows from EAASR Compartment A-1; STA enhanced per LTP (including SAV in Cell 1B)
Also receives direct inflows from NNRC at G-370 and Miami Canal at G-372
Water supply releases to LEC and Big Cypress Reservation excluded from treatment area inflows

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	18.6	#N/A	#N/A
GM Outflow C (ppb)	14.6	#N/A	#N/A
Load Reduction %	80%	#N/A	#N/A
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.1%	0.1%
Iterations & Convergence	3	0.0%
Warning/Error Messages	4	

Cell Number -->	Units	1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	2A	2B	3A	3B						
Vegetation Type	-->	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3						
Inflow Fraction	-	0.4		0.33		0.27							
Downstream Cell Number	-	2		4		6							
Surface Area	km2	12.30	14.12	10.29	11.71	9.61	8.92						
Mean Width of Flow Path	km	3.42	4.50	2.89	4.02	4.88	4.88						
Number of Tanks in Series	-	6.0	3.0	6.0	3.0	4.0	4.0						
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	60	60	60	60	60	60						
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4						
Outflow Coefficient - Intercept	-	1	1	1	1	1	1						
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0058	0.0029	0.0014		0.0038							
Outflow Seepage Control Elev	cm	16	40	-67		-64							
Max Outflow Seepage Conc	ppb	20	20	20		20							
Seepage Recycle to Cell Number	-	1	1	3		3							
Seepage Recycle Fraction	-	0.5	0.5	0.5		0.5							
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30						
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500						
Initial Water Column Depth	cm	200	200	200	200	200	200						
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3						
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22						
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300						
K = Net Settling Rate at Steady State	m/yr	16.8	52.5	16.8	52.5	16.8	52.5						
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40						
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100						
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200						

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	8.20	8.63	9.37	9.83	10.37	10.91							10.91
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05							09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00							04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784							12784
Cell Label		1A	1B	2A	2B	3A	3B							Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow							-
Network Simulation Name	-	A1_STA34	A1_STA34	A1_STA34	A1_STA34	A1_STA34	A1_STA34							A1_STA34
Simulation Type	-	Base	Base	Base	Base	Base	Base							Base
Surface Area	km2	12.30	14.12	10.29	11.71	9.61	8.92							66.94
Mean Rainfall	cm/yr	130.0	130.0	130.0	130.0	130.0	130.0							130.0
Mean ET	cm/yr	134.9	134.9	134.9	134.9	134.8	134.9							134.9
Cell Inflow Volume	hm3/yr	289.0	283.5	238.4	242.4	195.1	178.5							722.5
Cell Inflow Load	kg/yr	26344	16242	21734	13729	17782	9781							65860
Cell Inflow Conc	ppb	91.2	57.3	91.2	56.6	91.2	54.8							91.2
Treated Outflow Volume	hm3/yr	283.5	279.3	242.4	241.9	178.5	178.0							699.2
Treated Outflow Load	kg/yr	16242	5217	13729	4513	9781	3261							12991
Treated FWM Outflow Conc	ppb	57.3	18.7	56.6	18.7	54.8	18.3							18.6
Upper Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Lower Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Total Outflow Volume + Bypass	hm3/yr	283.5	279.3	242.4	241.9	178.5	178.0							699.2
Total Outflow Load + Bypass	kg/yr	16242	5217	13729	4513	9781	3261							12990.8
Total FWM Outflow Conc	ppb	57.3	18.7	56.6	18.7	54.8	18.3							18.6
Bypass Load	kg/yr	0	0	0	0	0	0							0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0							0.0
Maximum Inflow	hm3/d	3.02	2.98	2.49	2.49	2.04	2.01							7.55
Maximum Outflow	hm3/d	2.98	2.99	2.49	2.52	2.01	2.04							7.54
Surface Load Reduction	kg/yr	10102	11025	8005	9217	8001	6520							52869
Load Trapped in Sediments	kg/yr	9806	11405	8117	9600	7247	6808							52983
Overall Load Reduction	%	38%	68%	37%	67%	45%	67%							80%
Lower Confidence Limit	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Upper Confidence Limit	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Daily Geometric Mean	ppb	48.4	11.2	48.1	11.4	48.0	10.0							#N/A
Outflow Geo Mean - Composites	ppb	51.4	15.0	51.0	14.8	51.4	14.7							14.6
Upper Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Lower Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Frequency Outflow Conc > 10 ppb	%	100%	85%	100%	83%	100%	85%							82%
Frequency Outflow Conc > 20 ppb	%	100%	23%	100%	23%	100%	21%							57%
Frequency Outflow Conc > 50 ppb	%	64%	0%	63%	0%	63%	0%							21%
Freq Outflow Volume > 10 ppb	%	100%	93%	100%	93%	100%	92%							93%
95th Percentile Outflow Conc	ppb	64	23	64	23	63	23							23
Mean Biomass P Storage	mg/m2	2504	809	2477	821	2368	765							1597
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%							0%
Net Storage Turnover Rate	1/yr	11.1	34.9	11.1	34.9	11.1	34.9							17.3
Unit Area P Removal	mg/m2-yr	797	808	789	820	754	763							791
Mean Water Load	cm/d	6.4	5.5	6.3	5.7	5.6	5.5							3.0
Max Water Load	cm/d	24.6	21.1	24.2	21.3	21.2	22.6							11.3
Mean Depth	cm	67	63	68	64	57	60							64
Minimum Depth	cm	37	28	50	32	5	29							31
Maximum Depth	cm	94	89	93	87	78	79							87
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%							0.0%
Flow/Width	m2/day	231	173	226	165	109	100							171.5
HRT Days	days	10.4	11.5	10.8	11.3	10.3	10.9							21.5
Mean Velocity	cm/sec	0.40	0.31	0.38	0.30	0.22	0.19							0.31
Seepage Outflow / Total Outflow	%	2%	1%	1%	0%	4%	0%							3%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
95th Percentile Outflow Volume	hm3/d	2.14	2.19	1.80	1.85	1.43	1.44							5.5
95th Percentile Outflow Load	kg/d	132.23	48.24	109.86	40.88	83.91	30.89							119.6
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Range Check - Mean Depth	-	-	-	-	-	-	0.96							1
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-							0
Range Check - Flow/Width	-	1.10	-	1.08	-	-	0.62							3
Range Check - Inflow Conc	-	-	-	-	-	-	-							0
Range Check - Outflow Conc	-	-	-	-	-	-	-							0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.00%
Mass Balance Error	%	0.10%	0.02%	0.11%	0.02%	0.04%	0.07%							0.10%
Warning or Error Messages														4

