Everglades Agricultural Area Regional Feasibility Study

Deliverable 2.2 – Optimum Allocation of Loads to the STAs for the Period 2006-2009 (Final Report)

(Contract No. CN040912-WO04 Phase 2)

Prepared for:

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September 7, 2005

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South Florida Water Management District
EAA Regional Feasibility Study
ADA Contract No. CN040912-WO04 Phase 2
Inflow Data Sets for the Period 2006-2009
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 2006-2009". This document constitutes Deliverable 2.2 under ADA Engineering, Inc. Task Order No. BM-05WO04-02 dated April 27, 2005. The August 9, 2005 draft deliverable has been updated to respond to comments received as indicated in my memorandum of September 2, 2005 to Mr. Roger Copp of ADA.

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 under Task 2 "Optimum Allocation of Phosphorus and Hydraulic Loading to the Existing STAs" of the SFWMD Work Order No. CN040912-WO04. The overall objective of Task 2 is to evaluate the redistribution of hydraulic and total phosphorus loads to the STAs (both existing and the currently planned STA-6, Section 2, STA-2 Cell 4, and STA-5 third flow-way) to optimize phosphorus reduction. Information developed in this document is also intended to provide basic input to the completion of work under Task 3, Phase 1 (Draft Operating Strategy for Optimizing STA Performance with Existing EAA Canals) being prepared by ADA Engineering, Inc. under SFWMD Contract No. CN040912-WO03.

This analysis is specific to the period 2006-2009 (e.g., following completion of the currently planned STA-6, Section 2; STA-2 Cell 4; and third flow-way at STA-5, but prior to completion of presently planned CERP or Acceler8 projects in the basins considered).

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 1.3.2: *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.

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.

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.

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 resulting from the DMSTA2 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. Three 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.

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. 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) 2006 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. In some instances, such as the elimination of inflows to the STA-1 Inflow and Distribution Works from the L-8 Borrow Canal, it may be necessary to institute certain structural changes in addition to the operations changes defined above.

For the period 2006-2009, 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 estimated average annual inflows to the STA-1 Inflow and Distribution Works is presented in Table 2.1.

Table 2.1 Estimated 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	234,809	44,582	154	Deliverable 1.5.2, Table 3.11
EBWCD	15,212	9,386	500	Deliverable 1.5.2, Table 2.3
Lake Okeechobee	16,726	2,468	120	Deliverable 1.5.2, Table 6.8
Total Inflow	266,747	56,436	172	
Assumed Bypass	16,726	2,468	120	Water Supply to LEC and L-8
Inflow to be Treated	**250,021**	**53,968**	**175**	

Of the total water supply bypass volume, an average annual volume of 3,622 acre-feet per year is simulated as discharged to the LNWR, with the balance delivered to the L-8 borrow canal (reference Table 5.3 of Deliverable 1.1.2). The average annual TP load discharged to the LNWR in the water supply bypass is estimated to be 0.53 metric tons. It should also be noted that the S-5A Basin runoff listed in Table 2.1 excludes that part of the basin runoff considered diverted to STA-2 through the S-5A Basin Diversion Works.

2.1. Inflows to STA-1W Based on Current Operations of G-302

At present, operations of the STA-1 Inflow and Distribution Works are normally structured to maximize the proportion of inflows to that area delivered through G-302 to STA-1W. As a result, it might be practicable to simply assign inflows up to the nominal capacity G-302 (3,250 cfs) to STA-1W, with the balance (e.g., S-5A discharges exceeding 3,250 cfs) considered delivered either to STA-1E through G-311 or bypassed to the LNWR through G-300 and G-301. However, application of a such a simplistic distribution of flow to the results of the SFWMM simulation is not considered advisable.

The simulation reports estimated mean daily discharges. In the instance of pumping station operations, such as at S-5A, the District's operational practice is to, in the interest of limiting operational expenditures, limit pumping operations to a single shift per day when practicable, and to minimize the use of second and third shifts. As a result, much of the simulated mean daily discharges at any given pumping station will occur at rates higher than the mean daily rates resulting from the simulation. In most application in the ECP, where the pumping stations discharge to large stormwater treatment areas, the influence of that operational distinction may be neglected. However, S-5A discharges to the relatively small footprint of the STA-1 Inflow and Distribution Works, where available storage is limited. It is therefore desirable to assess the distribution of outflows from that area on a basis other than simple assignation of mean daily inflows on the basis of relative capacity of the various discharge structures.

For this analysis, the distribution of discharges from the STA-1 Inflow and Distribution Works is based on evaluation of the distribution of inflows resulting from the District's actual operations of G-302 during full operation of STA-1W.

The initial filling of Cell 5 of STA-1W was begun on March 18, 1999; flow-through operations began July 7, 2000. Review of discharge data for Water Year 2001 reveals that roughly 38% of the total pumped discharges passed through Pumping Station G-310; pump testing at G-310 was not completed until the fall of 2000. That low utilization of the primary outflow pumping station leads to the presumption that STA-1W was not in full flow-through operations during significant parts of Water Year 2001.

In addition, Cells 5A and 5B were taken off line over the period February 15, 2003 through August 15, 2003 (Water Years 2003 and 2004) to permit construction of a limerock berm across Cell 5B as one element of the Process Development and Engineering (PDE) component of the *Long-Term Plan*. Cells 2 and 4 were taken off line over the period February 2004 through August 2004 (affecting the data for Water Year 2004) to allow an opportunity for tussocks in those cells to re-root, and to provide a "resting" interval following a period of extreme high inflows from Lake Okeechobee.

The above periods subsequent to July 2000 were excluded from the analysis, as the reduced utilization of STA-1W during those periods would suggest that discharges through G-302 would have been at less than normal capacity. In addition, discharges during Water Year 2005 were not considered in this analysis, as discharges to STA-1W have been curtailed in connection with on-going recovery actions in that STA.

Daily discharges were downloaded from the District's DBHYDRO data base for S-5A (DBKEY JW226), S-5AS (DBKEY TA410), and G-302 (DBKEY JJ806). Only positive discharges were considered in the analysis. The data was then screened to limit the analysis to the remaining periods of full operation of STA-1W during WY 2002-2004 (total of 824 days of full operation). Discharges from G-302 were then plotted against same-day inflows to the STA-1 Inflow and Distribution Works, and an approximate relationship was fit to the plotted data. For total daily inflows to the Inflow and Distribution Works up to 2,000 cfs, all inflows were assigned to STA-1W through G-302 (note that a daily inflow of 2,000 cfs is equivalent to pumping S-5A at capacity for a 10-hour period). For daily inflows above 2,000 cfs, the discharge at G-302 was computed as:

$$Q(G\text{-}302) = 2{,}000 + (Q(total) - 2{,}000)\exp(0.8984)$$

For a total inflow to the STA-1 Inflow & Distribution Works of 4,800 cfs (capacity of S-5A), the distribution resulting from the above relationship would assign 3,250 cfs to G-302 (equal to its nominal capacity), and 1,550 cfs to other points of discharge (equal to the nominal capacity of G-311).

A plot of the data employed in this analysis, on which the flow distribution resulting from the above relationship is superimposed, is presented in Figure 2.1.

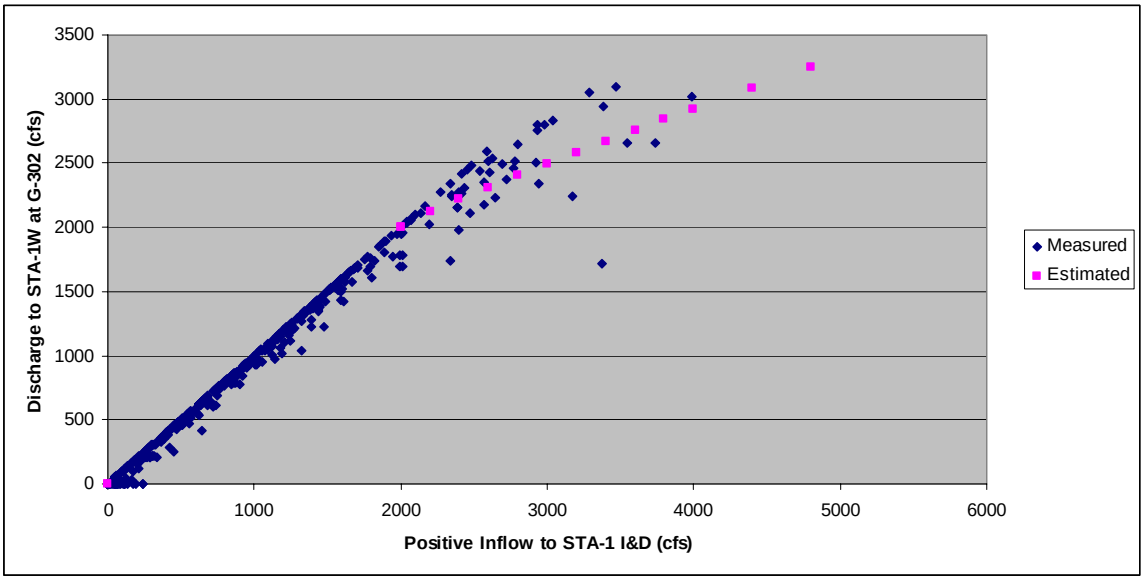

Figure 2.1 Distribution of Discharges through G-302

2.2. Cases Considered in DMSTA2 Analysis of STA-1W

A total of three potential inflow cases were considered in the DMSTA2 analysis of STA-1W. The three cases considered are described as follows:

- **2006 All:** All inflows to the STA-1 Inflow and Distribution Works were assigned to STA-1W. This case was included in the analysis to provide a frame of reference for assessment of the influence of diversions to STA-1E on the projected performance of STA-1W, and was structured upon the assumption that all runoff from the S-5A Basin could be delivered to and carried through STA-1W. That condition is not

physically possible, due to the hydraulic limitations of G-302 and the STA itself, analysis of this case (and Case "2006 All for STA-1E") was included simply to permit a basic assessment of potential imbalances in loading to the two treatment areas.

- **2006 Base:** For this case, discharges from the STA-1 Inflow and Distribution Works to STA-1W were assumed governed by the relationship presented above. This case would be considered most representative of current operations in STA-1W coupled with the revised inflows applicable to the period 2006-2009. Inflows to the STA-1W Inflow and Distribution Works exceeding the assigned discharges at G-302 were considered as delivered to the West Distribution Cell of STA-1E through G-311.

- **2006 Mod:** For this case, a modified distribution of discharges through G-302 and G-311 was assumed. Daily inflows to the STA-1 Inflow and Distribution Works were distributed 70% to STA-1W at G-302, and 30% to STA-1E at G-311. Those distributions closely parallel the relative capacities of G-302 and G-311.

2.3. Summary of DMSTA2 Results

Table 2.2 presents a summary of the results of the DMSTA2 analyses for STA-1W. Summary DMSTA2 input and output data for each case are included in Appendix A.

Table 2.2 Summary of DMSTA2 Analyses, STA-1W, WY 1966-2000

Parameter	Units	Summary of Results by Case		
		2006 All	2006 Base	2006 Mod
Average Annual Inflow				
Volume	1,000 ac-ft	250.2	240.8	175.1
TP Load	metric tons	53.80	51.73	37.66
FWM TP Concentration	ppb	174	174	174
Average Annual Outflow				
Volume	1,000 ac-ft	251.0	241.6	176.7
FWM TP Concentration				
Upper Confidence Limit	ppb	24.2	21.8	16.7
Mean Estimate	ppb	30.0	27.5	20.3
Lower Confidence Limit	ppb	37.3	34.5	25.2
Geometric Mean TP Conc.				
Upper Confidence Limit	ppb	16.0	15.2	9.8
Mean Estimate	ppb	21.8	20.9	13.5
Lower Confidence Limit	ppb	29.1	27.9	18.5
TP Load (Using Mean FWM Conc.)	metric tons	9.30	8.19	4.43
For Detailed Results, See Appendix A		Table A.1	Table A.2	Table A.3
Summary of Bypasses and Diversions				
Water Supply to LEC and L-8				
Volume	1,000 ac-ft	16.7	16.7	16.7
TP Load	metric tons	2.47	2.47	2.47
FWM TP Concentration	ppb	120	120	120
Divert to STA-1E Through G-311				
Volume	1,000 ac-ft	0.0	9.4	75.1
TP Load	metric tons	0.00	2.07	16.14
FWM TP Concentration	ppb	---	174	174

3. 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) 2006 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 Structure 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 some instances, such as the elimination of inflows to the STA-1 Inflow and Distribution Works from the L-8 Borrow Canal, it may be necessary to institute certain structural changes in addition to the operations changes defined above.

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 2006-2009, inflows to the C-51 West Canal 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 3.1.

Table 3.1 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	128,013	21,913	139	Deliverable 1.5.2, Table 5.5
Acme Basin B	33,196	4,633	113	Deliverable 1.5.2, Table 5.7
L-8 Basin	71,528	6,903	78	Deliverable 1.5.2, Table 5.2
Total Inflow	232,737	33,449	117	
Assumed Bypass	71,528	9,407	107	L-8 Runoff Through S-155A
Inflow to be Treated	**161,209**	**24,042**	**121**	

In addition to the above average annual inflows to the C-51 West Canal, discharges from the STA-1 Inflow and Distribution Works through Structure G-311 are considered in the overall inflows to STA-1E.

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

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

- **2006 All:** All inflows to the C-51 West Canal (including inflows from the L-8 Basin) were assigned to STA-1E. For this case, which would parallel the "2006 All"

case for STA-1W, there would be no inflows to STA-1E from G-311. All inflows to the STA-1 Inflow and Distribution Works were assigned to STA-1W. This case was included in the analysis to provide a frame of reference for assessment of the influence of diversions at G-311 on the projected performance of STA-1E, and was structured upon the assumption that all runoff from the S-5A Basin could be delivered to and carried through STA-1W. That condition is not physically possible, due to the hydraulic limitations of G-302 and the STA itself, analysis of this case (and Case "2006 All for STA-1E") was included simply to permit a basic assessment of potential imbalances in loading to the two treatment areas, and to confirm the need for bypass of inflows from the L-8 Basin.

- **2006 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 3.1 (e.g., bypass of inflow volumes from the L-8 Basin). In addition, inflows to the westerly flow path (Cells 5-7) of STA-1E would include discharges from the STA-1 Inflow and Distribution Works through Structure G-311. For this case, those discharges were considered equal to those developed under the "2006 Base" case for STA-1W (approximately 9,400 acre-feet per year at a flow-weighted mean TP concentration of 174 ppb). This case would be considered most representative of current operations in STA-1W and intended operations in STA-1E coupled with the revised inflows applicable to the period 2006-2009. For analysis of this case, the westerly flow path (Cells 5-7) was considered separately from the two easterly flow paths (Cells 1-4S). Analysis of the westerly flow path is included in **Case 5_7 2006 Base.** Inflows to the westerly flow path included discharges from G-311 and 20% of the inflow to STA-1E at S-319. Analysis of the two easterly flow paths (Cells 1-4S) is included in **Case 1_4 2006 Base,** for which inflows were limited to the remaining 80% of the inflow to STA-1E at S-319.

- **2006 Mod:** For this case, a modified distribution of discharges through G-302 and G-311 was assumed, consistent with Case "2006 Mod" for STA-1W. Daily inflows to the STA-1 Inflow and Distribution Works were distributed 70% to STA-1W at G-302, and 30% to STA-1E at G-311. Those distributions closely parallel the relative capacities of G-302 and G-311. For analysis of this case, the westerly flow path

(Cells 5-7) was considered separately from the two easterly flow paths (Cells 1-4S). Analysis of the westerly flow path is included in **Case 5_7 2006 Mod.** Inflows to the westerly flow path were limited to discharges from G-311, which were assigned at 30% of the total inflow to the STA-1 Inflow and Distribution Works (approximately 75,100 acre-feet per year at a flow-weighted mean TP concentration of 174 ppb). Analysis of the two easterly flow paths (Cells 1-4S) is included in **Case 1_4 2006 Mod,** for which inflows were assigned at 100% of the inflow to STA-1E at S-319.

For both **2006 Base** and **2006 Mod**, seepage lost from the West Distribution Cell of STA-1E to the C-51 West Canal was assigned to the two easterly flow paths**,** essentially reducing total flows through Cells 5-7 and increasing total flows through Cells 1-4S.