Warning or Error Messages:
Cell# 1 1A Flow/Width out of calib. range for EMG_3: 231 vs. 26 - 210 m2/day
Cell# 3 2A Flow/Width out of calib. range for EMG_3: 226 vs. 26 - 210 m2/day
Cell# 6 3B Depth out of calib. range for SAV_3: 60 vs. 62 - 87 cm
Cell# 6 3B Flow/Width out of calib. range for SAV_3: 100 vs. 162 - 374 m2/day

Table A.9 STA-5: Case "2010 Base"

DMSTA2- Inputs & Outputs — Project: PROJECT_STA5 — Model Release: 7/1/2005 — Current Date: 09/29/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2010 Base	STA-5 Expanded to Include Full Build-out of Compartment C
Input Series Name		TS_Base	2010-2014; downstream cells considered as SAV_3; Inflows limited to C-139 Basin runoff
Starting Date for Simulation	-	05/01/94	Historic Inflow Concentrations Reduced by 10% for ongoing BMP implementation in basin
Ending Date for Simulation	-	04/30/05	STA-6 Section 2 converted to use as Cell 6B
Starting Date for Output	-	05/01/94	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	
Output Averaging Interval	days	30	
Inflow Conc Scale Factor	-	1	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	9.6	11.7	8.2
GM Outflow C (ppb)	5.8	7.8	4.7
Load Reduction %	95%	94%	96%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.1%
Warning/Error Messages	18	

Cell Number -->	Units	1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B
Vegetation Type	-->	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3
Inflow Fraction	-	0.156		0.156		0.156		0.156		0.235		0.141	
Downstream Cell Number	-	2		4		6		8		10		12.00	
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71	4.61	3.71	6.92	5.56	2.22	5.26
Mean Width of Flow Path	km	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	2.34	2.34	2.50	2.39
Number of Tanks in Series	-	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	60	40	60	40	60	40	60	40	60	60	60
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4	4	4	4	4	4
Outflow Coefficient - Intercept	-	1	1	1	1	1	1	1	1	1	1	1	1
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0075	0.0075										
Outflow Seepage Control Elev	cm	-46	-38										
Max Outflow Seepage Conc	ppb	20	20										
Seepage Recycle to Cell Number	-	1	2										
Seepage Recycle Fraction	-	1	1										
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30	30	30	30	30	30
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500	500	500	500	500	500
Initial Water Column Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3	3	3	3	3	3
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22	22	22	22	22	22
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300	300	300	300	300	300	300
K = Net Settling Rate at Steady State	m/yr	16.8	52.5	16.8	52.5	16.8	52.5	16.8	52.5	16.8	52.5	16.8	52.5
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40	40	40	40	40	40
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100	100	100	100	100	100
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	16.54	17.18	17.73	18.27	18.82	19.36	19.91	20.54	21.09	21.64	22.18	22.73	22.73
Run Date	-	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05
Starting Date for Simulation	-	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94
Starting Date for Output	-	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94
Ending Date	-	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05
Output Duration	days	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018
Cell Label		1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow	4B	Outflow	5B	Outflow	6B	Outflow	-
Network Simulation Name	-	none	none	none	none	none	none	none	none	none	none	none	none	none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71	4.61	3.71	6.92	5.56	2.22	5.26	53.23
Mean Rainfall	cm/yr	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1
Mean ET	cm/yr	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
Cell Inflow Volume	hm3/yr	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	46.1	46.1	27.7	27.7	196.3
Cell Inflow Load	kg/yr	6106	2144	6106	2336	6106	1713	6106	1713	9199	2590	5519	2719	39143
Cell Inflow Conc	ppb	199.4	70.0	199.4	76.3	199.4	55.9	199.4	55.9	199.4	56.1	199.4	98.2	199.4
Treated Outflow Volume	hm3/yr	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	46.1	46.1	27.7	27.7	196.4
Treated Outflow Load	kg/yr	2144	280	2336	287	1713	302	1713	302	2590	457	2719	260	1888
Treated FWM Outflow Conc	ppb	70.0	9.2	76.3	9.4	55.9	9.9	55.9	9.9	56.1	9.9	98.2	9.4	9.6
Upper Confidence Limit	ppb	84.3	10.9	94.0	11.3	72.5	12.2	72.5	12.2	72.8	12.3	115.1	11.1	11.7
Lower Confidence Limit	ppb	56.0	8.0	59.4	8.1	41.6	8.4	41.6	8.4	41.8	8.4	80.7	8.2	8.2
Total Outflow Volume + Bypass	hm3/yr	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	46.1	46.1	27.7	27.7	196.4
Total Outflow Load + Bypass	kg/yr	2144	280	2336	287	1713	302	1713	302	2590	457	2719	260	1888.1
Total FWM Outflow Conc	ppb	70.0	9.2	76.3	9.4	55.9	9.9	55.9	9.9	56.1	9.9	98.2	9.4	9.6
Bypass Load	kg/yr	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Inflow	hm3/d	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.59	0.58	0.35	0.35	2.50
Maximum Outflow	hm3/d	0.39	0.40	0.39	0.40	0.39	0.40	0.39	0.40	0.58	0.61	0.35	0.35	2.56
Surface Load Reduction	kg/yr	3962	1864	3771	2049	4393	1411	4393	1411	6608	2133	2800	2459	37255
Load Trapped in Sediments	kg/yr	3482	1991	3866	2188	4523	1515	4523	1515	6804	2290	2862	2607	38168
Overall Load Reduction	%	65%	87%	62%	88%	72%	82%	72%	82%	72%	82%	51%	90%	95%
Lower Confidence Limit	%	58%	87%	53%	88%	64%	83%	64%	83%	63%	83%	42%	90%	94%
Upper Confidence Limit	%	72%	86%	70%	86%	79%	80%	79%	80%	79%	80%	60%	90%	96%
Daily Geometric Mean	ppb	62.0	4.8	67.5	4.6	49.2	4.9	49.2	4.9	49.4	4.9	85.0	4.5	#N/A
Outflow Geo Mean - Composites	ppb	62.5	5.8	68.1	5.6	49.8	6.0	49.8	6.0	50.0	6.0	87.7	5.6	5.8
Upper Confidence Limit	ppb	76.1	7.42	85.0	7.3	65.9	8.1	65.9	8.1	66.1	8.2	103.7	7.1	7.8
Lower Confidence Limit	ppb	49.2	4.74	52.0	4.6	36.0	4.7	36.0	4.7	36.1	4.8	71.0	4.6	4.7
Frequency Outflow Conc > 10 ppb	%	100%	14%	100%	14%	100%	15%	100%	15%	100%	15%	100%	15%	15%
Frequency Outflow Conc > 20 ppb	%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	3%
Frequency Outflow Conc > 50 ppb	%	84%	0%	95%	0%	55%	0%	55%	0%	55%	0%	100%	0%	0%
Freq Outflow Volume > 10 ppb	%	100%	34%	100%	37%	100%	42%	100%	42%	100%	42%	100%	37%	39%
95th Percentile Outflow Conc	ppb	86	13	93	14	64	14	64	14	65	14	126	13	14
Mean Biomass P Storage	mg/m2	3235	404	3592	444	3081	409	3081	409	3087	413	4048	497	1765
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Net Storage Turnover Rate	1/yr	3.5	11.0	3.5	11.0	3.5	11.0	3.5	11.0	3.5	11.0	3.5	11.0	4.5
Unit Area P Removal	g/m2-yr	1030	403	1144	443	981	408	981	408	983	412	1289	496	717
Mean Water Load	cm/d	2.5	1.7	2.5	1.7	1.8	2.3	1.8	2.3	1.8	2.3	3.4	1.4	1.0
Max Water Load	cm/d	11.5	7.9	11.5	7.9	8.5	10.5	8.5	10.5	8.5	10.5	15.9	6.7	4.7
Mean Depth	cm	46	59	46	59	46	58	46	58	46	58	60	58	53
Minimum Depth	cm	27	38	27	38	26	37	26	37	26	37	46	40	33
Maximum Depth	cm	70	71	70	71	70	71	70	71	70	71	62	63	70
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Flow/Width	m2/day	54	54	54	54	54	54	54	54	54	54	30	32	50.6
HRT Days	days	18.7	34.5	18.7	34.5	25.4	25.9	25.4	25.9	25.3	25.7	17.5	40.3	52.8
Mean Velocity	cm/sec	0.13	0.11	0.13	0.11	0.13	0.11	0.13	0.11	0.14	0.11	0.06	0.06	0.11
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95th Percentile Outflow Volume	hm3/d	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.41	0.41	0.25	0.26	1.7
95th Percentile Outflow Load	kg/d	21.91	3.37	23.78	3.51	17.05	3.68	17.05	3.68	25.78	5.56	28.39	3.08	22.8
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Range Check - Mean Depth	-	-	0.95	-	0.94	-	0.94	-	0.94	-	0.94	-	0.94	6
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Flow/Width	-	-	0.33	-	0.33	-	0.33	-	0.33	-	0.33	-	0.20	6
Range Check - Inflow Conc	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Outflow Conc	-	-	0.62	-	0.63	-	0.66	-	0.66	-	0.67	-	0.63	6
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%
Warning or Error Messages														18