3.2. Summary of DMSTA2 Results

Table 3.2 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 3.2 Summary of DMSTA2 Analyses, STA-1E, WY 1966-2000

Parameter	Units	Summary of Results by Case				
			2006 Base		2006 Mod	
		2006 All	1_4 2006Base	5_72006Base	1_4 2006Mod	5_7 2006 Mod
Average Annual Inflow						
Volume	1,000 ac-ft	232.9	135.6	41.7	167.8	75.1
TP Load	metric tons	33.47	20.21	6.88	25.02	16.14
FWM TP Concentration	ppb	117	121	134	121	174
Total for Case						
Volume	1,000 ac-ft	232.9	177.2		242.9	
TP Load	metric tons	33.47	27.09		41.16	
FWM TP Concentration	ppb	117	124		137	
Average Annual Outflow						
Volume	1,000 ac-ft	229.3	137.0	37.9	169.4	71.6
FWM TP Concentration						
Upper Confidence Limit	ppb	17.3	13.8	18.0	18.4	21.5
Mean Estimate	ppb	22.1	18.3	19.5	24.3	27.2
Lower Confidence Limit	ppb	27.9	24.1	21.7	31.2	34.9
Geometric Mean TP Conc.						
Upper Confidence Limit	ppb	10.5	10.6	4.9	14.8	12.3
Mean Estimate	ppb	14.5	14.9	5.9	20.5	17.5
Lower Confidence Limit	ppb	19.8	20.5	7.6	27.3	24.5
TP Load (Using Mean FWM Conc.)	metric tons	6.24	3.10	0.91	5.08	2.41
For Detailed Results, See Appendix A		Table A.4	Table A.5	Table A.6	Table A.7	Table A.8
Total For Case						
Volume	1,000 ac-ft	229.3	174.9		240.9	
Flow-Weighted Mean TP Concentration						
Upper Confidence Limit	ppb	17.3	14.7		19.3	
Mean Estimate	ppb	22.1	18.6		25.2	
Lower Confidence Limit	ppb	27.9	23.6		32.3	
TP Load (Using Mean FWM Conc.)	metric tons	6.24	4.02		7.48	
Summary of Bypasses and Diversions						
Bypass Through S-155A						
Volume	1,000 ac-ft	0.0	71.5		71.5	
TP Load	metric tons	0.00	9.41		9.41	
FWM TP Concentration	ppb	---	107		107	

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

Table 3.3 summarizes total estimated discharges to the Loxahatchee National Wildlife Refuge (LNWR) from STA-1W and STA-1E under the three basic cases considered for the combined operations of those two treatment areas. That tabulation excludes water supply bypasses to the Lower East Coast.

Table 3.3 Total Estimated Treated Discharges to LNWR

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
Case 2006 All				
STA-1W				Table 2.2
Upper Conf. Limit	251.0	7.50	24.2	
Mean Estimate	251.0	9.30	30.0	
Lower Conf. Limit	251.0	11.56	37.3	
STA-1E				Table 3.2
Upper Conf. Limit	229.3	4.88	17.3	
Mean Estimate	229.3	6.24	22.1	
Lower Conf. Limit	229.3	7.88	27.9	
Total Inflow				
Upper Conf. Limit	480.3	12.4	20.9	
Mean Estimate	480.3	15.5	26.2	
Lower Conf. Limit	480.3	19.4	32.8	
Case 2006 Base				
STA-1W				Table 2.2
Upper Conf. Limit	241.6	6.49	21.8	
Mean Estimate	241.6	8.19	27.5	
Lower Conf. Limit	241.6	10.27	34.5	
STA-1E				Table 3.2
Upper Conf. Limit	174.9	3.18	14.7	
Mean Estimate	174.9	4.02	18.6	
Lower Conf. Limit	174.9	5.10	23.6	
Total Inflow				
Upper Conf. Limit	416.5	9.7	18.8	
Mean Estimate	416.5	12.2	23.7	
Lower Conf. Limit	416.5	15.4	29.9	
Case 2006 Mod				
STA-1W				Table 2.2
Upper Conf. Limit	176.7	3.65	16.7	
Mean Estimate	176.7	4.43	20.3	
Lower Conf. Limit	176.7	5.50	25.2	
STA-1E				Table 3.2
Upper Conf. Limit	240.9	5.74	19.3	
Mean Estimate	240.9	7.48	25.2	
Lower Conf. Limit	240.9	9.60	32.3	
Total Inflow				
Upper Conf. Limit	417.6	9.4	18.2	
Mean Estimate	417.6	11.9	23.1	
Lower Conf. Limit	417.6	15.1	29.3	

In addition, for each of the three basic 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 2.2 and the text immediately following that table).

3.4. Bypass Flows and Loads Through S-155A

Under the "2006 All" cases for STA-1W and STA-1E, there would be little or no bypass of flow and TP load (other than dedicated water supply) through Structure S-155A. Under both "2006 Base" and "2006 Mod", an average annual volume of 71.5 thousand acre-feet at a flow-weighted mean TP concentration of 107 ppb (average annual TP load of 9.41 metric tons) would bypass STA-1E through S-155A. That bypass would result in a reduction in the total average annual TP load discharged to the LNWR of roughly 3.5 metric tons.

Table 3.4 summarizes the estimated average annual historic discharges to the east at the current location of S-155A. That summary is generally based on information presented in Deliverable 1.3.2 (historic data for Water Years 1995-2004), with the exception of the volumes and loads associated with C-51 West Basin runoff (for which no direct records are available). Average annual volumes and loads associated with C-51 West Basin runoff are taken from the results presented in Deliverable 1.5.2, and should thus be considered understated, as for much of that period the area now comprising STA-1E contributed to overall basin runoff.

Table 3.4 Historic (WY 1995-2004) Discharges at Current Location of S-155A

Source	Estimated Average Annual Discharge, WY 1995-2004			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
C-51 West Basin	128,013	21,913	139	Deliverable 1.5.2, Table 5.5
L-8 Basin at S-5AE	66,266	5,068	62	Deliverable 1.3.2, Table 6.20
S-5AS	49,581	6,067	99	Deliverable 1.3.2, Table 6.19
Lake Okeechobee	34,623	7,908	185	Deliverable 1.3.2, Table 6.18
Total Discharge	278,483	40,956	119	

For both Case "2006 Base" and "2006 Mod", the average annual volume discharged through S-155A would be roughly 26% of historic; the average annual TP load discharged through S-155A would be roughly 23% of historic. The bulk of that differential is associated with the assumed elimination of Lake Okeechobee regulatory releases and regulatory releases from the LNWR through S-5AS and S-5AE.

4. 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.

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). Those inflows are considered limited to:

- Basin runoff from the S-2/S-6 Basin;
- Basin runoff from the East Shore Water Control District/715 Farms Chapter 298 districts (ESWCD/715) diverted from Lake Okeechobee;
- 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. For this analysis, 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 2006 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 2006 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.

A summary of the estimated average annual inflows to STA-2 is presented in Table 4.1.

Table 4.1 Estimated Inflows to STA-2

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
S-2/S-6 Basin	226,654	27,015	97	Deliverable 1.5.2, Table 3.2
ESWCD/715	29,818	4,588	125	Deliverable 1.5.2, Table 2.6
S-5A Basin	59,342	11,260	154	Deliverable 1.5.2, Table 3.12
Seepage from WCA-2	27,500	509	15	See text
Lake Okeechobee	461	48	85	Deliverable 1.1.2 Table 5.1 (WL2351) with Conc from Deliverable 1.5.2, Table 6.7
Total Inflow	343,775	43,420	102	
Assumed Bypass	461	48	85	Water Supply to LEC SA2 (WL2351)
Inflow to be Treated	**343,314**	**43,372**	**102**	

4.1. Cases Considered in DMSTA2 Analysis of STA-2

A total of two potential cases were considered in the DMSTA2 analysis of STA-2. The two cases considered are described as follows; each case used the inflow time series summarized in Table 4.1.

- **Exist:** This case was developed upon the assumption that the inflows to STA-2 are to be treated in the existing footprint of STA-2 (e.g., excludes consideration of the influence of the Cell 4 expansion to STA-2). This case was included in the analysis

for reference only, as its inclusion permits an assessment of the impact of the addition of Cell 4. In addition, its inclusion permits an at least approximate comparison to the historic operation of STA-2.

- **2006 Base:** This case varies from "Exist" only in that Cell 4 is considered complete and inflows to STA-2 are redistributed accordingly. Cell 4 was considered as developed in Submerged Aquatic Vegetation (SAV_3). Dimensional information on Cell 4 was taken from the BODR for STA-2 Cell 4. No other modifications to the existing cells of STA-2 were considered in the analysis.

4.2. Summary of DMSTA2 Results

Table 4.2 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 4.2 Summary of DMSTA2 Analyses, STA-2, WY 1966-2000

Parameter	Units	Summary of Results by Case	
		Exist	2006 Base
Average Annual Inflow			
Volume	1,000 ac-ft	343.6	343.6
TP Load	metric tons	43.32	43.32
FWM TP Concentration	ppb	102	102
Average Annual Outflow			
Volume	1,000 ac-ft	346.7	347.5
FWM TP Concentration			
Upper Confidence Limit	ppb	22.5	17.1
Mean Estimate	ppb	27.8	21.0
Lower Confidence Limit	ppb	33.8	25.7
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	15.9	11.2
Mean Estimate	ppb	21.1	15.0
Lower Confidence Limit	ppb	27.2	19.7
TP Load (Using Mean FWM Conc.)	metric tons	11.87	8.90
For Detailed Results, See Appendix A		Table A.9	Table A.10
Summary of Bypasses and Diversions			
Water Supply to LEC			
Volume	1,000 ac-ft	0.5	0.5
TP Load	metric tons	0.04	0.04
FWM TP Concentration	ppb	85	85

Based on the above tabulation, the addition of Cell 4 is projected to reduce mean TP loads in discharges from STA-2 by approximately 25% (as compared to the existing STA-2).

4.2.1. Comparison to Historic Operation

An evaluation of the historic performance to date of STA-2 in reducing total phosphorus loads and concentrations was presented in Table 2.5 of the Supplemental Analysis for Water Years 2002-2004. Given the disparity in period of analysis and inflow time series considered in the Supplemental Analysis to that presented above for Case "Exist:", a direct comparison is not possible.

However, it is noted that the estimated average annual inflow TP loads in Table 4.2 (43.32 metric tons per year) are approximately 92% greater than those summarized in Table 2.5 of the Supplemental Analysis (22.58 metric tons per year). The reduction in TP loads in STA-2 from the above Table 4.2 is 79.5%. The reduction in TP loads in STA-2 from Table 2.5 of the Supplemental Analysis was estimated to be 75.4%.

Employing the simplified, steady-state form of analysis presented in the Supplemental Analysis with the average annual inflow data presented in the above Table 4.1 (using 3 CSTRs in series and a mean steady-state settling rate of 28.4 m/yr), the projected flow-weighted mean TP concentration in discharges from STA-2 would be 28.8 ppb, which compares reasonably well to the mean estimate of 27.8 ppb summarized in Table 4.2 for Case "Exist". It is concluded from this approximate comparison that the DMSTA2 results for existing STA-2 are reasonably consistent with the historic performance of STA-2 summarized in the Supplemental Analysis.

5. STA-3/4

For this analysis, all enhancements to STA-3/4 recommended in the Long-Term Plan are considered complete, with but one exception. Cell 1B of STA-3/4 (originally scheduled for conversion to SAV) is considered for this analysis to perform as pre-existing vegetation (PEW_3), as the District is seeking FDEP approval for a modification of the Long-Term Plan to defer conversion of this well-performing cell. This cell comprises the former Terrytown Wildlife Management Area, and has been out of agricultural production since the early 1990's. 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) and G-372 (on the Miami Canal). 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.

In development of the SFWMM 2006 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 2006 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 5.1.

Table 5.1 Estimated Inflows to STA-3/4

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
S-2/S-7 Basin	226,012	22,334	80	Deliverable 1.5.2, Table 3.4
S-3/S-8 Basin	232,712	23,617	82	Deliverable 1.5.2, Table 3.8
SSDD	10,559	1,390	107	Deliverable 1.5.2, Table 2.9
SFCD	21,145	3,183	122	Deliverable 1.5.2, Table 2.12
C-139 Basin (G-136)	13,204	2,958	182	Deliverable 1.5.2, Table 4.3
Lake Reg. Release at S-351	61,600	5,539	73	Deliverable 1.5.2, Table 6.10
Lake Reg. Release at S-354	77,386	5,902	62	Deliverable 1.5.2, Table 6.12
Lake WS Release at S-351	14,060	1,475	85	Deliverable 1.5.2, Table 6.7, less WL2351
Lake WS Release at S-354	36,624	3,255	74	Deliverable 1.5.2, Table 6.9
Total Inflow	693,302	69,653	81	
Assumed Bypass	50,684	4,730	76	Water Supply to LEC and Big Cypress Reservation
Inflow to be Treated	**642,618**	**64,923**	**82**	

5.1. Cases Considered in DMSTA2 Analysis of STA-3/4

A total of two potential cases were considered in the DMSTA2 analysis of STA-3/4. The two cases considered are described as follows; each case used the inflow time series summarized in Table 5.1.

- **2006 Base:** This case was developed upon the assumption that the inflows to STA-3/4 would be distributed to the three parallel flow paths in such a fashion as to result in essentially equal flow-weighted mean outflow concentrations.

- **2006 Split:** This case varies from "2006 Base" only in that inflows to STA-3/4 from the North New River Canal are assigned to Cells 1A and 1B (Case **ST3_06Base**), and inflows to STA-3/4 from the Miami Canal are assigned to cells 2A, 2B, 3A, and 3B (**Case ST4_06 Base**).

5.2. Summary of DMSTA2 Results

Table 5.2 presents a summary of the results of the DMSTA2 analyses for STA-3/4. Summary DMSTA2 input and output data for each case are included in Appendix A.

Table 5.2 Summary of DMSTA2 Analyses, STA-3/4, WY 1966-2000

Parameter	Units	Summary of Results by Case		
			2006 Split	
		2006 Base	ST3_06Base	ST4_06Base
Average Annual Inflow				
Volume	1,000 ac-ft	643.1	287.8	355.3
TP Load	metric tons	64.94	27.89	37.04
FWM TP Concentration	ppb	82	79	85
Total for Case				
Volume	1,000 ac-ft	643.1	643.1	
TP Load	metric tons	64.94	64.94	
FWM TP Concentration	ppb	82	82	
Average Annual Outflow				
Volume	1,000 ac-ft	624.2	279.7	344.1
FWM TP Concentration				
Upper Confidence Limit	ppb	16.2	19.9	15.1
Mean Estimate	ppb	20.1	25.3	18.2
Lower Confidence Limit	ppb	24.8	31.4	22.1
Geometric Mean TP Conc.				
Upper Confidence Limit	ppb	11.9	16.0	10.3
Mean Estimate	ppb	15.6	21.2	13.2
Lower Confidence Limit	ppb	20.1	27.3	16.8
TP Load (Using Mean FWM Conc.)	metric tons	15.46	8.72	7.74
For Detailed Results, See Appendix A		Table A.13	Table A.11	Table A.12
Total For Case				
Volume	1,000 ac-ft	624.2	623.8	
Flow-Weighted Mean TP Concentration				
Upper Confidence Limit	ppb	16.2	17.3	
Mean Estimate	ppb	20.1	21.4	
Lower Confidence Limit	ppb	24.8	26.3	
TP Load (Using Mean FWM Conc.)	metric tons	15.46	16.46	
Summary of Bypasses and Diversions				
Water Supply Bypass				
Volume	1,000 ac-ft	50.7	50.7	
TP Load	metric tons	4.73	4.73	
FWM TP Concentration	ppb	76	76	

From the above, it would appear desirable to attempt to balance the overall inflows to STA-3/4 to redistribute a part of the inflow from the North New River Canal through Structure G-383 to the two westerly flow paths. A part of that need results from the assumed continuation of Cell 1B as "PEW_3", in lieu of conversion to SAV.

6. 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 all analyses applicable to the period 2006-2009. Analyses discussed herein also consider the historic operation of STA-5 over Water Years 2002-2005 in an attempt to bench mark the performance to date of STA-5.

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. 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. For analysis of historic operations, measured inflow concentrations were used without reduction; inflows to STA-5 were reduced by historic bypass volumes through Structure G-406.

6.1. Cases Considered in DMSTA2 Analysis of STA-5

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

- **2006 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 BODR for STA-5 was generally silent on the amount of effective treatment area that would be added in the third flow-way. It was assumed for this analysis that the westerly part of the third flow path would be ineffective for treatment, similar to that for the two existing flow paths. In addition, the separation between Cells 3A and 3B was assigned at the location shown in the BODR, which is further east than the separation in the two existing flow paths. New Cell 3A (1,140 acres) was considered

as emergent vegetation (EMG_3); New Cell 3B (917 acres) was considered as submerged aquatic vegetation (SAV_3).

- **2006 Base Emg:** This case is identical to "2006 Base" with the single exception that the downstream cells (1B, 2B, and 3B) were assigned the EMG_3 calibration data set in lieu of SAV_3;

- **Exist:** This case was structured to parallel as closely as practicable the historic operation of STA-5 over the period Water Years 2002-2005. Total inflows from the C-139 Basin to STA-5 were reduced to reflect those discharges bypassed at G-406. TP concentrations in the inflows were not reduced from historic. Cell 1B was analyzed as Submerged Aquatic Vegetation (SAV_3), with the other three cells analyzed as Emergent vegetation (EMG_3). As shown in the DMSTA2 results summarized below, the flow-weighted mean inflow concentration to Cell 1B was estimated to fall essentially equal to the upper end of the calibration range for SAV_3 (153 ppb), leading to inclusion of the following case in the analysis.

- **Exist All Emerg:** This case varied from Case "Exist" only in that Cell 1B was analyzed as for Emergent vegetation (EMG_3) in lieu of SAV.

As outlined above, Cases "2006 Base" and "2006 Base Emg" assumed no bypass from STA-5 to STA-6. This assumption may require additional analysis in the future, as the maximum mean daily inflow in the record for Water Years 1995-2005 was 1,575 cfs (525 cfs per flow path), somewhat in excess of the maximum measured mean daily inflow to Cells 1A and 2A (434 cfs each) over Water Years 2002-2005. Should bypass be experienced, the net result would be a reduction in the estimated TP concentrations and loads discharged from STA-5, with a concurrent increase in the estimated TP concentrations and loads discharged from STA-6.

6.2. Summary of DMSTA2 Results

Table 6.1 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

"2006 Base" and "2006 Base Emg" is for the entire period Water Years 1995-2005; data for cases "Exist" and "Exist Emerg" are limited to Water Years 2002-2005.

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 6.1 Summary of DMSTA2 Analyses, STA-5

Parameter	Units	Summary of Results by Case			
		Exist	Exist All Emerg	2006 Base	2006 Base Emg
Effective Treatment Area	acres	4,110	4,110	6,167	6,167
Average Annual Inflow					
Volume	1,000 ac-ft	150.6	150.6	159.1	159.1
TP Load	metric tons	45.09	45.09	39.14	39.14
FWM TP Concentration	ppb	243	243	199	199
Average Annual Outflow					
Volume	1,000 ac-ft	150.5	150.5	149.7	149.7
FWM TP Concentration					
Upper Confidence Limit	ppb	51.6	74.9	16.7	41.9
Mean Estimate	ppb	66.5	94.3	22.1	57.2
Lower Confidence Limit	ppb	82.1	113.1	29.6	74.3
Geometric Mean TP Conc.					
Upper Confidence Limit	ppb	47.7	70.8	11.2	35.9
Mean Estimate	ppb	62.3	89.8	16.2	50.5
Lower Confidence Limit	ppb	77.5	108.0	23.2	66.7
TP Load (Using Mean FWM Conc.)	metric tons	12.34	17.52	4.08	10.56
For Detailed Results, See Appendix A		Table A.14	Table A.15	Table A.16	Table A.17
Summary of Bypasses and Diversions					
Bypass at G-406					
Volume	1,000 ac-ft	32.6	32.6	0.0	0.0
TP Load	metric tons	13.39	13.39	0.00	0.00
FWM TP Concentration	ppb	333	333	---	---

Over the period Water Years 2002-2005, the measured flow-weighted mean TP concentration in discharges from STA-5 was approximately 99 ppb, closely paralleling the mean flow-weighted TP concentration estimated for Case "Exist All Emerg", suggesting that the relatively high inflow concentrations to Cell 1B have influenced the performance of the vegetation in that cell. For the case "2006 Base", the addition of the third flow-way and resulting reduction of loads applied to the existing flow paths in STA-5, coupled with the District's ongoing efforts to address flow distribution and enhancement of the existing STA-5, provides a degree of assurance that the downstream cells of the expanded STA may be forecast to perform more as SAV_3 than has historically been the case. However, until such 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 three downstream cells (e.g., range from upper limit of performance for SAV_3 to the lower limit of performance for EMG_3).

7. STA-6

For analysis of the period 2006-2009, STA-6 is considered to have been expanded to include STA-6 Section 2. The general configuration of Section 2 has been taken from the BODR for STA-6 Section 2; although not stated expressly in the BODR, it has been assumed for this analysis that Section 2 will be developed in Submerged Aquatic Vegetation. 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.

Sources of inflow to STA-6 include the following:

- Runoff from the former U.S. Sugar Corporation's Southern Division Ranch, Unit 2. For the period 2006-2009, historic discharges from that area have been reduced 20% to reflect the conversion of certain lands in Unit 2 to use in STA-6 Section 2 and the third flow-way at STA-5;

- Runoff from the C-139 Annex;

- Bypass at G-406 of C-139 Basin runoff exceeding the inflow capacity of the G-342 inflow control structures at STA-5. As discussed earlier for STA-5, this analysis has assumed no bypass of C-139 Basin runoff to STA-6.

A summary of the estimated average annual inflows to STA-6 during the period 2006-2009 is presented in Table 7.1. Average annual inflows from Unit 2 are based on record data over the period Water Years 1998-2005, reduced by 20% as stated above. Average annual inflows from the C-139 Annex are based on record data from the C-139 Annex (as measured at station "USSO") over the period Water Years 1997-2005.

Table 7.1 Estimated Inflows to STA-6

Source	Estimated Average Annual Inflow			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
USSC SDR Unit 1 (WY 1998-2005)	38,400	3,447	74	Deliverable 1.5.2, Table 4.6
C-139 Annex (WY 1997-2005)	40,176	4,873	98	Deliverable 1.5.2, Table 4.5
Total Inflow	78,576	8,320	86	
Assumed Bypass	0	0	---	No bypass assumed
Inflow to be Treated	**78,576**	**8,320**	**86**	

7.1. Cases Considered in DMSTA2 Analysis of STA-6

A total of five potential cases were considered in the DMSTA2 analysis of STA-6. The five cases considered are described below. Two cases (SEC1_SDR and HIST_SAV) were included in the analysis for comparison to the historic performance of STA-6 Section 1. Two cases (Sect1 _USSO and Sect1_USSO_SAV) are more generally applicable to the period after 2009, but were included herein primarily as a matter of interest. The fifth case (2006 Base) is considered the case directly applicable to anticipated inflows and operations during the period 2006-2009.

- **SEC1_SDR:** This analysis was intended to parallel as closely as practicable the actual performance of STA-6 Section 1 over the period Water Years 2001-2004. Inflows from the USSC Southern Division Ranch Unit 2 were assigned at recorded values (e.g., not reduced to reflect the future conversion of lands to use in STA-6 Section 2 and the third flow-way at STA-5). Vegetation in STA-6 Section 1 was analyzed as pre-existing wetland vegetation (PEW_3). The results of this analysis appeared to over-predict the flow-weighted mean TP concentration in discharges from STA-6 Section 1, leading to inclusion of the following case in the analysis;

- **HIST_SAV:** This case was developed identical to Case "SEC1_SDR", with the lone variation being the vegetation was assumed to act as Submerged Aquatic Vegetation (SAV_3);

- **2006 Base:** This case was developed to reflect the anticipated treatment area configuration and operation expected to exist over the period 2006-2009. The analysis extends over the period Water Years 1998-2005 (no data for the Southern Division Ranch was available in Water Year 1997). For this analysis, the vegetation in Section 1 (Cells 3

and 5) was assigned as pre-existing wetland vegetation (PEW_3); the vegetation in Section 2 was assigned as SAV_3.

- **Sect1_USSO:** This case was developed for potential applicability post-2009, and 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);

- **Sect1_USSO_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.

7.2. Summary of DMSTA2 Results

Table 7.2 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 7.2 Summary of DMSTA2 Analyses, STA-6

Parameter	Units	Summary of Results by Case				
		SEC1_SDR	HIST_SAV	2006 Base	Sect1_USSO	Sec1_USSO_SAV
Effective Treatment Area	acres	897	897	2,197	897	897
Average Annual Inflow						
Volume	1,000 ac-ft	50.5	50.5	78.6	40.2	40.2
TP Load	metric tons	5.06	5.06	8.30	4.88	4.88
FWM TP Concentration	ppb	81	81	86	98	98
Average Annual Outflow						
Volume	1,000 ac-ft	44.3	44.3	70.7	34.1	34.1
FWM TP Concentration						
Upper Confidence Limit	ppb	22.1	16.4	11.8	19.4	14.1
Mean Estimate	ppb	27.7	19.5	14.3	25.1	17.0
Lower Confidence Limit	ppb	34.0	23.3	17.6	32.0	20.6
Geometric Mean TP Conc.						
Upper Confidence Limit	ppb	17.5	12.1	7.7	15.5	10.3
Mean Estimate	ppb	22.7	15.1	10.3	21.2	13.1
Lower Confidence Limit	ppb	28.4	18.6	13.7	28.0	16.7
TP Load (Using Mean FWM Conc.)	metric tons	1.52	1.07	1.25	1.05	0.71
For Detailed Results, See Appendix A		Table A.18	Table A.19	Table A.20	Table A.21	Table A.22

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.

Table 2.11 of the Supplemental Analysis summarizes the historic performance of STA-6 Section 1 over the period Water Years 2001-2004, and may be considered to somewhat

parallel the above DMSTA2 analyses for "SEC1_SDR" and "HIST_SAV". As developed in the Supplemental Analysis, the estimated flow-weighted mean TP concentration in discharges from STA-6 Section 1 over that period was 21 ppb, falling intermediate to the mean flow-weighted estimates presented in Table 7.2 for that same period, but falling closer to that resulting from an assumption that the vegetation in Section 1 acts as "SAV_3".

That result is consistent with observations made by Walker. It is possible that the inflow time series from the Southern Division Ranch (based on historical records) overestimates the inflows to STA-6 at G-600, as the recorded flows at G-600 do not reflect (unrecorded) irrigation withdrawals from the tailwater of G-600 (which would act to reduce the actual inflows to STA-6). Walker reports his simulations of STA-6 using the PEW_3 calibration also over-estimated the observed outflow concentrations by approximately 15%. The results of the DMSTA2 simulations would place the historic flow-weighted mean TP concentration in outflows from STA-6 within the range of estimates for both PEW_3 (historic concentration approaching the upper confidence limit) and SAV_3 (historic concentrations approaching the lower confidence limit).

8. SUMMARY PROJECTIONS

A summary of the projected performance of the various stormwater treatment areas over the period 2006-2009 is presented in Table 8.1. 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 8.1 for STA-5 include the full range of uncertainty associated with the performance of the three downstream cells.

Table 8.1 Summary Projections for all STAs, for Period 2006-2009

Parameter	Units	Summary of DMSTA2 Results by Treatment Area and Case						
		STA-1W	STA-1E	STA-2	STA-3/4	STA-5*	STA-6	
		2006 Mod	2006 Mod	2006 Base	2006 Base	2006 Base	2006 Base	All
Effective Treatment Area	acres	6,670	6,175	8,140	16,543	6,167	2,197	45,892
Average Annual Inflow								
Volume	1,000 ac-ft	175.1	242.9	343.6	643.1	159.1	78.6	1642.4
TP Load	metric tons	37.7	41.16	43.3	64.94	39.14	8.30	234.52
FWM TP Concentration	ppb	174.3	137	102	82	199	86	116
Average Annual Outflow								
Volume	1,000 ac-ft	176.7	240.9	347.5	624.2	149.7	70.7	1609.7
FWM TP Concentration								
Upper Confidence Limit	ppb	16.7	19.3	17.1	16.2	16.7	11.8	16.8
Mean Estimate	ppb	20.3	25.2	21.0	20.1	39.7	14.3	22.6
Lower Confidence Limit	ppb	25.2	32.3	25.7	24.8	113.1	17.6	34.1
Geometric Mean TP Conc.								
Upper Confidence Limit	ppb	9.8	---	11.2	11.9	11.2	7.7	---
Mean Estimate	ppb	13.5	---	15.0	15.6	33.4	10.3	---
Lower Confidence Limit	ppb	18.5	---	19.7	20.1	66.7	13.7	---
TP Load (Using Mean FWM Conc.)	metric tons	4.43	7.48	8.90	15.46	7.3	1.25	44.84
Summary of Bypass Volumes and Loads								
Bypass Volume, TP Load and TP Concentration for each Treatment Area								
Volume	1,000 ac-ft	16.7	71.5	0.5	50.7	0.0	0.0	139.4
TP Load	metric tons	2.47	9.41	0.04	4.73	0.00	0.00	16.64
FWM TP Concentration	ppb	120	107	66	76	---	---	97

* At STA-5, upper confidence limit reported based on the assumption that the three downstream cells act as SAV_3; lower confidence limit reported based on the assumption that the three downstream cells act as EMG_3. Mean estimate of outflow concentration and outflow TP load taken as average of those two conditions

In the above table, bypasses at STA-1E are untreated bypass through S-155A. All other bypasses indicated in Table 8.1 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 8.

The total inflow volume shown in Table 8.1 varies from that reported in Table 7.1 of Deliverable 1.5.2 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;

- At STA-1E, the westerly flow path was analyzed separately from the easterly two flow paths. Seepage lost from the West Distribution Cell to the C-51 West Canal was added to the projected inflows to the easterly two flow paths – total outflow volumes from STA-1E were not affected by that assignment.

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 2006 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 8.2 summarizes estimated average annual back pumping or back flow to Lake Okeechobee during the period 2006-2009.

Table 8.2 Estimated Back Pumping to Lake Okeechobee

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)	42,554	4,640	88	Deliverable 1.5.2, Table 3.6
S-3 (S-3/S-8)	5,921	594	81	Deliverable 1.5.2, Table 3.9
C-10A (L-8)	49,905	6,474	105	Deliverable 1.5.2, Table 5.4
Total Discharge	98,380	11,708	96	

8.1. Sensitivity of Projections to Assumption of Water Supply Bypass

As noted throughout this document, the water quality analyses summarized in Table 8.1 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 2006-2009, this assumption is of particular significance only at STA-3/4 and at the STA-1 complex. Additional DMSTA2 simulations were conducted to assess the impact of inclusion of those water supply releases in the inflows to the STAs.

8.1.1. STA-3/4

As summarized in Table 8.1, an average annual volume of just less than 51,000 acre-feet per year (at a flow-weighted mean TP concentration of 76 ppb) was assumed to bypass STA-3/4. The STA-3/4 simulation summarized in Table 8.1 was modified to include those water supply releases in the inflows to STA-3/4. Detailed output from that DMSTA2 simulation (Case "2006 WS") is presented in Appendix A (Table A.23).

Inclusion of those water supply releases in the inflows to STA-3/4 would act to increase the average annual inflow volume by 7.8%, and the average annual inflow load by 7.4%, as compared to the "2006 Base" case for STA-3/4. The estimated flow-weighted mean TP concentration in the outflows from STA-3/4 is estimated to increase from 20.1 ppb to 20.3 ppb (using the mean estimate); the average annual TP load in the outflows from STA-3/4 is estimated to increase from 15.46 metric tons per year to 16.88 metric tons per year (an increase of 9.2%). Overall TP loads (including both treated and bypass flows) would reduce from 20.19 metric tons per year for the "2006 Base" simulation (for which bypasses are assumed) to 16.88 metric tons per year for the "2006 WS" simulation (which has no bypass).

8.1.2. STA-1W

As summarized in Table 8.1, an average annual volume of just less than 17,000 acre-feet per year (at a flow-weighted mean TP concentration of 120 ppb) was assumed to bypass STA-1W and STA-1E. Of that total, slightly more than 3,600 acre-feet were simulated water supply releases directed to the LNWR, with the balance consisting of water supply releases directed to the L-8 Borrow Canal (for which no need for treatment is assumed). Inspection of data summarized in Tables 2.2 (for STA-1W) and 3.2 (for Cells 5-7 of STA-1E) for Case "2006 Mod" indicates that the projected outflow concentrations from the westerly flow path of STA-1E are consistently above those projected at STA-1W. The STA-1W simulation summarized in Table 8.1 was modified to include Lower East Coast water supply releases in the inflows to STA-1W. Detailed output from that DMSTA2 simulation (Case "2006 WS") is presented in Appendix A (Table A.24).

Inclusion of those water supply releases in the inflows to STA-1W would act to increase the average annual inflow volume by 2.1%, and the average annual inflow load by 1.3%,

as compared to the "2006 Mod" case for STA-1W. The estimated flow-weighted mean TP concentration in the outflows from STA-1W is estimated to increase from 20.3 ppb to 20.5 ppb (using the mean estimate); the average annual TP load in the outflows from STA-1W is estimated to increase from 4.43 metric tons per year to 4.56 metric tons per year (an increase of 2.9%). Overall TP loads (including both treated and bypass flows) would reduce from 4.96 metric tons per year for the "2006 Mod" simulation (for which bypasses are assumed) to 4.56 metric tons per year for the "2006 WS" simulation (which has no bypass).

It is possible that, should the revised inflows reflected in the "2006 Mod" simulations for STA-1W and STA-1E be implemented, the volume of water supply release to the LNWR would increase by some (presently not quantifiable) amount, as the total discharge from STA-1W and STA-1E to the Refuge would reduce from an estimated average annual volume of 484 thousand acre feet per year (as for cases "2006 All") to 418 thousand acre feet per year. Accordingly, the actual impact of introducing those water supply releases to STA-1W for treatment could exceed that discussed above.

8.2. Additional Analyses for STA-1E

Review of the summary data presented in Table 8.1 leads to the observation that, with the exception of STA-5 (for which uncertainty in the performance of the SAV community in the downstream cell of each flow path leads to a wide range of potential performance), the highest estimated flow-weighted mean TP concentrations in treatment area outflows occur at STA-1E. Estimated outflow concentrations at this STA are roughly 20% greater than those estimated for the other treatment areas (again excluding STA-5). Given that result, and the presence of a means to further reduce the inflow volumes and TP loads to STA-1E (through increased bypass to the C-51 East Canal at S-155A), it is considered appropriate to consider the impact of an increased bypass through S-155A on estimated outflow concentrations from STA-1E.

In addition, the analyses summarized in Table 8.1 were developed upon the assumption that the full area of STA-1E is available for use. However, during much of the period 2006-2009,

it is anticipated that use of Cells 1 and 2 will be curtailed due to the construction and operation of a Periphyton Assisted Stormwater Treatment Area (PSTA) demonstration project in Cell 2 being designed and constructed by the Jacksonville District, U.S. Army Corps of Engineers.

Additional analyses of STA-1E were conducted to assess the potential influence on treatment performance that would result from consideration of both of the above modifying conditions.