Warning or Error Messages:

Cell# 2 1B Depth out of calib. range for SAV_3: 59 vs. 62 - 87 cm
Cell# 2 1B Flow/Width out of calib. range for SAV_3: 54 vs. 162 - 374 m2/day
Cell# 2 1B Outflow Conc out of calib. range for SAV_3: 9 vs. 15 - 153 ppb
Cell# 4 2B Depth out of calib. range for SAV_3: 59 vs. 62 - 87 cm
Cell# 4 2B Flow/Width out of calib. range for SAV_3: 54 vs. 162 - 374 m2/day
Cell# 4 2B Outflow Conc out of calib. range for SAV_3: 9 vs. 15 - 153 ppb
Cell# 6 3B Depth out of calib. range for SAV_3: 58 vs. 62 - 87 cm
Cell# 6 3B Flow/Width out of calib. range for SAV_3: 54 vs. 162 - 374 m2/day
Cell# 6 3B Outflow Conc out of calib. range for SAV_3: 10 vs. 15 - 153 ppb
Cell# 8 4B Depth out of calib. range for SAV_3: 58 vs. 62 - 87 cm
Cell# 8 4B Flow/Width out of calib. range for SAV_3: 54 vs. 162 - 374 m2/day
Cell# 8 4B Outflow Conc out of calib. range for SAV_3: 10 vs. 15 - 153 ppb
Cell# 10 5B Depth out of calib. range for SAV_3: 58 vs. 62 - 87 cm
Cell# 10 5B Flow/Width out of calib. range for SAV_3: 54 vs. 162 - 374 m2/day
Cell# 10 5B Outflow Conc out of calib. range for SAV_3: 10 vs. 15 - 153 ppb
Cell# 12 6B Depth out of calib. range for SAV_3: 58 vs. 62 - 87 cm
Cell# 12 6B Flow/Width out of calib. range for SAV_3: 32 vs. 162 - 374 m2/day
Cell# 12 6B Outflow Conc out of calib. range for SAV_3: 9 vs. 15 - 153 ppb

Table A.10: STA-5: Case "2010 Base Emg"

DMSTA2- Inputs & Outputs — **Project: PROJECT_STA5** — Model Release: 7/1/2005 — Current Date: 09/29/05

Input Variable	Units	Value
Design Case Name	-	2010 Base Em
Input Series Name		TS_Base
Starting Date for Simulation	-	05/01/94
Ending Date for Simulation	-	04/30/05
Starting Date for Output	-	05/01/94
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-5 Expanded to Include Full Build-out of Compartment C
2010-2014; downstream cells considered as EMG_3; Inflows limited to C-139 Basin runoff
Historic Inflow Concentrations Reduced by 10% for ongoing BMP implementation in basin
STA-6 Section 2 converted to use as Cell 6B

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	21.0	30.7	14.7
GM Outflow C (ppb)	17.1	26.5	11.0
Load Reduction %	89%	85%	93%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.3%
Warning/Error Messages	0	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B
Vegetation Type	-->	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3
Inflow Fraction	-	0.156		0.156		0.156		0.156		0.235		0.141	
Downstream Cell Number	-	2		4		6		8		10		12.00	
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71	4.61	3.71	6.92	5.56	2.22	5.26
Mean Width of Flow Path	km	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	2.34	2.34	2.50	2.39
Number of Tanks in Series	-	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	60	40	60	40	60	40	60	40	60	60	60
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4	4	4	4	4	4
Outflow Coefficient - Intercept	-	1	1	1	1	1	1	1	1	1	1	1	1
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0075	0.0075										
Outflow Seepage Control Elev	cm	-46	-38										
Max Outflow Seepage Conc	ppb	20	20										
Seepage Recycle to Cell Number	-	1	2										
Seepage Recycle Fraction	-	1	1										
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30	30	30	30	30	30
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500	500	500	500	500	500
Initial Water Column Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3	3	3	3	3	3
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22	22	22	22	22	22
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300	300	300	300	300	300	300
K = Net Settling Rate at Steady State	m/yr	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40	40	40	40	40	40
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100	100	100	100	100	100
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	16.73	17.27	17.82	18.36	19.00	19.54	20.09	20.64	21.18	21.73	22.36	22.91	22.91
Run Date	-	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05	09/29/05
Starting Date for Simulation	-	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94
Starting Date for Output	-	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94	05/01/94
Ending Date	-	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05	04/30/05
Output Duration	days	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018	4018
Cell Label		1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow	4B	Outflow	5B	Outflow	6B	Outflow	-
Network Simulation Name	-	none	none	none	none	none	none	none	none	none	none	none	none	none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71	4.61	3.71	6.92	5.56	2.22	5.26	53.23
Mean Rainfall	cm/yr	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1	82.1
Mean ET	cm/yr	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
Cell Inflow Volume	hm3/yr	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	46.1	46.1	27.7	27.7	196.3
Cell Inflow Load	kg/yr	6106	2144	6106	2336	6106	1713	6106	1713	9199	2590	5519	2719	39143
Cell Inflow Conc	ppb	199.4	70.0	199.4	76.3	199.4	55.9	199.4	55.9	199.4	56.1	199.4	98.2	199.4
Treated Outflow Volume	hm3/yr	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	46.1	46.1	27.7	27.7	196.4
Treated Outflow Load	kg/yr	2144	615	2336	651	1713	637	1713	637	2590	966	2719	623	4129
Treated FWM Outflow Conc	ppb	70.0	20.1	76.3	21.2	55.9	20.8	55.9	20.8	56.1	20.9	98.2	22.5	21.0
Upper Confidence Limit	ppb	84.3	27.8	94.0	31.3	72.5	30.8	72.5	30.8	72.8	31.0	115.1	32.7	30.7
Lower Confidence Limit	ppb	56.0	14.5	59.4	14.8	41.6	14.5	41.6	14.5	41.8	14.6	80.7	15.7	14.7
Total Outflow Volume + Bypass	hm3/yr	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	46.1	46.1	27.7	27.7	196.4
Total Outflow Load + Bypass	kg/yr	2144	615	2336	651	1713	637	1713	637	2590	966	2719	623	4129.2
Total FWM Outflow Conc	ppb	70.0	20.1	76.3	21.2	55.9	20.8	55.9	20.8	56.1	20.9	98.2	22.5	21.0
Bypass Load	kg/yr	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Inflow	hm3/d	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.59	0.58	0.35	0.35	2.50
Maximum Outflow	hm3/d	0.39	0.40	0.39	0.40	0.39	0.40	0.39	0.40	0.58	0.61	0.35	0.35	2.56
Surface Load Reduction	kg/yr	3962	1529	3771	1685	4393	1076	4393	1076	6608	1624	2800	2096	35014
Load Trapped in Sediments	kg/yr	3482	1587	3866	1824	4523	1180	4523	1180	6804	1781	2862	2244	35856
Overall Load Reduction	%	65%	71%	62%	72%	72%	63%	72%	63%	72%	63%	51%	77%	89%
Lower Confidence Limit	%	58%	67%	53%	67%	64%	58%	64%	58%	63%	57%	42%	72%	85%
Upper Confidence Limit	%	72%	74%	70%	75%	79%	65%	79%	65%	79%	65%	60%	80%	93%
Daily Geometric Mean	ppb	62.0	15.4	67.5	16.0	49.2	15.7	49.2	15.7	49.4	15.8	85.0	16.9	#N/A
Outflow Geo Mean - Composites	ppb	62.5	16.5	68.1	17.2	49.8	16.8	49.8	16.8	50.0	17.0	87.7	18.4	17.1
Upper Confidence Limit	ppb	76.1	24.09	85.0	27.0	65.9	26.6	65.9	26.6	66.1	26.8	103.7	28.4	26.5
Lower Confidence Limit	ppb	49.2	11.12	52.0	11.0	36.0	10.7	36.0	10.7	36.1	10.8	71.0	11.9	11.0
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Frequency Outflow Conc > 20 ppb	%	100%	17%	100%	23%	100%	20%	100%	20%	100%	21%	100%	36%	72%
Frequency Outflow Conc > 50 ppb	%	84%	0%	95%	0%	55%	0%	55%	0%	55%	0%	100%	0%	22%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
95th Percentile Outflow Conc	ppb	86	24	93	26	64	26	64	26	65	26	126	27	26
Mean Biomass P Storage	mg/m2	3235	1010	3592	1160	3081	999	3081	999	3087	1005	4048	1340	2115
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Net Storage Turnover Rate	1/yr	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Unit Area P Removal	g/m2-yr	1030	322	1144	369	981	318	981	318	983	320	1289	427	674
Mean Water Load	cm/d	2.5	1.7	2.5	1.7	1.8	2.3	1.8	2.3	1.8	2.3	3.4	1.4	1.0
Max Water Load	cm/d	11.5	7.9	11.5	7.9	8.5	10.5	8.5	10.5	8.5	10.5	15.9	6.7	4.7
Mean Depth	cm	46	59	46	59	46	58	46	58	46	58	60	58	53
Minimum Depth	cm	27	38	27	38	26	37	26	37	26	37	46	40	33
Maximum Depth	cm	70	71	70	71	70	71	70	71	70	71	62	63	70
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Flow/Width	m2/day	54	54	54	54	54	54	54	54	54	54	30	32	50.6
HRT Days	days	18.7	34.5	18.7	34.5	25.4	25.9	25.4	25.9	25.3	25.7	17.5	40.3	52.8
Mean Velocity	cm/sec	0.13	0.11	0.13	0.11	0.13	0.11	0.13	0.11	0.14	0.11	0.06	0.06	0.11
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95th Percentile Outflow Volume	hm3/d	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.41	0.41	0.25	0.26	1.7
95th Percentile Outflow Load	kg/d	21.91	6.65	23.78	7.21	17.05	7.09	17.05	7.09	25.78	10.75	28.39	6.64	45.2
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Range Check - Mean Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Flow/Width	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Inflow Conc	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Outflow Conc	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%
Warning or Error Messages														0

Table A.11 STA-6: Case “2010 Alt1”

DMSTA2- Inputs & Outputs — **Project: PROJECT_STA6** — Model Release: 7/1/2005 — Current Date: 09/29/05

Input Variable	Units	Value
Design Case Name	-	2010 Alt1
Input Series Name		TS_USSO
Starting Date for Simulation	-	05/01/96
Ending Date for Simulation	-	04/30/05
Starting Date for Output	-	05/01/96
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-6 Section 1 Only
Inflows limited to historic discharges from C-139 Annex (USSO)
Eliminated seepage losses to L-3 Borrow Canal and norh line of STA
STA-6 Section 2 considered converted to use as Cell 6B in STA-5