8.2.1. Influence of PSTA Demonstration Project

The most recent information on the basic character and design of the PSTA demonstration project in Cells 1 and 2 was taken from the June 28, 2005, *(Draft) Design Analysis Report for the STA-1E Cells 1-2 PSTA/SAV Field Scale Demonstration Project*. A draft water control and operations plan for that project is being prepared, but was not available for consideration at the time of this analysis.

The apparent maximum design rate of discharge through Cells 1 and 2 during operation of the PSTA/SAV demonstration project, taken from the *Design Analysis Report*, is 55.32 cfs. In comparison, the maximum design rate of discharge through Cells 1 and 2 considered in the original design of STA-1E was 860 cfs. In the absence of a water control and operations plan for the demonstration project, it is not possible to project a time series of inflows to Cells 1 and 2 of STA-1E. Analysis of the projected treatment performance of STA-1E, given the presence of the demonstration project, was conducted upon the assumption that Cells 1 and 2 are off line and unavailable for use. This assumption is conservative in nature, but does permit the maximum flexibility in actual operation of the demonstration project to achieve its objectives. Any beneficial result from the direction of STA-1E inflows through Cells 1 and 2 would serve to modify (improve) the projections summarized herein.

The DMSTA2 input file for STA-1E "2006 Mod", Cells 1-4 (see Table 3.2) was selected as the base condition for analysis of the impact of the Cells 1-2 PSTA/SAV Demonstration Project. The input data for that case was modified to:

- Eliminate Cells 1 and 2;

- Direct all inflows to STA-1E at Pump Station S-319 through Cells 3-4S (including the west half of the East Distribution Cell), limited only by the original maximum design rate of discharge through those cells (1,540 cfs).

The inflow fraction to Cells 3-4S was assigned at 100% of the discharge at S-319, with bypass of all discharges above 1,540 cfs. Those bypassed volumes are considered released to the C-51 East Canal at S-155A, in essence adding to the bypass volumes originally considered for Case "2006 Mod". Detailed DMSTA2 input and output data for this new case at STA-1E (Case "3_4 2006PSTA") are presented in Table A.25 of Appendix A. Estimated flow-weighted mean outflow concentrations from Cells 3-4S are roughly 50% greater than for Case "2006 Mod" in Cells 1-4S (mean estimate of the long-term flow-weighted mean TP concentration in discharges from Cells 3-4S are projected to increase from 24.3 ppb to 37.1 ppb).

It is estimated that it would be possible to pass virtually the entire inflow at S-319 through Cells 3-4S, despite the disparity between the design capacity of S-319 (3,980 cfs) and the design capacity of the S-366 inflow control structures to Cell 3 (1,540 cfs). In the ECP 2006 SFWMM simulation, the maximum daily inflow (summation of C-51 West Basin and Acme Improvement District, Basin B runoff) over Water Years 1966-2000 is shown as 1,714 cfs, suggesting that the capacity of S-319 greatly exceeds that necessary to accommodate runoff from those two sources. The combined area of the C-51 West Basin and Acme Improvement District, Basin B is approximately 53,100 acres. The 3,980-cfs capacity of S-319 is equivalent to a removal rate of 1.78 inches per day from that tributary area. The maximum simulated inflow rate of 1,714 cfs is equivalent to a removal rate of 0.77 inches per day from that tributary area. The maximum daily simulated runoff from the 44,400-acre C-51 West Basin is 1,435 cfs (0.77 inches per day).

The results of Case "3_4 200PSTA" in Cells 3-4S must be considered with some caution due to the relatively low simulated daily removal rate from the C-51 West Basin. It is possible that actual daily removal rates may be higher than reflected in the simulation, with the result that a limitation on inflow rates to Cell 3 based on its hydraulic capacity could increase bypass volumes at S-155A to greater extent than the results of this analysis would suggest.

8.2.2. Analysis for Increased Bypass at S-155A

As summarized in Table 8.1, the estimated average annual volume of bypass at S-155A for Case "2006 Mod" at STA-1E is roughly 71,500 acre-feet per year, established equal to the simulated inflows to the C-51 West Canal resulting from L-8 Basin runoff. However, Section 7.11 "L-8 Basin- Interim Operations" of the *(Draft) Stormwater Treatment Area 1-East (STA-1E) Water Control Plan* provides that:

1. *Primary outlets are Lake Okeechobee and the Refuge, however, in order to minimize the discharge of untreated water to the Refuge, the operation of the S-5A structures, G-311, S-319, and S-155A will be coordinated in order to either treat L-8 runoff in STA-1E or discharge to the east to the maximum extent practical based on available capacity.*

2. *To ensure the STA-1E is not overloaded, until the L-8 Basin runoff is diverted north into the proposed CERP project, the operation of the S-155A divide will be synchronized with S-5AE and S-319 to pass at least the same volume of stormwater to tide as L-8 presently discharges to C-51 (approaching 150,000 AF/yr). Water passing through S-155A will be a mixture of L-8 and C-51W basin runoff.*

The DMSTA2 analysis described above for Case "3_4 2006PSTA" was modified to increase the volume bypassed at S-155A for consistency with the above provisions of the *(Draft) Water Control Plan*. The target average annual bypass at S-155A is considered to consist of:

- The currently simulated bypass of approximately 71,500 acre-feet per year;

- An allowance of approximately 6,000 acre-feet per year for seepage inflows to the C-51 West Canal not considered in the analysis for Case "3_4 2006PSTA";

- An additional bypass of approximately 72,500 acre-feet per year through S-155A.

The additional bypass at S-155A was "forced" in the simulation by limiting inflows to STA-1E at S-319 to 55% of the combined volume of runoff from the C-51 West Basin and Acme Improvement District, Basin B. Detailed DMSTA2 input and output data for this case are included as Table A.26 in Appendix A.

A summary of the overall projected outflows from STA-1E for a modified, interim operation to reflect both the impact of the PSTA/SAV Demonstration project in Cells 1 and 2 and the potential for increased bypasses through S-155A (within the limits defined in the *(Draft) Water Control Plan* for STA-1E is presented in Table 8.3. Inflows to Cells 5-7 would be identical to those for Case "5_7 2006 Mod"; inflows to Cells 3-4S are taken from "3_4 PSTADiv".

It is possible that, should the revised inflows reflected in Table 8.3 STA-1E be implemented, the volume of water supply release to the LNWR would increase by some (presently not quantifiable) amount, as the total discharge from STA-1W and STA-1E to the Refuge would reduce from an estimated average annual volume of 484 thousand acre feet per year (as simulated in the ECP 2006 SFWMM simulation) to 333 thousand acre feet per year. That reduction could trigger the need for additional water supply releases to STA-1W and STA-1E, impacting treatment projections to the extent those additional water supply releases might first be introduced to the STAs for treatment.

Table 8.3 Modified Interim Operations at STA-1E

Parameter	Units	Summary of Results by Case	
		2006 Mod	
		3_4 PSTADiv	5_7 2006 Mod
Average Annual Inflow			
Volume	1,000 ac-ft	88.7	75.1
TP Load	metric tons	13.23	16.14
FWM TP Concentration	ppb	121	174
Total for Case			
Volume	1,000 ac-ft	163.8	
TP Load	metric tons	29.37	
FWM TP Concentration	ppb	145	
Average Annual Outflow			
Volume	1,000 ac-ft	84.6	71.6
FWM TP Concentration			
Upper Confidence Limit	ppb	12.8	21.5
Mean Estimate	ppb	17.0	27.2
Lower Confidence Limit	ppb	22.6	34.9
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	9.4	12.3
Mean Estimate	ppb	13.5	17.5
Lower Confidence Limit	ppb	18.9	24.5
TP Load (Using Mean FWM Conc.)	metric tons	1.78	2.41
For Detailed Results, See Appendix A		Table A.26	Table A.8
Total For Case			
Volume	1,000 ac-ft	156.2	
Flow-Weighted Mean TP Concentration			
Upper Confidence Limit	ppb	15.4	
Mean Estimate	ppb	20.0	
Lower Confidence Limit	ppb	26.3	
TP Load (Using Mean FWM Conc.)	metric tons	4.18	

9. PRINCIPAL CONCLUSIONS

Review of the summary projections presented in Table 8.1 suggests that, for conditions expected to prevail over the period 2006-2009, there would be little value in attempting to redistribute the inflow volumes and TP loads to the various STAs, with one exception. That exception is for the combined operation of STA-1W and STA-1E. It would appear desirable to redistribute volumes and loads discharged from the STA-1 Inflow and Distribution Works, reducing the proportion delivered to STA-1W and increasing the proportion delivered to STA-1E, so that projected outflow concentrations from those two treatment areas are more closely in parallel. However, that redistribution, in and of itself, would not materially change the aggregate of total phosphorus loads delivered to the Loxahatchee National Wildlife Refuge (LNWR).

However, the volumes and TP loads discharged to the LNWR are materially influenced by the assumption that volumes associated with L-8 Basin runoff will bypass both STA-1W and STA-1E, being delivered first through S-5AE to the C-51 West Canal and then discharged at Structure S-155A. It is not apparent that sufficient hydraulic capacity presently exists in the water control structures to effect that assumption. It would appear desirable that, under Phase 1, Task 3 of District Contract No. CN040912-WO03, the potential need for increasing the capacity of S-5AE (and, potentially, S-155A) prior to the end of 2006 be evaluated in detail.

An interim operation of STA-1E, in which Cells 1 and 2 are considered to be off line due to the construction and operation of the PSTA/SAV Demonstration Project by the Jacksonville District, U.S. Army Corps of Engineers, coupled with an increased bypass through S-155A, could be expected to:

- Reduce overall TP loads discharged to the LNWR;

- Result in a relatively close balance in the estimated TP concentrations in outflows from STA-1E and STA-1W;

- Increase (as compared the data summarized in Table 8.1) volumes and TP loads bypassed to the C-51 East Canal through S-155A, but within the constraints permitted by the *(Draft) Water Control Plan* for STA-1E.

That interim operation could be considered to further delay realization of the full flood control benefits of the Central and Southern Florida Flood Control Project in the C-51 Basin, and would require additional analysis of the capacity and operations of S-155A.

* * * * *

Appendix A
DMSTA2 Output Data
List of Tables

Table A.1 STA-1W: Case "2006 All"

DMSTA2- Inputs & Outputs **Project: PROJECT_STA1W** Model Release: 7/1/2005 Current Date: 08/03/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2006_All	STA-1W with Long Term Plan Enhancements
Input Series Name	-	TS_2006All	Inflows Include all S-5A Basin and EBWCD Runoff from ECP 2006 Simulation (no diversion to STA-1E)
Starting Date for Simulation	-	05/01/65	Seepage inflows from WCA-1 based on mean stage of 15.75 ft. NGVD
Ending Date for Simulation	-	04/30/00	Cell-to-cell seepage not considered in analysis
Starting Date for Output	-	05/01/65	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	
Output Averaging Interval	days	7	
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)	30.0	37.3	24.2
GM Outflow C (ppb)	21.8	29.1	16.0
Load Reduction %	83%	79%	86%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	-0.2%	0.4%
Iterations & Convergence	3	0.1%
Warning/Error Messages	9	

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	6.94	7.31	7.69	8.06	8.40	8.77	9.14	9.60					9.60
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05					08/03/05
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	129.8	129.8	128.4					128.8
Cell Inflow Volume	hm3/yr	117.3	145.7	147.9	52.5	51.4	50.4	138.9	126.7					308.6
Cell Inflow Load	kg/yr	20442	17281	9555	9145	6435	2596	24208	17589					53796
Cell Inflow Conc	ppb	174.3	118.6	64.6	174.3	125.2	51.6	174.3	138.8					174.3
Treated Outflow Volume	hm3/yr	145.7	147.9	149.4	51.4	50.4	49.3	126.7	111.0					309.6
Treated Outflow Load	kg/yr	17281	9555	4553	6435	2596	1406	17589	3337					9296
Treated FWM Outflow Conc	ppb	118.6	64.6	30.5	125.2	51.6	28.5	138.8	30.1					30.0
Upper Confidence Limit	ppb	124.1	74.4	38.4	134.5	62.3	35.8	144.3	36.4					37.3
Lower Confidence Limit	ppb	111.9	54.7	23.9	114.4	42.0	23.0	132.4	25.0					24.2
Total Outflow Volume + Bypass	hm3/yr	145.7	147.9	149.4	51.4	50.4	49.3	126.7	111.0					309.6
Total Outflow Load + Bypass	kg/yr	17281	9555	4553	6435	2596	1406	17589	3337					9296.3
Total FWM Outflow Conc	ppb	118.6	64.6	30.5	125.2	51.6	28.5	138.8	30.1					30.0
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	3.51	3.62	3.78	1.57	1.56	1.63	4.15	4.02					9.23
Maximum Outflow	hm3/d	3.62	3.78	3.96	1.56	1.63	1.68	4.02	4.33					9.97
Surface Load Reduction	kg/yr	3161	7726	5002	2710	3839	1189	6619	14252					44500
Load Trapped in Sediments	kg/yr	3810	7865	5137	2630	3843	1212	2881	13377					40754
Overall Load Reduction	%	15%	45%	52%	30%	60%	46%	27%	81%					83%
Lower Confidence Limit	%	12%	39%	48%	24%	55%	44%	24%	78%					79%
Upper Confidence Limit	%	20%	50%	56%	36%	64%	46%	31%	83%					86%
Daily Geometric Mean	ppb	103.2	52.8	22.4	109.2	35.3	15.8	151.0	19.3					#N/A
Outflow Geo Mean - Composites	ppb	105.1	53.7	22.8	116.3	42.1	20.4	128.1	21.8					21.8
Upper Confidence Limit	ppb	110.3	63.43	30.4	126.3	52.6	27.4	134.3	27.8					29.1
Lower Confidence Limit	ppb	98.6	44.03	16.6	105.1	32.9	15.2	121.3	17.0					16.0
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%	100%	97%	100%	99%					100%
Frequency Outflow Conc > 20 ppb	%	100%	100%	66%	100%	100%	51%	100%	58%					89%
Frequency Outflow Conc > 50 ppb	%	100%	64%	1%	100%	26%	1%	100%	2%					60%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	100%	99%	100%	100%					100%
95th Percentile Outflow Conc	ppb	131	78	39	138	65	36	165	38					36
Mean Biomass P Storage	mg/m2	3970	2615	1240	4332	2020	837	3978	1444					2251
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	11.1	34.9					23.5
Unit Area P Removal	g/m2-yr	1264	2609	1237	1380	2016	836	1267	1442					1510
Mean Water Load	cm/d	10.6	13.2	9.8	7.5	7.4	9.5	16.7	3.7					3.1
Max Water Load	cm/d	116.3	120.1	91.0	82.3	81.9	112.2	182.6	49.3					34.2
Mean Depth	cm	70	71	70	58	57	57	52	53					60
Minimum Depth	cm	55	54	43	13	13	7	1	1					21
Maximum Depth	cm	132	134	136	88	93	105	120	115					119
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	9.5%	4.1%					2.2%
Flow/Width	m2/day	292	363	368	60	70	106	214	148					213.6
HRT Days	days	6.6	5.3	7.1	7.6	7.7	6.0	3.1	14.2					19.2
Mean Velocity	cm/sec	0.48	0.59	0.61	0.12	0.14	0.21	0.47	0.32					0.40
Seepage Outflow / Total Outflow	%	0%	0%	2%	2%	2%	2%	1%	3%					3%
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	1.44	1.44	1.40	0.60	0.60	0.60	1.55	1.41					3.4
95th Percentile Outflow Load	kg/d	185.17	104.94	49.49	77.79	34.04	19.13	217.49	46.30					116.0
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	-	-	-	-	-	0.92	0.92	-	0.85					3
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	1.06	-					1
Range Check - Flow/Width	-	1.39	-	-	-	0.43	0.66	1.02	0.92					5
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%	0.01%	0.01%	0.03%	0.03%	0.05%	-0.45%	-0.03%					-0.18%
Warning or Error Messages		Cell# 1 1A Flow/Width out of calib. range for EMG_3: 292 vs. 26 - 210 m2/day Cell# 5 2B Depth out of calib. range for SAV_3: 57 vs. 62 - 87 cm Cell# 5 2B Flow/Width out of calib. range for SAV_3: 70 vs. 162 - 374 m2/day Cell# 6 4 Depth out of calib. range for SAV_3: 57 vs. 62 - 87 cm Cell# 6 4 Flow/Width out of calib. range for SAV_3: 106 vs. 162 - 374 m2/day Cell# 7 5A Freq Z < 10 cm out of calib. range for EMG_3: 10 vs. 0 - 9 % Cell# 7 5A Flow/Width out of calib. range for EMG_3: 214 vs. 26 - 210 m2/day Cell# 8 5B Depth out of calib. range for SAV_3: 53 vs. 62 - 87 cm Cell# 8 5B Flow/Width out of calib. range for SAV_3: 148 vs. 162 - 374 m2/day													9

Table A.2 STA-1W: Case "2006 Base"