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	25.5	32.8	19.6
GM Outflow C (ppb)	21.8	28.9	15.9
Load Reduction %	74%	67%	80%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.0%
Warning/Error Messages	1	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	3	5										
Vegetation Type	-->	PEW_3	PEW_3										
Inflow Fraction	-	0.273	0.727										
Downstream Cell Number	-												
Surface Area	km2	0.99	2.64										
Mean Width of Flow Path	km	0.61	1.31										
Number of Tanks in Series	-	3.0	3.0										
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	40										
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4										
Outflow Coefficient - Intercept	-	1	1										
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm												
Outflow Seepage Control Elev	cm												
Max Outflow Seepage Conc	ppb												
Seepage Recycle to Cell Number	-												
Seepage Recycle Fraction	-												
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30										
Initial P Storage Per Unit Area	mg/m2	500	500										
Initial Water Column Depth	cm	200	200										
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3						
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22						
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300						
K = Net Settling Rate at Steady State	m/yr	34.9	34.9	16.8	52.5	16.8	52.5						
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40						
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100						
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200						

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	4.22	4.89											4.89
Run Date	-	09/29/05	09/29/05											09/29/05
Starting Date for Simulation	-	05/01/96	05/01/96											05/01/96
Starting Date for Output	-	05/01/96	05/01/96											05/01/96
Ending Date	-	04/30/05	04/30/05											04/30/05
Output Duration	days	3287	3287											3287
Cell Label		3	5											Total
Downstream Cell Label		Outflow	Outflow											-
Network Simulation Name	-	none	none											none
Simulation Type	-	Uncerta	Uncerta											Uncerta
Surface Area	km2	0.99	2.64											3.63
Mean Rainfall	cm/yr	71.0	71.0											71.0
Mean ET	cm/yr	67.9	67.9											67.9
Cell Inflow Volume	hm3/yr	13.5	36.1											49.6
Cell Inflow Load	kg/yr	1331	3545											4877
Cell Inflow Conc	ppb	98.3	98.3											98.3
Treated Outflow Volume	hm3/yr	13.6	36.1											49.7
Treated Outflow Load	kg/yr	347	923											1269
Treated FWM Outflow Conc	ppb	25.5	25.5											25.5
Upper Confidence Limit	ppb	32.8	32.8											32.8
Lower Confidence Limit	ppb	19.6	19.6											19.6
Total Outflow Volume + Bypass	hm3/yr	13.6	36.1											49.7
Total Outflow Load + Bypass	kg/yr	347	923											1269.4
Total FWM Outflow Conc	ppb	25.5	25.5											25.5
Bypass Load	kg/yr	0	0											0.0
Bypass Load	%	0.0	0.0											0.0
Maximum Inflow	hm3/d	0.13	0.35											0.48
Maximum Outflow	hm3/d	0.13	0.35											0.49
Surface Load Reduction	kg/yr	985	2623											3607
Load Trapped in Sediments	kg/yr	1011	2694											3706
Overall Load Reduction	%	74%	74%											74%
Lower Confidence Limit	%	67%	67%											67%
Upper Confidence Limit	%	80%	80%											80%
Daily Geometric Mean	ppb	21.1	21.2											#N/A
Outflow Geo Mean - Composites	ppb	21.8	21.8											21.8
Upper Confidence Limit	ppb	28.9	28.88											28.9
Lower Confidence Limit	ppb	15.9	15.92											15.9
Frequency Outflow Conc > 10 ppb	%	100%	100%											100%
Frequency Outflow Conc > 20 ppb	%	68%	67%											98%
Frequency Outflow Conc > 50 ppb	%	0%	0%											67%
Freq Outflow Volume > 10 ppb	%	100%	100%											100%
95th Percentile Outflow Conc	ppb	32	32											32
Mean Biomass P Storage	mg/m2	1538	1538											1538
Storage Increase / Net Removal	%	0%	0%											0%
Net Storage Turnover Rate	1/yr	6.0	6.0											6.0
Unit Area P Removal	g/m2-yr	1021	1021											1021
Mean Water Load	cm/d	3.7	3.7											3.7
Max Water Load	cm/d	13.3	13.3											13.3
Mean Depth	cm	48	50											49
Minimum Depth	cm	33	33											33
Maximum Depth	cm	68	71											70
Frequency Depth < 10 cm	%	0.0%	0.0%											0.0%
Flow/Width	m2/day	61	75											71.4
HRT Days	days	12.8	13.3											13.2
Mean Velocity	cm/sec	0.15	0.17											0.17
Seepage Outflow / Total Outflow	%	0%	0%											0%
Release 1 Outflow Volume	hm3/yr	0.0	0.0											0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0											0.0
95th Percentile Outflow Volume	hm3/d	0.11	0.28											0.4
95th Percentile Outflow Load	kg/d	3.30	8.78											12.1
Simulated / Specified Mean Depth	%	#N/A	#N/A											#N/A
Release 1 Demand Met	%	#N/A	#N/A											#N/A
Release 2 Demand Met	%	#N/A	#N/A											#N/A
Outflow Demand Met	%	#N/A	#N/A											#N/A
Range Check - Mean Depth	-	-	-											0
Range Check - Freq Depth < 10 cm	-	-	-											0
Range Check - Flow/Width	-	0.88	-											1
Range Check - Inflow Conc	-	-	-											0
Range Check - Outflow Conc	-	-	-											0
Water Balance Error	%	0.00%	0.00%											0.00%
Mass Balance Error	%	0.00%	0.00%											0.00%
Warning or Error Messages		Cell# 1 3 Flow/Width out of calib. range for PEW_3: 61 vs. 69 - 276 m2/day												1

Table A.12 STA-6: Case “2010 Alt1 SAV”

DMSTA2- Inputs & Outputs — Project: PROJECT_STA6 — Model Release: 7/1/2005 — Current Date: 09/29/05

Input Variable	Units	Value
Design Case Name	-	2010 Alt1 SAV
Input Series Name		TS_USSO
Starting Date for Simulation	-	05/01/96
Ending Date for Simulation	-	04/30/05
Starting Date for Output	-	05/01/96
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-6 Section 1 Only
Inflows limited to historic discharges from C-139 Annex (USSO)
Eliminated seepage losses to L-3 Borrow Canal and north line
Vegetation considered as SAV in lieu of PEW

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	17.1	20.8	14.1
GM Outflow C (ppb)	13.4	17.2	10.5
Load Reduction %	83%	79%	86%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.0%
Warning/Error Messages	4	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	3	5										
Vegetation Type	-->	SAV_3	SAV_3										
Inflow Fraction	-	0.273	0.727										
Downstream Cell Number	-												
Surface Area	km2	0.99	2.64										
Mean Width of Flow Path	km	0.61	1.31										
Number of Tanks in Series	-	3.0	3.0										
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	40										
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4										
Outflow Coefficient - Intercept	-	1	1										
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm												
Outflow Seepage Control Elev	cm												
Max Outflow Seepage Conc	ppb												
Seepage Recycle to Cell Number	-												
Seepage Recycle Fraction	-												
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30										
Initial P Storage Per Unit Area	mg/m2	500	500										
Initial Water Column Depth	cm	200	200										
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3						
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22						
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300						
K = Net Settling Rate at Steady State	m/yr	52.5	52.5	16.8	52.5	16.8	52.5						
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40						
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100						
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200						