DMSTA2- Inputs & Outputs **Project: PROJECT_STA1W** Model Release: 7/1/2005
Current Date: 08/03/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2006_Base	STA-1W with Long Term Plan Enhancements
Input Series Name		TS_2006Base	Potential inflows include all basin runoff from S-5A Basin and EBWCD to STA-1 Inflow & Distribution Works
Starting Date for Simulation	-	05/01/65	Delivery to STA-1W at G-301 based on analysis of historic distribution
Ending Date for Simulation	-	04/30/00	All STA-1 I&D inflows up to 2000 cfs/day delivered to STA-1W; above 2000 cfs/day, G-302 Inflow to STA-1W computed as 2000+(Q-2000)**0.89
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
Output Averaging Interval	days	7	FWM Outflow C (ppb) 27.5 34.5 21.8
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 20.9 27.9 15.2
Rainfall P Conc	ppb	10	Load Reduction % 84% 80% 87%
Atmospheric P Load (Dry)	mg/m2-yr	20	Bypass Load (%) 0.0%

Diagnostics

H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	-0.2%	0.5%
Iterations & Convergence	3	0.1%
Warning/Error Messages	8	

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	7.57	7.97	8.37	8.77	9.17	9.57	9.97	10.49					10.49
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05					08/03/05
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	129.8	129.7	128.4					128.8
Cell Inflow Volume	hm3/yr	112.9	141.3	143.5	50.5	49.4	48.4	133.7	121.5					297.0
Cell Inflow Load	kg/yr	19656	16502	8891	8793	6092	2345	23276	16673					51725
Cell Inflow Conc	ppb	174.2	116.8	62.0	174.2	123.2	48.5	174.2	137.2					174.2
Treated Outflow Volume	hm3/yr	141.3	143.5	144.9	49.4	48.4	47.3	121.5	105.8					298.0
Treated Outflow Load	kg/yr	16502	8891	4095	6092	2345	1225	16673	2864					8185
Treated FWM Outflow Conc	ppb	116.8	62.0	28.3	123.2	48.5	25.9	137.2	27.1					27.5
Upper Confidence Limit	ppb	122.4	71.9	36.0	132.9	59.2	32.9	143.0	33.1					34.5
Lower Confidence Limit	ppb	110.0	52.1	21.9	112.2	39.1	20.6	130.6	22.3					21.8
Total Outflow Volume + Bypass	hm3/yr	141.3	143.5	144.9	49.4	48.4	47.3	121.5	105.8					298.0
Total Outflow Load + Bypass	kg/yr	16502	8891	4095	6092	2345	1225	16673	2864					8184.7
Total FWM Outflow Conc	ppb	116.8	62.0	28.3	123.2	48.5	25.9	137.2	27.1					27.5
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	2.55	2.67	2.75	1.14	1.15	1.18	3.02	2.94					6.70
Maximum Outflow	hm3/d	2.67	2.75	2.83	1.15	1.18	1.20	2.94	3.05					7.08
Surface Load Reduction	kg/yr	3153	7612	4796	2701	3747	1120	6604	13809					43541
Load Trapped in Sediments	kg/yr	3800	7751	4935	2622	3753	1144	2877	12990					39871
Overall Load Reduction	%	16%	46%	54%	31%	62%	48%	28%	83%					84%
Lower Confidence Limit	%	12%	40%	49%	25%	56%	46%	25%	80%					80%
Upper Confidence Limit	%	21%	52%	58%	37%	66%	48%	32%	85%					87%
Daily Geometric Mean	ppb	102.8	51.7	21.4	108.6	34.1	14.9	150.6	18.3					#N/A
Outflow Geo Mean - Composites	ppb	104.5	52.5	21.8	115.6	40.8	19.5	127.8	20.8					20.9
Upper Confidence Limit	ppb	109.9	62.28	29.3	125.7	51.3	26.2	134.0	26.6					27.9
Lower Confidence Limit	ppb	97.9	42.87	15.8	104.2	31.8	14.5	120.8	16.3					15.2
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%	100%	97%	100%	99%					100%
Frequency Outflow Conc > 20 ppb	%	100%	100%	61%	100%	99%	48%	100%	54%					87%
Frequency Outflow Conc > 50 ppb	%	100%	61%	0%	100%	23%	0%	100%	0%					55%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	100%	99%	100%	100%					100%
95th Percentile Outflow Conc	ppb	130	75	36	137	61	33	163	35					34
Mean Biomass P Storage	mg/m2	3959	2577	1191	4319	1972	791	3973	1402					2216
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	11.1	34.9					23.3
Unit Area P Removal	g/m2-yr	1260	2571	1188	1376	1969	789	1265	1400					1477
Mean Water Load	cm/d	10.2	12.8	9.5	7.3	7.1	9.1	16.1	3.6					3.0
Max Water Load	cm/d	84.5	88.4	66.3	59.8	60.5	81.7	132.6	31.7					24.8
Mean Depth	cm	70	71	70	57	57	57	52	53					60
Minimum Depth	cm	55	54	43	13	13	7	1	1					21
Maximum Depth	cm	124	125	126	83	87	98	113	106					111
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	9.5%	4.1%					2.2%
Flow/Width	m2/day	281	352	357	58	68	102	206	142					206.1
HRT Days	days	6.8	5.5	7.3	7.9	8.0	6.3	3.2	14.7					19.9
Mean Velocity	cm/sec	0.47	0.58	0.59	0.12	0.14	0.21	0.46	0.31					0.38
Seepage Outflow / Total Outflow	%	0%	0%	2%	2%	2%	2%	1%	3%					3%
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	1.41	1.37	1.34	0.59	0.59	0.58	1.51	1.34					3.2
95th Percentile Outflow Load	kg/d	176.18	94.47	43.57	75.12	31.16	16.70	208.36	39.31					99.7
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	-	-	-	-	-	0.92	0.92	-	0.85					3
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	1.06	-					1
Range Check - Flow/Width	-	1.34	-	-	-	0.42	0.63	-	0.88					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%
Mass Balance Error	%	0.01%	0.01%	0.01%	0.02%	0.03%	0.03%	-0.47%	-0.03%					-0.20%
Warning or Error Messages		Cell# 1 1A Flow/Width out of calib. range for EMG_3: 281 vs. 26 - 210 m2/day												8
		Cell# 5 2B Depth out of calib. range for SAV_3: 57 vs. 62 - 87 cm												
		Cell# 5 2B Flow/Width out of calib. range for SAV_3: 68 vs. 162 - 374 m2/day												
		Cell# 6 4 Depth out of calib. range for SAV_3: 57 vs. 62 - 87 cm												
		Cell# 6 4 Flow/Width out of calib. range for SAV_3: 102 vs. 162 - 374 m2/day												
		Cell# 7 5A Freq 2 < 10 cm out of calib. range for EMG_3: 10 vs. 0 - 9 %												
		Cell# 8 5B Depth out of calib. range for SAV_3: 53 vs. 62 - 87 cm												
		Cell# 8 5B Flow/Width out of calib. range for SAV_3: 142 vs. 162 - 374 m2/day												

Table A.3 STA-1W: Case "2006 Mod"

DMSTA2- Inputs & Outputs **Project: PROJECT_STA1W** Model Release: 7/1/2005 Current Date: 08/06/05

Case Description:
STA-1W with Long Term Plan Enhancements
Potential Include all S-5A Basin and EBWCD Runoff from ECP 2006 Simulation to STA-1 I&D Works
Distribution of outflows from STA-1 I&D assigned 70% to STA-1W, 30% to westerly flow path of STA-1E

Input Variable	Units	Value
Design Case Name	-	2006_Mod
Input Series Name	-	TS_2006All
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	7
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	20.3	25.2	16.7
GM Outflow C (ppb)	13.5	18.5	9.8
Load Reduction %	88%	85%	90%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	-0.2%	0.5%
Iterations & Convergence	3	0.2%
Warning/Error Messages	7	

Cell Number -->	Units	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	-	0.263			0.121			0.316					
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	7.31	7.69	8.06	8.43	8.80	9.14	9.51	9.97					9.97
Run Date	-	08/06/05	08/06/05	08/06/05	08/06/05	08/06/05	08/06/05	08/06/05	08/06/05					08/06/05
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	129.3	133.1	129.6					128.1
Cell Inflow Volume	hm3/yr	81.2	108.6	110.8	37.3	36.3	35.3	97.5	85.8					216.0
Cell Inflow Load	kg/yr	14148	11256	5216	6509	4011	1307	17000	10864					37657
Cell Inflow Conc	ppb	174.3	103.7	47.1	174.3	110.5	37.1	174.3	126.5					174.3
Treated Outflow Volume	hm3/yr	108.6	110.8	112.5	36.3	35.3	34.2	85.8	71.2					217.9
Treated Outflow Load	kg/yr	11256	5216	2204	4011	1307	692	10864	1537					4433
Treated FWM Outflow Conc	ppb	103.7	47.1	19.6	110.5	37.1	20.2	126.5	21.6					20.3
Upper Confidence Limit	ppb	110.2	56.2	25.1	121.7	45.7	24.8	133.5	25.5					25.2
Lower Confidence Limit	ppb	96.0	38.5	15.4	98.1	30.0	16.9	118.8	18.6					16.7
Total Outflow Volume + Bypass	hm3/yr	108.6	110.8	112.5	36.3	35.3	34.2	85.8	71.2					217.9
Total Outflow Load + Bypass	kg/yr	11256	5216	2204	4011	1307	692	10864	1537					4433.3
Total FWM Outflow Conc	ppb	103.7	47.1	19.6	110.5	37.1	20.2	126.5	21.6					20.3
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	2.43	2.57	2.71	1.12	1.12	1.18	2.92	2.83					6.46
Maximum Outflow	hm3/d	2.57	2.71	2.83	1.12	1.18	1.23	2.83	3.07					7.13
Surface Load Reduction	kg/yr	2893	6040	3012	2498	2704	615	6136	9327					33224
Load Trapped in Sediments	kg/yr	3493	6181	3181	2434	2726	647	2664	8830					30157
Overall Load Reduction	%	20%	54%	58%	38%	67%	47%	36%	86%					88%
Lower Confidence Limit	%	15%	48%	55%	32%	64%	47%	33%	84%					85%
Upper Confidence Limit	%	26%	59%	59%	45%	70%	45%	40%	87%					90%
Daily Geometric Mean	ppb	90.4	38.1	13.7	94.9	22.3	9.2	137.0	11.6					#N/A
Outflow Geo Mean - Composites	ppb	91.9	38.7	14.0	101.8	28.7	13.1	115.8	14.5					13.5
Upper Confidence Limit	ppb	98.1	47.62	19.3	113.5	37.1	17.4	123.2	18.2					18.5
Lower Confidence Limit	ppb	84.5	30.38	10.1	89.1	22.0	10.2	107.7	11.7					9.8
Frequency Outflow Conc > 10 ppb	%	100%	100%	84%	100%	100%	72%	100%	84%					82%
Frequency Outflow Conc > 20 ppb	%	100%	100%	14%	100%	89%	15%	100%	18%					35%
Frequency Outflow Conc > 50 ppb	%	100%	15%	0%	100%	3%	0%	100%	0%					11%
Freq Outflow Volume > 10 ppb	%	100%	100%	95%	100%	100%	90%	100%	95%					95%
95th Percentile Outflow Conc	ppb	116	58	25	123	46	27	155	29					24
Mean Biomass P Storage	mg/m2	3638	2054	768	4009	1433	447	3678	953					1799
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	11.1	34.9					21.7
Unit Area P Removal	g/m2-yr	1159	2050	766	1277	1430	446	1171	952					1117
Mean Water Load	cm/d	7.4	9.9	7.3	5.4	5.2	6.7	11.7	2.5					2.2
Max Water Load	cm/d	80.5	85.2	65.2	58.6	58.9	81.6	128.2	30.5					23.9
Mean Depth	cm	67	68	66	56	55	54	49	48					57
Minimum Depth	cm	54	50	39	13	11	1	1	1					20
Maximum Depth	cm	122	124	126	81	86	97	110	106					109
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	10.6%	7.1%					3.4%
Flow/Width	m2/day	202	270	276	43	50	74	150	100					152.8
HRT Days	days	9.1	6.9	9.1	10.5	10.6	8.1	4.2	19.0					25.9
Mean Velocity	cm/sec	0.35	0.46	0.48	0.09	0.10	0.16	0.35	0.24					0.30
Seepage Outflow / Total Outflow	%	0%	0%	2%	3%	3%	3%	1%	4%					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
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	1.03	1.01	1.00	0.44	0.44	0.43	1.08	0.95					2.3
95th Percentile Outflow Load	kg/d	117.66	54.33	23.62	48.57	17.46	9.47	137.70	21.62					54.8
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	-	-	-	-	-	0.89	0.87	-	0.78					3
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	1.18	-					1
Range Check - Flow/Width	-	-	-	-	-	0.31	0.46	-	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%	0.00%					0.00%
Mass Balance Error	%	0.01%	0.01%	0.01%	0.03%	0.03%	0.05%	-0.51%	-0.01%					-0.21%
Warning or Error Messages														7

Cell# 5 2B Depth out of calib. range for SAV_3: 55 vs. 62 - 87 cm
Cell# 5 2B Flow/Width out of calib. range for SAV_3: 50 vs. 162 - 374 m2/day
Cell# 6 4 Depth out of calib. range for SAV_3: 54 vs. 62 - 87 cm
Cell# 6 4 Flow/Width out of calib. range for SAV_3: 74 vs. 162 - 374 m2/day
Cell# 7 5A Freq 2 < 10 cm out of calib. range for EMG_3: 11 vs. 0 - 9 %
Cell# 8 5B Depth out of calib. range for SAV_3: 48 vs. 62 - 87 cm
Cell# 8 5B Flow/Width out of calib. range for SAV_3: 100 vs. 162 - 374 m2/day

Table A.4 STA-1E: Case "2006 All"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1E Model Release: 7/1/2005 Current Date: 08/03/05

Input Variable	Units	Value
Design Case Name	-	2006 All
Input Series Name		TS_2006All
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	7
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)	22.1	27.9	17.3
GM Outflow C (ppb)	14.5	19.8	10.5
Load Reduction %	81%	76%	85%
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	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	11.63	12.11	12.63	12.94	13.43	13.94	14.49	14.80	15.31	15.63	16.11	16.63	16.63
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05
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	57.5	69.6	63.4	112.0	112.2	112.5	112.8	46.0	41.3	71.8	66.1	108.5	287.3
Cell Inflow Load	kg/yr	6694	5690	3633	13054	11513	9159	4567	5356	3751	8368	6474	6995	33472
Cell Inflow Conc	ppb	116.5	81.7	57.3	116.5	102.6	81.4	40.5	116.5	90.9	116.5	97.9	64.4	116.5
Treated Outflow Volume	hm3/yr	69.6	63.4	58.1	112.2	112.5	112.8	113.2	41.3	42.1	66.1	66.4	111.5	282.9
Treated Outflow Load	kg/yr	5690	3633	1284	11513	9159	4567	2301	3751	2491	6474	4504	2655	6240
Treated FWM Outflow Conc	ppb	81.7	57.3	22.1	102.6	81.4	40.5	20.3	90.9	59.2	97.9	67.8	23.8	22.1
Upper Confidence Limit	ppb	84.2	64.0	27.6	104.6	87.4	48.2	25.8	95.8	68.1	101.5	76.1	30.1	27.9
Lower Confidence Limit	ppb	78.7	50.1	17.4	100.2	74.5	33.1	15.9	85.3	49.9	93.7	58.8	18.6	17.3
Total Outflow Volume + Bypass	hm3/yr	69.6	63.4	58.1	112.2	112.5	112.8	113.2	41.3	42.1	66.1	66.4	111.5	282.9
Total Outflow Load + Bypass	kg/yr	5690	3633	1284	11513	9159	4567	2301	3751	2491	6474	4504	2655	6239.9
Total FWM Outflow Conc	ppb	81.7	57.3	22.1	102.6	81.4	40.5	20.3	90.9	59.2	97.9	67.8	23.8	22.1
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	1.30	1.34	1.33	2.53	2.53	2.54	2.54	1.04	1.03	1.62	1.61	2.66	6.48
Maximum Outflow	hm3/d	1.34	1.33	1.30	2.53	2.54	2.54	2.50	1.03	1.05	1.61	1.61	2.63	6.44
Surface Load Reduction	kg/yr	1005	2057	2349	1541	2354	4592	2266	1604	1260	1894	1970	4340	27233
Load Trapped in Sediments	kg/yr	895	1742	2287	1110	2435	4681	2346	1229	1330	1321	2049	4534	25960
Overall Load Reduction	%	15%	36%	65%	12%	20%	50%	50%	30%	34%	23%	30%	62%	81%
Lower Confidence Limit	%	12%	31%	60%	10%	16%	45%	46%	26%	27%	20%	25%	58%	76%
Upper Confidence Limit	%	18%	42%	68%	14%	25%	55%	52%	34%	40%	26%	37%	65%	85%
Daily Geometric Mean	ppb	73.3	51.0	15.1	96.7	74.1	30.3	12.9	84.9	50.7	96.3	60.7	15.3	#N/A
Outflow Geo Mean - Composites	ppb	73.5	51.0	15.4	96.9	74.3	30.7	13.2	86.0	50.8	93.1	59.6	15.8	14.5
Upper Confidence Limit	ppb	75.9	58.00	20.6	99.3	81.0	38.5	18.2	91.6	60.3	97.5	68.7	21.5	19.8
Lower Confidence Limit	ppb	70.4	43.45	11.3	93.8	66.5	23.5	9.5	79.6	41.2	88.0	50.0	11.4	10.5
Frequency Outflow Conc > 10 ppb	%	100%	100%	81%	100%	100%	100%	68%	100%	100%	100%	100%	79%	75%
Frequency Outflow Conc > 20 ppb	%	100%	100%	30%	100%	100%	85%	23%	100%	100%	100%	100%	35%	52%
Frequency Outflow Conc > 50 ppb	%	100%	55%	0%	100%	100%	9%	0%	100%	56%	100%	82%	0%	28%
Freq Outflow Volume > 10 ppb	%	100%	100%	94%	100%	100%	100%	87%	100%	100%	100%	100%	94%	92%
95th Percentile Outflow Conc	ppb	96	66	30	120	90	53	28	101	69	110	77	33	30
Mean Biomass P Storage	mg/m2	2958	2431	1027	3702	3213	1797	773	3330	2472	3549	2785	1069	2079
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	11.0	11.1	34.9	34.9	11.0	11.1	11.1	11.1	34.9	17.5
Unit Area P Removal	g/m2-yr	941	774	1025	1167	1023	1793	772	1051	787	1129	887	1067	1038
Mean Water Load	cm/d	16.5	8.5	7.8	32.3	12.9	11.8	10.2	10.8	6.7	16.8	7.8	7.0	3.1
Max Water Load	cm/d	136.2	59.7	59.6	265.7	106.4	97.5	83.4	88.6	61.2	138.4	69.5	62.7	25.9
Mean Depth	cm	68	54	62	95	60	67	67	99	51	61	52	67	65
Minimum Depth	cm	41	39	13	90	35	42	36	42	26	1	12	50	35
Maximum Depth	cm	119	96	96	140	113	113	113	108	97	121	100	113	109
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%
Flow/Width	m2/day	238	123	112	465	198	199	199	168	96	262	112	185	180.0
HRT Days	days	4.1	6.3	8.0	2.9	4.7	5.7	6.6	9.2	7.7	3.6	6.7	9.5	20.5
Mean Velocity	cm/sec	0.40	0.27	0.21	0.57	0.38	0.34	0.35	0.20	0.22	0.50	0.25	0.32	0.32
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	0%	0%	0%	11%	0%	8%	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	0.59	0.57	0.55	1.07	1.07	1.07	1.06	0.42	0.43	0.66	0.66	1.08	2.7
95th Percentile Outflow Load	kg/d	51.81	35.25	14.87	110.31	92.72	51.78	27.21	39.80	27.87	65.91	48.27	31.91	74.4
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	-	-	-	-	1.24	-	-	-	1.30	-	-	-	-	2
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Flow/Width	-	1.14	-	0.69	2.21	-	-	-	-	-	1.25	-	-	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%	0.01%
Mass Balance Error	%	0.00%	0.00%	0.01%	0.00%	0.01%	0.01%	0.01%	0.00%	0.01%	0.00%	0.01%	0.01%	0.02%
Warning or Error Messages														6