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	4.33	4.89											4.89
Run Date	-	09/29/05	09/29/05											09/29/05
Starting Date for Simulation	-	05/01/96	05/01/96											05/01/96
Starting Date for Output	-	05/01/96	05/01/96											05/01/96
Ending Date	-	04/30/05	04/30/05											04/30/05
Output Duration	days	3287	3287											3287
Cell Label		3	5											Total
Downstream Cell Label		Outflow	Outflow											-
Network Simulation Name	-	none	none											none
Simulation Type	-	Uncerta	Uncerta											Uncerta
Surface Area	km2	0.99	2.64											3.63
Mean Rainfall	cm/yr	71.0	71.0											71.0
Mean ET	cm/yr	67.9	67.9											67.9
Cell Inflow Volume	hm3/yr	13.5	36.1											49.6
Cell Inflow Load	kg/yr	1331	3545											4877
Cell Inflow Conc	ppb	98.3	98.3											98.3
Treated Outflow Volume	hm3/yr	13.6	36.1											49.7
Treated Outflow Load	kg/yr	232	617											848
Treated FWM Outflow Conc	ppb	17.1	17.1											17.1
Upper Confidence Limit	ppb	20.9	20.8											20.8
Lower Confidence Limit	ppb	14.1	14.1											14.1
Total Outflow Volume + Bypass	hm3/yr	13.6	36.1											49.7
Total Outflow Load + Bypass	kg/yr	232	617											848.3
Total FWM Outflow Conc	ppb	17.1	17.1											17.1
Bypass Load	kg/yr	0	0											0.0
Bypass Load	%	0.0	0.0											0.0
Maximum Inflow	hm3/d	0.13	0.35											0.48
Maximum Outflow	hm3/d	0.13	0.35											0.49
Surface Load Reduction	kg/yr	1100	2929											4028
Load Trapped in Sediments	kg/yr	1126	3000											4127
Overall Load Reduction	%	83%	83%											83%
Lower Confidence Limit	%	79%	79%											79%
Upper Confidence Limit	%	86%	86%											86%
Daily Geometric Mean	ppb	12.8	12.8											#N/A
Outflow Geo Mean - Composites	ppb	13.4	13.4											13.4
Upper Confidence Limit	ppb	17.2	17.16											17.2
Lower Confidence Limit	ppb	10.5	10.47											10.5
Frequency Outflow Conc > 10 ppb	%	87%	87%											87%
Frequency Outflow Conc > 20 ppb	%	8%	8%											28%
Frequency Outflow Conc > 50 ppb	%	0%	0%											8%
Freq Outflow Volume > 10 ppb	%	97%	97%											97%
95th Percentile Outflow Conc	ppb	23	23											23
Mean Biomass P Storage	mg/m2	1138	1139											1139
Storage Increase / Net Removal	%	0%	0%											0%
Net Storage Turnover Rate	1/yr	9.0	9.0											9.0
Unit Area P Removal	g/m2-yr	1137	1137											1137
Mean Water Load	cm/d	3.7	3.7											3.7
Max Water Load	cm/d	13.3	13.3											13.3
Mean Depth	cm	48	50											49
Minimum Depth	cm	33	33											33
Maximum Depth	cm	68	71											70
Frequency Depth < 10 cm	%	0.0%	0.0%											0.0%
Flow/Width	m2/day	61	75											71.4
HRT Days	days	12.8	13.3											13.2
Mean Velocity	cm/sec	0.15	0.17											0.17
Seepage Outflow / Total Outflow	%	0%	0%											0%
Release 1 Outflow Volume	hm3/yr	0.0	0.0											0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0											0.0
95th Percentile Outflow Volume	hm3/d	0.11	0.28											0.4
95th Percentile Outflow Load	kg/d	2.36	6.29											8.7
Simulated / Specified Mean Depth	%	#N/A	#N/A											#N/A
Release 1 Demand Met	%	#N/A	#N/A											#N/A
Release 2 Demand Met	%	#N/A	#N/A											#N/A
Outflow Demand Met	%	#N/A	#N/A											#N/A
Range Check - Mean Depth	-	0.77	0.80											2
Range Check - Freq Depth < 10 cm	-	-	-											0
Range Check - Flow/Width	-	0.38	0.47											2
Range Check - Inflow Conc	-	-	-											0
Range Check - Outflow Conc	-	-	-											0
Water Balance Error	%	0.00%	0.00%											0.00%
Mass Balance Error	%	0.00%	0.00%											0.00%
Warning or Error Messages														4

Cell# 1 3 Depth out of calib. range for SAV_3: 48 vs. 62 - 87 cm
Cell# 1 3 Flow/Width out of calib. range for SAV_3: 61 vs. 162 - 374 m2/day
Cell# 2 5 Depth out of calib. range for SAV_3: 50 vs. 62 - 87 cm
Cell# 2 5 Flow/Width out of calib. range for SAV_3: 75 vs. 162 - 374 m2/day

Table A.13 STA-3/4: Case "Alt1_w_S2S3"

DMSTA2- Inputs & Outputs | **Project: PROJECT_A1RES_NETWORK** | Model Release: 9/30/2005 | Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	ALT1_w_S2S3
Input Series Name		TS_2010_w_S2S
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-3/4, 2010-2014, Alternative 1; simulated back pumping to Lake at S-2 and S-3 included in direct inflows
Receives inflows from EAASR Compartment A-1; STA enhanced per LTP (including SAV in Cell 1B)
Also receives direct inflows from NNRC at G-370 and Miami Canal at G-372
Water supply releases to LEC and Big Cypress Reservation excluded from treatment area inflows