Cell# 1 EDCE Flow/Width out of calib. range for EMG_3: 238 vs. 26 - 210 m2/day
Cell# 3 2 Flow/Width out of calib. range for SAV_3: 112 vs. 162 - 374 m2/day
Cell# 4 EDCW Depth out of calib. range for EMG_3: 95 vs. 35 - 76 cm
Cell# 4 EDCW Flow/Width out of calib. range for EMG_3: 465 vs. 26 - 210 m2/day
Cell# 8 WDCW Depth out of calib. range for EMG_3: 99 vs. 35 - 76 cm
Cell# 10 WDCE Flow/Width out of calib. range for EMG_3: 262 vs. 26 - 210 m2/day

Table A.5 STA-1E: Cells 1-4: Case "1_4 2006Base"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1E Model Release: 7/1/2005
Current Date: 08/03/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	1_4 2006Base	Cells 1-4S of STA-1E with East Distribution Cell
Input Series Name		TS_1_42006A	Inflows from C-51 West adjusted for same-day bypass to S-155A of L-8 runoff through S-5AE,; 20% assigned to Cells 5-7
Starting Date for Simulation	-	05/01/65	Cell-to-cell seepage not considered in analysis; inflows increased by 5% (approx. 6,400 ac-ft/yr) for seepage recycle from west flow path
Ending Date for Simulation	-	04/30/00	East Distribution Cell modeled as two cells in parallel
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
Output Averaging Interval	days	7	FWM Outflow C (ppb) 18.3 24.1 13.8
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 14.9 20.5 10.6
Rainfall P Conc	ppb	10	Load Reduction % 85% 80% 88%
Atmospheric P Load (Dry)	mg/m2-yr	20	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	5	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	EDCE	1	2	EDCW	3	4N	4S					
Vegetation Type	-->	EMG_3	EMG_3	SAV_3	EMG_3	EMG_3	SAV_3	SAV_3					
Inflow Fraction	-	0.269			0.571								
Downstream Cell Number	-	2	3		5	6	7						
Surface Area	km2	0.95	2.25	2.23	0.95	2.38	2.61	3.04					
Mean Width of Flow Path	km	0.66	1.55	1.55	0.66	1.55	1.55	1.55					
Number of Tanks in Series	-	0.5	3.0	3.0	0.5	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	40	60	90	40	60	60					
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4					
Outflow Coefficient - Intercept	-	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	0.0095	0.0042	0.0042	0.0095			0.0054					
Outflow Seepage Control Elev	cm	-137	-137	-99	-87			-38					
Max Outflow Seepage Conc	ppb	20	20	20	20			20					
Seepage Recycle to Cell Number	-	1	1	1	4			7					
Seepage Recycle Fraction	-	1	1	1	1			1					
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30					
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500					
Initial Water Column Depth	cm	50	50	50	50	50	50	50					
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3					
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22					
C2 = Conc at Half-Max Uptake	ppb	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					
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40					
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100					
Z3 = Upper Penalty Depth	cm	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	7.37	7.86	8.37	8.69	9.20	9.69	10.20						10.20
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05						08/03/05
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
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
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
Output Duration	days	12784	12784	12784	12784	12784	12784	12784						12784
Cell Label		EDCE	1	2	EDCW	3	4N	4S						Total
Downstream Cell Label		1	2	Outflow	3	4N	4S	Outflow						-
Network Simulation Name	-	none	none	none	none	none	none	none						none
Simulation Type	-	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						14.41
Mean Rainfall	cm/yr	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
Cell Inflow Volume	hm3/yr	53.5	65.7	59.4	113.6	113.8	114.1	114.4						167.2
Cell Inflow Load	kg/yr	6472	5426	3316	13738	12138	9654	4573						20210
Cell Inflow Conc	ppb	120.9	82.6	55.8	120.9	106.7	84.6	40.0						120.9
Treated Outflow Volume	hm3/yr	65.7	59.4	54.2	113.8	114.1	114.4	114.8						169.0
Treated Outflow Load	kg/yr	5426	3316	1002	12138	9654	4573	2100						3102
Treated FWM Outflow Conc	ppb	82.6	55.8	18.5	106.7	84.6	40.0	18.3						18.3
Upper Confidence Limit	ppb	85.3	63.0	23.9	108.8	90.9	48.5	24.2						24.1
Lower Confidence Limit	ppb	79.2	47.9	14.1	104.2	77.2	31.8	13.7						13.8
Total Outflow Volume + Bypass	hm3/yr	65.7	59.4	54.2	113.8	114.1	114.4	114.8						169.0
Total Outflow Load + Bypass	kg/yr	5426	3316	1002	12138	9654	4573	2100						3102.0
Total FWM Outflow Conc	ppb	82.6	55.8	18.5	106.7	84.6	40.0	18.3						18.3
Bypass Load	kg/yr	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
Maximum Inflow	hm3/d	0.96	1.00	0.98	2.03	2.03	2.04	2.03						2.98
Maximum Outflow	hm3/d	1.00	0.98	0.95	2.03	2.04	2.03	1.99						2.95
Surface Load Reduction	kg/yr	1046	2110	2313	1600	2484	5082	2473						17108
Load Trapped in Sediments	kg/yr	922	1785	2255	1148	2565	5171	2556						16402
Overall Load Reduction	%	16%	39%	70%	12%	20%	53%	54%						85%
Lower Confidence Limit	%	13%	33%	65%	10%	16%	46%	50%						80%
Upper Confidence Limit	%	20%	45%	73%	14%	26%	59%	57%						88%
Daily Geometric Mean	ppb	75.8	52.4	14.9	100.3	79.9	34.9	14.6						#N/A
Outflow Geo Mean - Composites	ppb	76.1	52.5	15.3	100.4	80.0	35.3	14.8						14.9
Upper Confidence Limit	ppb	78.5	59.69	20.6	102.6	86.5	43.8	20.6						20.5
Lower Confidence Limit	ppb	72.9	44.56	11.0	97.7	72.4	27.3	10.4						10.6
Frequency Outflow Conc > 10 ppb	%	100%	100%	95%	100%	100%	100%	90%						92%
Frequency Outflow Conc > 20 ppb	%	100%	100%	14%	100%	100%	99%	15%						51%
Frequency Outflow Conc > 50 ppb	%	100%	67%	0%	100%	100%	5%	0%						15%
Freq Outflow Volume > 10 ppb	%	100%	100%	99%	100%	100%	100%	97%						98%
95th Percentile Outflow Conc	ppb	98	62	23	127	93	50	24						24
Mean Biomass P Storage	mg/m2	3044	2491	1013	3809	3383	1984	842						2094
Storage Increase / Net Removal	%	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						19.0
Unit Area P Removal	g/m2-yr	969	794	1011	1207	1078	1981	841						1138
Mean Water Load	cm/d	15.4	8.0	7.3	32.7	13.1	12.0	10.3						3.2
Max Water Load	cm/d	100.4	44.5	44.1	213.2	85.5	78.1	66.6						20.7
Mean Depth	cm	69	54	62	94	62	67	67						65
Minimum Depth	cm	45	40	26	90	37	49	36						42
Maximum Depth	cm	111	89	88	132	107	107	106						103
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%						0.0%
Flow/Width	m2/day	222	116	105	471	201	201	202						192.4
HRT Days	days	4.5	6.8	8.5	2.9	4.8	5.6	6.5						20.6
Mean Velocity	cm/sec	0.37	0.25	0.20	0.58	0.37	0.35	0.35						0.33
Seepage Outflow / Total Outflow	%	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
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0						0.0
95th Percentile Outflow Volume	hm3/d	0.43	0.43	0.43	0.83	0.85	0.86	0.89						1.3
95th Percentile Outflow Load	kg/d	39.33	25.72	9.35	94.35	76.11	39.66	19.93						28.9
Simulated / Specified Mean Depth	%	#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
Release 2 Demand Met	%	#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
Range Check - Mean Depth	-	-	-	0.99	1.23	-	-	-						2
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-						0
Range Check - Flow/Width	-	1.06	-	0.65	2.25	-	-	-						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%						0.01%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%						0.01%
Warning or Error Messages														5

Cell# 1 EDCE Flow/Width out of calib. range for EMG_3: 222 vs. 26 - 210 m2/day
Cell# 3 2 Depth out of calib. range for SAV_3: 62 vs. 62 - 87 cm
Cell# 3 2 Flow/Width out of calib. range for SAV_3: 105 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: 471 vs. 26 - 210 m2/day

Table A.6 STA-1E: Cells 5-7: Case "5_7 2006Base"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1E Model Release: 7/1/2005
Current Date: 08/03/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	5_7 2006Base	Cells 5-7 of STA-1E with West Distribution Cell
Input Series Name		TS_5_72006Bas	Inflows include base case diversion of S-5A through G-311 plus 20% of STA-1E Inflow at S-319
Starting Date for Simulation	-	05/01/65	Cell-to-cell seepage not considered in analysis
Ending Date for Simulation	-	04/30/00	West Distribution Cell modeled as two cells in parallel
Starting Date for Output	-	05/01/65	
Integration Steps Per Day	-	4	
Number of Iterations	-	0	
Output Averaging Interval	days	7	
Inflow Conc Scale Factor	-	1	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Simulation Type:	Uncertainty Analysis		
Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	19.5	21.7	18.0
GM Outflow C (ppb)	5.9	7.6	4.9
Load Reduction %	87%	85%	88%
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	3	0.0%
Warning/Error Messages	3	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	WDCW	7	WDCE	5	6							
Vegetation Type	-->	EMG_3	EMG_3	EMG_3	EMG_3	SAV_3							
Inflow Fraction	-	0.4		0.6									
Downstream Cell Number	-	2	5	4	5								
Surface Area	km2	1.17	1.69	1.17	2.31	4.25							
Mean Width of Flow Path	km	0.75	1.18	0.75	1.61	1.61							
Number of Tanks in Series	-	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	100	40	40	40	60							
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4							
Outflow Coefficient - Intercept	-	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	0.01		0.01									
Outflow Seepage Control Elev	cm	-15		-76									
Max Outflow Seepage Conc	ppb	20		20									
Seepage Recycle to Cell Number	-												
Seepage Recycle Fraction	-												
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30							
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500							
Initial Water Column Depth	cm	200	200	200	200	200							
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3							
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22							
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300							
K = Net Settling Rate at Steady State	m/yr	16.8	16.8	16.8	16.8	52.5							
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40							
Z2 = Lower Penalty Depth	cm	100	100	100	100	100							
Z3 = Upper Penalty Depth	cm	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	5.37	5.86	6.17	6.66	7.17								7.17
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05								08/03/05
Starting Date for Simulation	-	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
Ending Date	-	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
Cell Label		WDCW	7	WDCE	5	6								Total
Downstream Cell Label		7	6	5	6	Outflow								-
Network Simulation Name	-	none	none	none	none	none								none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta								Uncerta
Surface Area	km2	1.17	1.69	1.17	2.31	4.25								10.58
Mean Rainfall	cm/yr	142.9	142.9	142.9	142.9	142.9								142.9
Mean ET	cm/yr	129.7	129.7	129.2	129.4	129.7								129.5
Cell Inflow Volume	hm3/yr	20.6	16.1	30.8	25.8	43.3								51.4
Cell Inflow Load	kg/yr	2753	1437	4130	2486	2031								6883
Cell Inflow Conc	ppb	133.9	89.4	133.9	96.4	47.0								133.9
Treated Outflow Volume	hm3/yr	16.1	17.2	25.8	26.1	46.7								46.7
Treated Outflow Load	kg/yr	1437	739	2486	1292	913								913
Treated FWM Outflow Conc	ppb	89.4	43.1	96.4	49.5	19.5								19.5
Upper Confidence Limit	ppb	96.8	51.3	102.3	58.6	21.7								21.7
Lower Confidence Limit	ppb	81.8	36.3	90.0	41.5	18.0								18.0
Total Outflow Volume + Bypass	hm3/yr	16.1	17.2	25.8	26.1	46.7								46.7
Total Outflow Load + Bypass	kg/yr	1437	739	2486	1292	913								912.7
Total FWM Outflow Conc	ppb	89.4	43.1	96.4	49.5	19.5								19.5
Bypass Load	kg/yr	0	0	0	0	0								0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0								0.0
Maximum Inflow	hm3/d	1.16	1.14	1.74	1.75	3.17								2.90
Maximum Outflow	hm3/d	1.14	1.26	1.75	1.91	3.46								3.46
Surface Load Reduction	kg/yr	1316	697	1644	1194	1119								5970
Load Trapped in Sediments	kg/yr	1031	770	1083	1270	1319								5473
Overall Load Reduction	%	48%	49%	40%	48%	55%								87%
Lower Confidence Limit	%	44%	43%	36%	42%	58%								85%
Upper Confidence Limit	%	52%	53%	44%	53%	51%								88%
Daily Geometric Mean	ppb	69.0	23.4	82.0	32.3	5.2								#N/A
Outflow Geo Mean - Composites	ppb	71.5	24.6	76.3	31.1	5.9								5.9
Upper Confidence Limit	ppb	79.5	32.85	82.5	40.5	7.6								7.6
Lower Confidence Limit	ppb	63.2	17.86	69.6	23.0	4.9								4.9
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%	11%								11%
Frequency Outflow Conc > 20 ppb	%	100%	74%	100%	96%	4%								6%
Frequency Outflow Conc > 50 ppb	%	100%	3%	99%	4%	1%								4%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	42%								42%
95th Percentile Outflow Conc	ppb	91	41	102	48	17								17
Mean Biomass P Storage	mg/m2	2790	1429	2920	1725	311								1359
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%								0%
Net Storage Turnover Rate	1/yr	11.1	11.1	11.1	11.1	34.9								13.3
Unit Area P Removal	g/m2-yr	885	455	930	550	311								517
Mean Water Load	cm/d	4.8	2.6	7.2	3.1	2.8								1.3
Max Water Load	cm/d	99.5	67.4	149.3	75.6	74.7								27.4
Mean Depth	cm	95	43	47	42	61								56
Minimum Depth	cm	13	25	1	1	49								26
Maximum Depth	cm	115	96	115	100	117								110
Frequency Depth < 10 cm	%	0.0%	0.0%	2.7%	1.0%	0.0%								0.5%
Flow/Width	m2/day	75	37	113	44	74								65.7
HRT Days	days	19.6	16.7	6.6	13.9	21.9								42.4
Mean Velocity	cm/sec	0.09	0.10	0.27	0.12	0.14								0.14
Seepage Outflow / Total Outflow	%	22%	0%	17%	0%	0%								17%
Release 1 Outflow Volume	hm3/yr	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
95th Percentile Outflow Volume	hm3/d	0.15	0.16	0.23	0.24	0.44								0.4
95th Percentile Outflow Load	kg/d	12.95	5.91	20.98	10.48	6.00								6.0
Simulated / Specified Mean Depth	%	#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
Release 2 Demand Met	%	#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
Range Check - Mean Depth	-	1.24	-	-	-	0.99								2
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-								0
Range Check - Flow/Width	-	-	-	-	-	0.45								1
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%
Mass Balance Error	%	0.02%	0.17%	0.00%	0.11%	0.18%								0.14%
Warning or Error Messages		Cell# 1 WDCW Depth out of calib. range for EMG_3: 95 vs. 35 - 76 cm Cell# 5 6 Depth out of calib. range for SAV_3: 61 vs. 62 - 87 cm Cell# 5 6 Flow/Width out of calib. range for SAV_3: 74 vs. 162 - 374 m2/day												3

Table A.7 STA-1E: Cells 1-4: Case "1_4 2006Mod"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1E Model Release: 7/1/2005
Current Date: 08/03/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	1_4 2006Mod	Cells 1-4S of STA-1E with East Distribution Cell
Input Series Name		TS_1_42006A	Inflows from C-51 West adjusted for same-day bypass to S-155A of L-8 runoff through S-5AE,
Starting Date for Simulation	-	05/01/65	Cell-to-cell seepage not considered in analysis; inflows increased by 4% (approx. 6,400 ac-ft/yr) for seepage recycle from west flow path
Ending Date for Simulation	-	04/30/00	East Distribution Cell modeled as two cells in parallel
Starting Date for Output	-	05/01/65	
Integration Steps Per Day	-	4	
Number of Iterations	-	0	
Output Averaging Interval	days	7	
Inflow Conc Scale Factor	-	1	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	24.3	31.2	18.4
GM Outflow C (ppb)	20.5	27.3	14.8
Load Reduction %	80%	74%	85%
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	5	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	EDCE	1	2	EDCW	3	4N	4S					
Vegetation Type	-->	EMG_3	EMG_3	SAV_3	EMG_3	EMG_3	SAV_3	SAV_3					
Inflow Fraction	-	0.333			0.707								
Downstream Cell Number	-	2	3		5	6	7						
Surface Area	km2	0.95	2.25	2.23	0.95	2.38	2.61	3.04					
Mean Width of Flow Path	km	0.66	1.55	1.55	0.66	1.55	1.55	1.55					
Number of Tanks in Series	-	0.5	3.0	3.0	0.5	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	40	60	90	40	60	60					
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4					
Outflow Coefficient - Intercept	-	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	0.0095	0.0042	0.0042	0.0095			0.0054					
Outflow Seepage Control Elev	cm	-137	-137	-99	-87			-38					
Max Outflow Seepage Conc	ppb	20	20	20	20			20					
Seepage Recycle to Cell Number	-	1	1	1	4			7					
Seepage Recycle Fraction	-	1	1	1	1			1					
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30					
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500					
Initial Water Column Depth	cm	50	50	50	50	50	50	50					
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3					
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22					
C2 = Conc at Half-Max Uptake	ppb	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					
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40					
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100					
Z3 = Upper Penalty Depth	cm	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	6.54	7.00	7.46	7.74	8.20	8.66	9.14						9.14
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05						08/03/05
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
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
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
Output Duration	days	12784	12784	12784	12784	12784	12784	12784						12784
Cell Label		EDCE	1	2	EDCW	3	4N	4S						Total
Downstream Cell Label		1	2	Outflow	3	4N	4S	Outflow						-
Network Simulation Name	-	none	none	none	none	none	none	none						none
Simulation Type	-	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						14.41
Mean Rainfall	cm/yr	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
Cell Inflow Volume	hm3/yr	66.3	78.6	72.2	140.7	140.8	141.1	141.5						207.0
Cell Inflow Load	kg/yr	8012	6889	4565	17010	15377	12780	6897						25022
Cell Inflow Conc	ppb	120.9	87.7	63.2	120.9	109.2	90.6	48.8						120.9
Treated Outflow Volume	hm3/yr	78.6	72.2	67.0	140.8	141.1	141.5	141.9						208.9
Treated Outflow Load	kg/yr	6889	4565	1607	15377	12780	6897	3469						5076
Treated FWM Outflow Conc	ppb	87.7	63.2	24.0	109.2	90.6	48.8	24.5						24.3
Upper Confidence Limit	ppb	90.1	70.0	30.5	110.9	96.0	57.4	31.6						31.2
Lower Confidence Limit	ppb	84.6	55.5	18.4	107.1	84.0	40.1	18.5						18.4
Total Outflow Volume + Bypass	hm3/yr	78.6	72.2	67.0	140.8	141.1	141.5	141.9						208.9
Total Outflow Load + Bypass	kg/yr	6889	4565	1607	15377	12780	6897	3469						5076.5
Total FWM Outflow Conc	ppb	87.7	63.2	24.0	109.2	90.6	48.8	24.5						24.3
Bypass Load	kg/yr	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
Maximum Inflow	hm3/d	1.18	1.23	1.21	2.51	2.52	2.52	2.51						3.69
Maximum Outflow	hm3/d	1.23	1.21	1.18	2.52	2.52	2.51	2.48						3.66
Surface Load Reduction	kg/yr	1122	2324	2958	1633	2597	5882	3428						19945
Load Trapped in Sediments	kg/yr	969	1951	2864	1162	2678	5971	3478						19073
Overall Load Reduction	%	14%	34%	65%	10%	17%	46%	50%						80%
Lower Confidence Limit	%	12%	29%	60%	8%	13%	40%	45%						74%
Upper Confidence Limit	%	17%	40%	69%	11%	21%	52%	54%						85%
Daily Geometric Mean	ppb	80.6	59.5	20.1	102.6	85.6	43.2	20.3						#N/A
Outflow Geo Mean - Composites	ppb	80.8	59.6	20.4	102.8	85.7	43.5	20.6						20.5
Upper Confidence Limit	ppb	83.0	66.40	26.8	104.7	91.4	52.2	27.6						27.3
Lower Confidence Limit	ppb	78.0	51.87	15.0	100.5	79.0	34.9	14.8						14.8
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%	100%	100%	99%						99%
Frequency Outflow Conc > 20 ppb	%	100%	100%	55%	100%	100%	100%	56%						88%
Frequency Outflow Conc > 50 ppb	%	100%	97%	0%	100%	100%	26%	0%						56%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	100%	100%	100%						100%
95th Percentile Outflow Conc	ppb	104	70	30	131	99	60	32						31
Mean Biomass P Storage	mg/m2	3200	2723	1287	3880	3532	2292	1146						2332
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%						0%
Net Storage Turnover Rate	1/yr	11.1	11.1	34.9	11.0	11.1	34.9	34.9						19.9
Unit Area P Removal	g/m2-yr	1019	867	1284	1222	1125	2288	1144						1323
Mean Water Load	cm/d	19.1	9.6	8.9	40.5	16.2	14.8	12.7						3.9
Max Water Load	cm/d	124.3	54.6	54.3	264.0	105.7	96.7	82.6						25.6
Mean Depth	cm	72	56	63	95	66	70	70						68
Minimum Depth	cm	47	40	35	90	38	53	43						46
Maximum Depth	cm	117	94	93	139	113	113	112						109
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%						0.0%
Flow/Width	m2/day	275	139	128	584	249	249	250						237.0
HRT Days	days	3.8	5.9	7.1	2.4	4.0	4.7	5.5						17.2
Mean Velocity	cm/sec	0.44	0.28	0.23	0.71	0.44	0.41	0.42						0.39
Seepage Outflow / Total Outflow	%	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
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0						0.0
95th Percentile Outflow Volume	hm3/d	0.52	0.52	0.52	1.03	1.05	1.06	1.09						1.6
95th Percentile Outflow Load	kg/d	50.95	35.08	14.58	118.99	99.99	59.33	31.83						46.5
Simulated / Specified Mean Depth	%	#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
Release 2 Demand Met	%	#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
Range Check - Mean Depth	-	-	-	-	1.25	-	-	-						1
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-						0
Range Check - Flow/Width	-	1.31	-	0.79	2.78	1.18	-	-						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%						0.01%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%						0.01%
Warning or Error Messages														5

Cell# 1 EDCE Flow/Width out of calib. range for EMG_3: 275 vs. 26 - 210 m2/day
Cell# 3 2 Flow/Width out of calib. range for SAV_3: 128 vs. 162 - 374 m2/day
Cell# 4 EDCW Depth out of calib. range for EMG_3: 95 vs. 35 - 76 cm
Cell# 4 EDCW Flow/Width out of calib. range for EMG_3: 584 vs. 26 - 210 m2/day
Cell# 5 3 Flow/Width out of calib. range for EMG_3: 249 vs. 26 - 210 m2/day

Table A.8 STA-1E: Cells 5-7: Case "5_7 2006Mod"

DMSTA2- Inputs & Outputs — **Project: PROJECT_STA1E** — Model Release: 7/1/2005 — Current Date: 08/07/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	5_7 2006Mod	Cells 5-7 of STA-1E with West Distribution Cell
Input Series Name		TS_ST1IDAll	Inflows limited to discharges from G-311, set at 30% of total inflows to STA-1 I&D Works (S-5A Basin and EBWCD Runoff)
Starting Date for Simulation	-	05/01/65	Cell-to-cell seepage not considered in analysis
Ending Date for Simulation	-	04/30/00	West Distribution Cell modeled as two cells in parallel
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
Output Averaging Interval	days	7	FWM Outflow C (ppb) 27.2 34.9 21.5
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 17.5 24.5 12.3
Rainfall P Conc	ppb	10	Load Reduction % 85% 81% 88%
Atmospheric P Load (Dry)	mg/m2-yr	20	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	-	WDCW	7	WDCE	5	6							
Vegetation Type	-->	EMG_3	EMG_3	EMG_3	EMG_3	SAV_3							
Inflow Fraction	-	0.12		0.18									
Downstream Cell Number	-	2	5	4	5								
Surface Area	km2	1.17	1.69	1.17	2.31	4.25							
Mean Width of Flow Path	km	0.75	1.18	0.75	1.61	1.61							
Number of Tanks in Series	-	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	100	40	40	40	60							
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4							
Outflow Coefficient - Intercept	-	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	0.01		0.01									
Outflow Seepage Control Elev	cm	-15		-76									
Max Outflow Seepage Conc	ppb	20		20									
Seepage Recycle to Cell Number	-												
Seepage Recycle Fraction	-												
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30							
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500							
Initial Water Column Depth	cm	200	200	200	200	200							
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3							
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22							
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300							
K = Net Settling Rate at Steady State	m/yr	16.8	16.8	16.8	16.8	52.5							
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40							
Z2 = Lower Penalty Depth	cm	100	100	100	100	100							
Z3 = Upper Penalty Depth	cm	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	4.57	5.03	5.31	5.83	6.37								6.37
Run Date	-	08/07/05	08/07/05	08/07/05	08/07/05	08/07/05								08/07/05
Starting Date for Simulation	-	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
Ending Date	-	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
Cell Label		WDCW	7	WDCE	5	6								Total
Downstream Cell Label		7	6	5	6	Outflow								-
Network Simulation Name	-	none	none	none	none	none								none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta								Uncerta
Surface Area	km2	1.17	1.69	1.17	2.31	4.25								10.58
Mean Rainfall	cm/yr	142.9	142.9	142.9	142.9	142.9								142.9
Mean ET	cm/yr	129.7	129.7	120.9	129.7	129.7								128.7
Cell Inflow Volume	hm3/yr	37.0	32.9	55.6	50.9	85.1								92.6
Cell Inflow Load	kg/yr	6456	4392	9683	6623	7105								16139
Cell Inflow Conc	ppb	174.3	133.5	174.3	130.1	83.5								174.3
Treated Outflow Volume	hm3/yr	32.9	33.9	50.9	51.2	88.3								88.3
Treated Outflow Load	kg/yr	4392	2769	6623	4336	2405								2405
Treated FWM Outflow Conc	ppb	133.5	81.7	130.1	84.6	27.2								27.2
Upper Confidence Limit	ppb	141.1	95.6	136.1	97.3	34.9								34.9
Lower Confidence Limit	ppb	124.7	67.6	123.4	71.6	21.5								21.5
Total Outflow Volume + Bypass	hm3/yr	32.9	33.9	50.9	51.2	88.3								88.3
Total Outflow Load + Bypass	kg/yr	4392	2769	6623	4336	2405								2404.9
Total FWM Outflow Conc	ppb	133.5	81.7	130.1	84.6	27.2								27.2
Bypass Load	kg/yr	0	0	0	0	0								0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0								0.0
Maximum Inflow	hm3/d	1.11	1.10	1.66	1.62	2.85								2.77
Maximum Outflow	hm3/d	1.10	1.14	1.62	1.71	3.02								3.02
Surface Load Reduction	kg/yr	2064	1623	3060	2287	4700								13734
Load Trapped in Sediments	kg/yr	1581	1694	1288	2365	4894								11823
Overall Load Reduction	%	32%	37%	32%	35%	66%								85%
Lower Confidence Limit	%	28%	30%	28%	28%	63%								81%
Upper Confidence Limit	%	36%	44%	35%	42%	68%								88%
Daily Geometric Mean	ppb	119.9	67.4	149.1	76.7	15.4								#N/A
Outflow Geo Mean - Composites	ppb	127.1	70.0	116.5	73.8	17.5								17.5
Upper Confidence Limit	ppb	135.3	83.92	123.0	86.8	24.5								24.5
Lower Confidence Limit	ppb	117.8	55.97	109.6	60.7	12.3								12.3
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%	91%								91%
Frequency Outflow Conc > 20 ppb	%	100%	100%	100%	100%	35%								65%
Frequency Outflow Conc > 50 ppb	%	100%	97%	100%	100%	1%								35%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	99%								99%
95th Percentile Outflow Conc	ppb	146	94	157	98	34								34
Mean Biomass P Storage	mg/m2	4272	3143	3471	3213	1155								2521
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%								0%
Net Storage Turnover Rate	1/yr	11.1	11.1	11.1	11.1	34.9								15.5
Unit Area P Removal	g/m2-yr	1357	1001	1105	1023	1153								1118
Mean Water Load	cm/d	8.7	5.3	13.1	6.0	5.5								2.4
Max Water Load	cm/d	95.0	65.0	142.6	70.1	67.1								26.2
Mean Depth	cm	86	48	45	47	65								58
Minimum Depth	cm	5	27	1	7	50								27
Maximum Depth	cm	112	97	119	100	116								109
Frequency Depth < 10 cm	%	0.1%	0.0%	13.4%	0.1%	0.0%								1.5%
Flow/Width	m2/day	135	76	203	87	145								126.4
HRT Days	days	9.9	8.9	3.4	7.8	11.8								24.3
Mean Velocity	cm/sec	0.18	0.19	0.52	0.21	0.26								0.26
Seepage Outflow / Total Outflow	%	12%	0%	9%	0%	0%								9%
Release 1 Outflow Volume	hm3/yr	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
95th Percentile Outflow Volume	hm3/d	0.42	0.41	0.61	0.60	1.00								1.0
95th Percentile Outflow Load	kg/d	55.43	35.75	82.25	54.64	31.13								31.1
Simulated / Specified Mean Depth	%	#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
Release 2 Demand Met	%	#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
Range Check - Mean Depth	-	1.12	-	-	-	-								1
Range Check - Freq Depth < 10 cm	-	-	-	1.50	-	-								1
Range Check - Flow/Width	-	-	-	-	-	0.89								1
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%
Mass Balance Error	%	0.01%	0.05%	0.10%	0.02%	0.04%								0.10%
Warning or Error Messages		Cell# 1 WDCW Depth out of calib. range for EMG_3: 86 vs. 35 - 76 cm Cell# 3 WDCE Freq Z < 10 cm out of calib. range for EMG_3: 13 vs. 0 - 9 % Cell# 5 6 Flow/Width out of calib. range for SAV_3: 145 vs. 162 - 374 m2/day												3

Table A.9 STA-2: Case "Exist"

DMSTA2- Inputs & Outputs Project: PROJECT_STA2 Model Release: 7/1/2005
Current Date: 08/03/05

Input Variable	Units	Value
Design Case Name	-	Exist
Input Series Name		TS_2006Base
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	7
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20
Cell Number -->		**1**
Cell Label	-	1
Vegetation Type	-->	PEW_3
Inflow Fraction	-	0.23
Downstream Cell Number	-	
Surface Area	km2	7.28
Mean Width of Flow Path	km	1.58
Number of Tanks in Series	-	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
Outflow Weir Depth	cm	
Outflow Coefficient - Exponent	-	4
Outflow Coefficient - Intercept	-	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
Outflow Seepage Control Elev	cm	-61
Max Outflow Seepage Conc	ppb	20
Seepage Recycle to Cell Number	-	1
Seepage Recycle Fraction	-	1
Seepage Discharge Fraction	-	
Initial Water Column Conc	ppb	30
Initial P Storage Per Unit Area	mg/m2	500
Initial Water Column Depth	cm	200
C0 = Conc at 0 g/m2 P Storage	ppb	3
C1 = Conc at 1 g/m2 P storage	ppb	22
C2 = Conc at Half-Max Uptake	ppb	300
K = Net Settling Rate at Steady State	m/yr	34.9
Z1 = Saturated Uptake Depth	cm	40
Z2 = Lower Penalty Depth	cm	100
Z3 = Upper Penalty Depth	cm	200