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	20.3	#N/A	#N/A
GM Outflow C (ppb)	15.2	#N/A	#N/A
Load Reduction %	78%	#N/A	#N/A
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.1%	0.1%
Iterations & Convergence	3	0.0%
Warning/Error Messages	4	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	2A	2B	3A	3B						
Vegetation Type	-->	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3						
Inflow Fraction	-	0.4		0.33		0.27							
Downstream Cell Number	-	2		4		6							
Surface Area	km2	12.30	14.12	10.29	11.71	9.61	8.92						
Mean Width of Flow Path	km	3.42	4.50	2.89	4.02	4.88	4.88						
Number of Tanks in Series	-	6.0	3.0	6.0	3.0	4.0	4.0						
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	60	60	60	60	60	60						
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4						
Outflow Coefficient - Intercept	-	1	1	1	1	1	1						
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0058	0.0029	0.0014		0.0038							
Outflow Seepage Control Elev	cm	16	40	-67		-64							
Max Outflow Seepage Conc	ppb	20	20	20		20							
Seepage Recycle to Cell Number	-	1	1	3		3							
Seepage Recycle Fraction	-	0.5	0.5	0.5		0.5							
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30						
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500						
Initial Water Column Depth	cm	200	200	200	200	200	200						
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3						
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22						
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300						
K = Net Settling Rate at Steady State	m/yr	16.8	52.5	16.8	52.5	16.8	52.5						
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40						
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100						
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200						

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	8.00	8.43	9.17	9.63	10.17	10.71							10.71
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05							09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00							04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784							12784
Cell Label		1A	1B	2A	2B	3A	3B							Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow							-
Network Simulation Name	-	1_Alt1_w_S2S	1_Alt1_w_S2S	1_Alt1_w_S2S	1_Alt1_w_S2S	_Alt1_w_S2	Alt1_w_S2S3							A1_Alt1_w_S2
Simulation Type	-	Base	Base	Base	Base	Base	Base							Base
Surface Area	km2	12.30	14.12	10.29	11.71	9.61	8.92							66.94
Mean Rainfall	cm/yr	130.0	130.0	130.0	130.0	130.0	130.0							130.0
Mean ET	cm/yr	134.9	134.9	134.9	134.9	134.8	134.9							134.9
Cell Inflow Volume	hm3/yr	303.3	297.9	250.3	254.3	204.8	188.1							758.4
Cell Inflow Load	kg/yr	27652	17486	22812	14759	18665	10602							69129
Cell Inflow Conc	ppb	91.2	58.7	91.2	58.0	91.2	56.4							91.2
Treated Outflow Volume	hm3/yr	297.9	293.6	254.3	253.7	188.1	187.7							735.0
Treated Outflow Load	kg/yr	17486	5983	14759	5152	10602	3770							14904
Treated FWM Outflow Conc	ppb	58.7	20.4	58.0	20.3	56.4	20.1							20.3
Upper Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Lower Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Total Outflow Volume + Bypass	hm3/yr	297.9	293.6	254.3	253.7	188.1	187.7							735.0
Total Outflow Load + Bypass	kg/yr	17486	5983	14759	5152	10602	3770							14904.4
Total FWM Outflow Conc	ppb	58.7	20.4	58.0	20.3	56.4	20.1							20.3
Bypass Load	kg/yr	0	0	0	0	0	0							0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0							0.0
Maximum Inflow	hm3/d	4.51	4.46	3.72	3.71	3.04	3.01							11.28
Maximum Outflow	hm3/d	4.46	4.43	3.71	3.71	3.01	3.01							11.15
Surface Load Reduction	kg/yr	10165	11503	8054	9607	8063	6833							54224
Load Trapped in Sediments	kg/yr	9857	11878	8161	9990	7298	7118							54303
Overall Load Reduction	%	37%	66%	35%	65%	43%	64%							78%
Lower Confidence Limit	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Upper Confidence Limit	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Daily Geometric Mean	ppb	49.0	11.7	48.7	12.0	48.7	10.5							#N/A
Outflow Geo Mean - Composites	ppb	52.1	15.7	51.7	15.4	52.2	15.4							15.2
Upper Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Lower Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Frequency Outflow Conc > 10 ppb	%	100%	86%	100%	84%	100%	85%							84%
Frequency Outflow Conc > 20 ppb	%	100%	28%	100%	28%	100%	26%							59%
Frequency Outflow Conc > 50 ppb	%	65%	0%	64%	0%	67%	0%							26%
Freq Outflow Volume > 10 ppb	%	100%	94%	100%	94%	100%	93%							94%
95th Percentile Outflow Conc	ppb	66	25	65	25	64	25							25
Mean Biomass P Storage	mg/m2	2517	843	2491	855	2385	800							1621
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%							0%
Net Storage Turnover Rate	1/yr	11.1	34.9	11.1	34.9	11.1	34.9							17.5
Unit Area P Removal	mg/m2-yr	802	842	793	853	759	798							811
Mean Water Load	cm/d	6.8	5.8	6.7	5.9	5.8	5.8							3.1
Max Water Load	cm/d	36.7	31.6	36.2	31.7	31.7	33.7							16.8
Mean Depth	cm	67	64	69	64	57	60							64
Minimum Depth	cm	37	28	50	32	5	29							31
Maximum Depth	cm	101	95	101	94	84	85							94
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%							0.0%
Flow/Width	m2/day	243	181	237	173	115	106							180.1
HRT Days	days	9.9	11.0	10.3	10.8	9.8	10.4							20.6
Mean Velocity	cm/sec	0.42	0.33	0.40	0.31	0.23	0.20							0.32
Seepage Outflow / Total Outflow	%	2%	1%	1%	0%	4%	0%							3%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
95th Percentile Outflow Volume	hm3/d	2.32	2.29	1.95	1.94	1.54	1.52							5.7
95th Percentile Outflow Load	kg/d	143.31	54.98	118.78	46.36	90.25	35.80							135.9
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Range Check - Mean Depth	-	-	-	-	-	-	0.97							1
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-							0
Range Check - Flow/Width	-	1.16	-	1.13	-	-	0.65							3
Range Check - Inflow Conc	-	-	-	-	-	-	-							0
Range Check - Outflow Conc	-	-	-	-	-	-	-							0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.00%
Mass Balance Error	%	0.11%	0.02%	0.11%	0.02%	0.04%	0.08%							0.11%
Warning or Error Messages														4

Cell# 1 1A Flow/Width out of calib. range for EMG_3: 243 vs. 26 - 210 m2/day
Cell# 3 2A Flow/Width out of calib. range for EMG_3: 237 vs. 26 - 210 m2/day
Cell# 6 3B Depth out of calib. range for SAV_3: 60 vs. 62 - 87 cm
Cell# 6 3B Flow/Width out of calib. range for SAV_3: 106 vs. 162 - 374 m2/day

Table A.14 STA-3/4: Case “2010 All”

DMSTA2- Inputs & Outputs — Project: PROJECT_A1RES_NETWORK — Model Release: 9/30/2005 — Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	2010 All
Input Series Name		TS_2010_All
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-3/4, 2010-2014, Alternative 1; simulated back pumping to Lake at S-2 and S-3 included in direct inflows
Receives inflows from EAASR Compartment A-1; STA enhanced per LTP (including SAV in Cell 1B)
Also receives direct inflows from NNRC at G-370 and Miami Canal at G-372
Water supply releases to LEC and Big Cypress Reservation included in treatment area inflows

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	21.1	#N/A	#N/A
GM Outflow C (ppb)	16.9	#N/A	#N/A
Load Reduction %	77%	#N/A	#N/A
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.1%	0.1%
Iterations & Convergence	3	0.0%
Warning/Error Messages	3	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	2A	2B	3A	3B						
Vegetation Type	-->	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3						
Inflow Fraction	-	0.4		0.33		0.27							
Downstream Cell Number	-	2		4		6							
Surface Area	km2	12.30	14.12	10.29	11.71	9.61	8.92						
Mean Width of Flow Path	km	3.42	4.50	2.89	4.02	4.88	4.88						
Number of Tanks in Series	-	6.0	3.0	6.0	3.0	4.0	4.0						
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	60	60	60	60	60	60						
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4						
Outflow Coefficient - Intercept	-	1	1	1	1	1	1						
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0058	0.0029	0.0014		0.0038							
Outflow Seepage Control Elev	cm	16	40	-67		-64							
Max Outflow Seepage Conc	ppb	20	20	20		20							
Seepage Recycle to Cell Number	-	1	1	3		3							
Seepage Recycle Fraction	-	0.5	0.5	0.5		0.5							
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30						
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500						
Initial Water Column Depth	cm	200	200	200	200	200	200						
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3						
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22						
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300						
K = Net Settling Rate at Steady State	m/yr	16.8	52.5	16.8	52.5	16.8	52.5						
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40						
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100						
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200						

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	8.29	8.74	9.49	9.94	10.49	11.03							11.03
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05							09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00							04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784							12784
Cell Label		1A	1B	2A	2B	3A	3B							Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow							-
Network Simulation Name	-	A1_2010_All	A1_2010_All	A1_2010_All	A1_2010_All	A1_2010_A	A1_2010_All							A1_2010_All
Simulation Type	-	Base	Base	Base	Base	Base	Base							Base
Surface Area	km2	12.30	14.12	10.29	11.71	9.61	8.92							66.94
Mean Rainfall	cm/yr	130.0	130.0	130.0	130.0	130.0	130.0							130.0
Mean ET	cm/yr	134.9	134.9	134.9	134.9	134.9	134.9							134.9
Cell Inflow Volume	hm3/yr	363.0	357.3	299.5	303.8	245.0	227.6							907.4
Cell Inflow Load	kg/yr	31886	21343	26306	17967	21523	13117							79716
Cell Inflow Conc	ppb	87.8	59.7	87.8	59.1	87.8	57.6							87.8
Treated Outflow Volume	hm3/yr	357.3	352.5	303.8	303.2	227.6	227.2							882.9
Treated Outflow Load	kg/yr	21343	7476	17967	6438	13117	4718							18632
Treated FWM Outflow Conc	ppb	59.7	21.2	59.1	21.2	57.6	20.8							21.1
Upper Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Lower Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Total Outflow Volume + Bypass	hm3/yr	357.3	352.5	303.8	303.2	227.6	227.2							882.9
Total Outflow Load + Bypass	kg/yr	21343	7476	17967	6438	13117	4718							18632.2
Total FWM Outflow Conc	ppb	59.7	21.2	59.1	21.2	57.6	20.8							21.1
Bypass Load	kg/yr	0	0	0	0	0	0							0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0							0.0
Maximum Inflow	hm3/d	4.51	4.46	3.72	3.71	3.04	3.01							11.28
Maximum Outflow	hm3/d	4.46	4.43	3.71	3.71	3.01	3.01							11.15
Surface Load Reduction	kg/yr	10543	13867	8339	11530	8407	8399							61084
Load Trapped in Sediments	kg/yr	10173	14219	8434	11912	7662	8685							61085
Overall Load Reduction	%	33%	65%	32%	64%	39%	64%							77%
Lower Confidence Limit	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Upper Confidence Limit	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Daily Geometric Mean	ppb	52.9	14.8	52.6	15.1	50.3	13.4							#N/A
Outflow Geo Mean - Composites	ppb	55.6	17.2	55.1	17.2	53.8	16.7							16.9
Upper Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Lower Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Frequency Outflow Conc > 10 ppb	%	100%	93%	100%	93%	100%	91%							93%
Frequency Outflow Conc > 20 ppb	%	100%	36%	100%	36%	100%	34%							67%
Frequency Outflow Conc > 50 ppb	%	78%	0%	77%	0%	72%	0%							35%
Freq Outflow Volume > 10 ppb	%	100%	97%	100%	97%	100%	95%							97%
95th Percentile Outflow Conc	ppb	66	27	66	27	64	26							27
Mean Biomass P Storage	mg/m2	2598	1009	2574	1019	2503	975							1753
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%							0%
Net Storage Turnover Rate	1/yr	11.1	34.9	11.1	34.9	11.1	34.9							18.2
Unit Area P Removal	mg/m2-yr	827	1007	820	1017	797	974							912
Mean Water Load	cm/d	8.1	6.9	8.0	7.1	7.0	7.0							3.7
Max Water Load	cm/d	36.7	31.6	36.2	31.7	31.7	33.7							16.8
Mean Depth	cm	71	67	71	67	63	63							67
Minimum Depth	cm	39	36	50	40	12	37							36
Maximum Depth	cm	101	95	101	94	84	85							94
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%							0.0%
Flow/Width	m2/day	291	217	284	207	137	128							215.8
HRT Days	days	8.7	9.7	8.9	9.5	9.0	9.0							18.1
Mean Velocity	cm/sec	0.48	0.37	0.46	0.36	0.25	0.23							0.37
Seepage Outflow / Total Outflow	%	2%	1%	1%	0%	4%	0%							2%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
95th Percentile Outflow Volume	hm3/d	2.42	2.42	2.03	2.04	1.61	1.63							6.1
95th Percentile Outflow Load	kg/d	156.44	62.36	129.84	52.52	98.90	40.51							154.8
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Range Check - Mean Depth	-	-	-	-	-	-	-							0
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-							0
Range Check - Flow/Width	-	1.38	-	1.35	-	-	0.79							3
Range Check - Inflow Conc	-	-	-	-	-	-	-							0
Range Check - Outflow Conc	-	-	-	-	-	-	-							0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.00%
Mass Balance Error	%	0.09%	0.02%	0.09%	0.02%	0.04%	0.06%							0.10%
Warning or Error Messages														3

Warning or Error Messages:
Cell# 1 1A Flow/Width out of calib. range for EMG_3: 291 vs. 26 - 210 m2/day
Cell# 3 2A Flow/Width out of calib. range for EMG_3: 284 vs. 26 - 210 m2/day
Cell# 6 3B Flow/Width out of calib. range for SAV_3: 128 vs. 162 - 374 m2/day