Case Description:
STA-2 Expanded to Include 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 prior to addition of Cell 4

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	27.8	33.8	22.5
GM Outflow C (ppb)	21.1	27.2	15.9
Load Reduction %	73%	67%	78%
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	3	0.0%
Warning/Error Messages	0	

Input Variable	Units	2	3	4	5	6	7	8	9	10	11	12
Cell Number -->		**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Cell Label	-	2	3									
Vegetation Type	-->	PEW_3	SAV_3									
Inflow Fraction	-	0.29	0.48									
Downstream Cell Number	-											
Surface Area	km2	9.19	9.19									
Mean Width of Flow Path	km	2.00	2.00									
Number of Tanks in Series	-	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	60									
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	0.006	0.01									
Outflow Seepage Control Elev	cm	-61	-30									
Max Outflow Seepage Conc	ppb	20	20									
Seepage Recycle to Cell Number	-	2	3									
Seepage Recycle Fraction	-	1	1									
Seepage Discharge Fraction	-											
Initial Water Column Conc	ppb	30	30	30								
Initial P Storage Per Unit Area	mg/m2	500	500	500								
Initial Water Column Depth	cm	200	200	200								
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3								
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22								
C2 = Conc at Half-Max Uptake	ppb	300	300	300								
K = Net Settling Rate at Steady State	m/yr	34.9	52.5	52.5								
Z1 = Saturated Uptake Depth	cm	40	40	40								
Z2 = Lower Penalty Depth	cm	100	100	100								
Z3 = Upper Penalty Depth	cm	200	200	200								

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	4.29	4.74	5.49										5.49
Run Date	-	08/03/05	08/03/05	08/03/05										08/03/05
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	97.5	122.9	203.4										423.8
Cell Inflow Load	kg/yr	9964	12564	20795										43323
Cell Inflow Conc	ppb	102.2	102.2	102.2										102.2
Treated Outflow Volume	hm3/yr	101.6	122.7	203.3										427.6
Treated Outflow Load	kg/yr	2820	3426	5627										11873
Treated FWM Outflow Conc	ppb	27.7	27.9	27.7										27.8
Upper Confidence Limit	ppb	34.5	34.6	33.0										33.8
Lower Confidence Limit	ppb	22.0	22.2	23.0										22.5
Total Outflow Volume + Bypass	hm3/yr	101.6	122.7	203.3										427.6
Total Outflow Load + Bypass	kg/yr	2820	3426	5627										11873.3
Total FWM Outflow Conc	ppb	27.7	27.9	27.7										27.8
Bypass Load	kg/yr	0	0	0										0.0
Bypass Load	%	0.0	0.0	0.0										0.0
Maximum Inflow	hm3/d	1.91	2.41	3.98										8.30
Maximum Outflow	hm3/d	1.95	2.46	4.09										8.50
Surface Load Reduction	kg/yr	7144	9138	15168										31450
Load Trapped in Sediments	kg/yr	7253	9043	14758										31054
Overall Load Reduction	%	72%	73%	73%										73%
Lower Confidence Limit	%	65%	66%	68%										67%
Upper Confidence Limit	%	78%	78%	78%										78%
Daily Geometric Mean	ppb	21.3	21.1	19.3										#N/A
Outflow Geo Mean - Composites	ppb	21.8	21.9	20.1										21.1
Upper Confidence Limit	ppb	28.4	28.49	25.4										27.2
Lower Confidence Limit	ppb	16.2	16.26	15.5										15.9
Frequency Outflow Conc > 10 ppb	%	100%	100%	99%										100%
Frequency Outflow Conc > 20 ppb	%	62%	63%	49%										90%
Frequency Outflow Conc > 50 ppb	%	0%	0%	0%										56%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%										100%
95th Percentile Outflow Conc	ppb	34	34	34										34
Mean Biomass P Storage	mg/m2	1501	1482	1609										1533
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	g/m2-yr	996	984	1606										1210
Mean Water Load	cm/d	3.7	3.7	6.1										4.5
Max Water Load	cm/d	26.2	26.2	43.3										32.3
Mean Depth	cm	58	57	70										62
Minimum Depth	cm	40	33	59										44
Maximum Depth	cm	105	105	120										110
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%										0.0%
Flow/Width	m2/day	169	168	278										207.9
HRT Days	days	15.8	15.5	11.6										13.7
Mean Velocity	cm/sec	0.34	0.34	0.46										0.38
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	1.01	1.27	2.18										4.4
95th Percentile Outflow Load	kg/d	33.24	41.53	72.33										146.5
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
Range Check - Inflow Conc	-	-	-	-										0
Range Check - Outflow Conc	-	-	-	-										0
Water Balance Error	%	0.00%	0.00%	0.00%										0.00%
Mass Balance Error	%	0.02%	0.02%	0.16%										0.09%
Warning or Error Messages														0

Table A.10 STA-2: Case "2006 Base"

DMSTA2- Inputs & Outputs **Project: PROJECT_STA2** Model Release: 7/1/2005
Current Date: 08/03/05

Input Variable	Units	Value
Design Case Name	-	2006_Base
Input Series Name		TS_2006Base
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	7
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-2 Expanded to Include 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 following addition of Cell 4
Cell 4 data taken from May 2005 BODR by Brown & Caldwell; net cell area 1,900 acres

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	21.0	25.7	17.1
GM Outflow C (ppb)	15.0	19.7	11.2
Load Reduction %	79%	75%	83%
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	2	0.6%
Warning/Error Messages	2	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1	2	3	4								
Vegetation Type	-->	PEW_3	PEW_3	SAV_3	SAV_3								
Inflow Fraction	-	0.165	0.21	0.365	0.26								
Downstream Cell Number	-												
Surface Area	km2	7.28	9.19	9.19	7.70								
Mean Width of Flow Path	km	1.58	2.00	2.00	2.50								
Number of Tanks in Series	-	3.0	3.0	6.0	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	42								
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	0.008			0.004								
Inflow Seepage Control Elev	cm	76			67								
Inflow Seepage Conc	ppb	20			20								
Outflow Seepage Rate	(cm/d) / cm	0.004	0.006	0.00337	0.0037								
Outflow Seepage Control Elev	cm	-61	-61	-30	12								
Max Outflow Seepage Conc	ppb	20	20	20	20								
Seepage Recycle to Cell Number	-	1	2	3	4								
Seepage Recycle Fraction	-	1	1	1	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	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	3.29	3.80	4.57	5.09									5.09
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05									08/03/05
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		1	2	3	4									Total
Downstream Cell Label		Outflow	Outflow	Outflow	Outflow									-
Network Simulation Name	-	none	none	none	none									none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta									Uncerta
Surface Area	km2	7.28	9.19	9.19	7.70									33.36
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	69.9	89.0	154.7	110.2									423.8
Cell Inflow Load	kg/yr	7148	9098	15813	11264									43323
Cell Inflow Conc	ppb	102.2	102.2	102.2	102.2									102.2
Treated Outflow Volume	hm3/yr	74.5	88.8	154.5	110.8									428.7
Treated Outflow Load	kg/yr	1527	1860	3257	2341									8985
Treated FWM Outflow Conc	ppb	20.5	20.9	21.1	21.1									21.0
Upper Confidence Limit	ppb	26.0	26.4	25.7	25.1									25.7
Lower Confidence Limit	ppb	16.2	16.6	17.4	17.9									17.1
Total Outflow Volume + Bypass	hm3/yr	74.5	88.8	154.5	110.8									428.7
Total Outflow Load + Bypass	kg/yr	1527	1860	3257	2341									8985.4
Total FWM Outflow Conc	ppb	20.5	20.9	21.1	21.1									21.0
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	1.37	1.74	3.03	2.16									8.30
Maximum Outflow	hm3/d	1.39	1.76	3.13	2.23									8.52
Surface Load Reduction	kg/yr	5621	7238	12556	8923									34338
Load Trapped in Sediments	kg/yr	5817	7283	12663	9135									34898
Overall Load Reduction	%	79%	80%	79%	79%									79%
Lower Confidence Limit	%	73%	74%	75%	75%									75%
Upper Confidence Limit	%	83%	84%	83%	82%									83%
Daily Geometric Mean	ppb	15.2	15.2	13.4	13.7									#N/A
Outflow Geo Mean - Composites	ppb	15.5	16.0	14.1	14.5									15.0
Upper Confidence Limit	ppb	20.9	21.43	18.5	18.4									19.7
Lower Confidence Limit	ppb	11.4	11.79	10.5	11.4									11.2
Frequency Outflow Conc > 10 ppb	%	97%	97%	83%	87%									92%
Frequency Outflow Conc > 20 ppb	%	17%	20%	18%	18%									45%
Frequency Outflow Conc > 50 ppb	%	0%	0%	0%	0%									17%
Freq Outflow Volume > 10 ppb	%	99%	99%	97%	97%									98%
95th Percentile Outflow Conc	ppb	25	26	27	27									26
Mean Biomass P Storage	mg/m2	1204	1194	1380	1189									1246
Storage Increase / Net Removal	%	0%	0%	0%	0%									0%
Net Storage Turnover Rate	1/yr	23.2	23.2	34.9	34.9									29.4
Unit Area P Removal	g/m2-yr	799	793	1378	1187									1046
Mean Water Load	cm/d	2.6	2.7	4.6	3.9									3.5
Max Water Load	cm/d	18.8	19.0	33.0	28.0									24.9
Mean Depth	cm	55	53	68	54									58
Minimum Depth	cm	40	27	57	40									41
Maximum Depth	cm	97	97	112	97									101
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%									0.0%
Flow/Width	m2/day	121	122	212	121									146.2
HRT Days	days	20.7	20.2	14.8	13.8									16.6
Mean Velocity	cm/sec	0.26	0.26	0.36	0.26									0.29
Seepage Outflow / Total Outflow	%	0%	0%	0%	1%									0%
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	0.71	0.90	1.65	1.16									4.4
95th Percentile Outflow Load	kg/d	17.83	22.51	42.69	30.29									113.0
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	-	-	-	-	0.87									1
Range Check - Freq Depth < 10 cm	-	-	-	-	-									0
Range Check - Flow/Width	-	-	-	-	0.75									1
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%	0.12%	0.03%									0.06%
Warning or Error Messages														2

Cell# 4 4 Depth out of calib. range for SAV_3: 54 vs. 62 - 87 cm
Cell# 4 4 Flow/Width out of calib. range for SAV_3: 121 vs. 162 - 374 m2/day

Table A.11: STA-3/4: Cells 1A and 1B: Case "ST3_06Base"

DMSTA2- Inputs & Outputs Project: PROJECT_STA34 Model Release: 7/1/2005 Current Date: 08/03/05

Input Variable	Units	Value
Design Case Name	-	ST3_06Base
Input Series Name		TS_ST306Bas
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	7
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-3/4; Cells 1A and 1B only
Inflows limited to those from North New River Canal at G-370
Includes S-2/S-7 Basin runoff and Lake flow-through releases at S-351
Lake water supply releases to low WCA excluded from treatment area inflows.

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	25.3	31.4	19.9
GM Outflow C (ppb)	21.2	27.3	16.0
Load Reduction %	69%	61%	75%
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	1	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B										
Vegetation Type	-->	EMG_3	PEW_3										
Inflow Fraction	-	1											
Downstream Cell Number	-	2											
Surface Area	km2	12.30	14.12										
Mean Width of Flow Path	km	3.42	4.50										
Number of Tanks in Series	-	6.0	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										
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	0.0058	0.0029										
Outflow Seepage Control Elev	cm	16	40										
Max Outflow Seepage Conc	ppb	20	20										
Seepage Recycle to Cell Number	-	1	1										
Seepage Recycle Fraction	-	0.5	0.5										
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										
C1 = Conc at 1 g/m2 P storage	ppb	22	22										
C2 = Conc at Half-Max Uptake	ppb	300	300										
K = Net Settling Rate at Steady State	m/yr	16.8	34.9										
Z1 = Saturated Uptake Depth	cm	40	40										
Z2 = Lower Penalty Depth	cm	100	100										
Z3 = Upper Penalty Depth	cm	200	200										

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	3.60	4.06											4.06
Run Date	-	08/03/05	08/03/05											08/03/05
Starting Date for Simulation	-	05/01/65	05/01/65											05/01/65
Starting Date for Output	-	05/01/65	05/01/65											05/01/65
Ending Date	-	04/30/00	04/30/00											04/30/00
Output Duration	days	12784	12784											12784
Cell Label		1A	1B											Total
Downstream Cell Label		1B	Outflow											-
Network Simulation Name	-	none	none											none
Simulation Type	-	Uncerta	Uncerta											Uncerta
Surface Area	km2	12.30	14.12											26.41
Mean Rainfall	cm/yr	130.0	130.0											130.0
Mean ET	cm/yr	134.9	134.9											134.9
Cell Inflow Volume	hm3/yr	355.0	349.5											355.0
Cell Inflow Load	kg/yr	27893	18656											27893
Cell Inflow Conc	ppb	78.6	53.4											78.6
Treated Outflow Volume	hm3/yr	349.5	345.0											345.0
Treated Outflow Load	kg/yr	18656	8722											8722
Treated FWM Outflow Conc	ppb	53.4	25.3											25.3
Upper Confidence Limit	ppb	57.9	31.4											31.4
Lower Confidence Limit	ppb	48.2	19.9											19.9
Total Outflow Volume + Bypass	hm3/yr	349.5	345.0											345.0
Total Outflow Load + Bypass	kg/yr	18656	8722											8721.9
Total FWM Outflow Conc	ppb	53.4	25.3											25.3
Bypass Load	kg/yr	0	0											0.0
Bypass Load	%	0.0	0.0											0.0
Maximum Inflow	hm3/d	4.95	4.90											4.95
Maximum Outflow	hm3/d	4.90	5.27											5.27
Surface Load Reduction	kg/yr	9237	9934											19171
Load Trapped in Sediments	kg/yr	8996	10284											19280
Overall Load Reduction	%	33%	53%											69%
Lower Confidence Limit	%	27%	47%											61%
Upper Confidence Limit	%	40%	59%											75%
Daily Geometric Mean	ppb	46.1	18.5											#N/A
Outflow Geo Mean - Composites	ppb	47.0	21.2											21.2
Upper Confidence Limit	ppb	52.2	27.31											27.3
Lower Confidence Limit	ppb	41.3	16.01											16.0
Frequency Outflow Conc > 10 ppb	%	100%	99%											99%
Frequency Outflow Conc > 20 ppb	%	100%	62%											89%
Frequency Outflow Conc > 50 ppb	%	37%	0%											62%
Freq Outflow Volume > 10 ppb	%	100%	100%											100%
95th Percentile Outflow Conc	ppb	60	32											32
Mean Biomass P Storage	mg/m2	2297	1098											1656
Storage Increase / Net Removal	%	0%	0%											0%
Net Storage Turnover Rate	1/yr	11.1	23.2											15.4
Unit Area P Removal	g/m2-yr	732	729											730
Mean Water Load	cm/d	7.9	6.8											3.7
Max Water Load	cm/d	40.3	34.7											18.8
Mean Depth	cm	68	65											67
Minimum Depth	cm	27	21											24
Maximum Depth	cm	109	103											106
Frequency Depth < 10 cm	%	0.0%	0.0%											0.0%
Flow/Width	m2/day	284	213											246.0
HRT Days	days	8.6	9.6											18.1
Mean Velocity	cm/sec	0.48	0.38											0.43
Seepage Outflow / Total Outflow	%	2%	1%											2%
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	3.26	3.18											3.2
95th Percentile Outflow Load	kg/d	186.57	94.22											94.2
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	-	1.35	-											1
Range Check - Inflow Conc	-	-	-											0
Range Check - Outflow Conc	-	-	-											0
Water Balance Error	%	0.00%	0.00%											0.00%
Mass Balance Error	%	0.13%	0.02%											0.15%
Warning or Error Messages		Cell# 1 1A Flow/Width out of calib. range for EMG_3: 284 vs. 26 - 210 m2/day												1

Table A.12 STA-3/4: Cells 2 &4: Case "ST4_06Base"

DMSTA2- Inputs & Outputs Project: PROJECT_STA34 Model Release: 7/1/2005 Current Date: 08/03/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	ST4_06Base	STA-3/4; Cells 1A and 1B excluded
Input Series Name	-	TS_ST406Base	Inflows limited to those from Miami Canal at G-372
Starting Date for Simulation	-	05/01/65	Includes S-3/S-8, SSDD, SFCD and G136SO Basin runoff and Lake flow-through releases at S-354
Ending Date for Simulation	-	04/30/00	Lake water supply releases to low WCA and to Big Cypress Reservation excluded from treatment area inflows.
Starting Date for Output	-	05/01/65	
Integration Steps Per Day	-	4	
Number of Iterations	-	0	
Output Averaging Interval	days	7	
Inflow Conc Scale Factor	-	1	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Simulation Type:	Uncertainty Analysis		
Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	18.2	22.1	15.1
GM Outflow C (ppb)	13.2	16.8	10.3
Load Reduction %	79%	75%	83%
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	-	2A	2B	3A	3B								
Vegetation Type	-->	EMG_3	SAV_3	EMG_3	SAV_3								
Inflow Fraction	-	0.54		0.46									
Downstream Cell Number	-	2		4									
Surface Area	km2	10.29	11.71	9.61	8.92								
Mean Width of Flow Path	km	2.89	4.02	4.88	4.88								
Number of Tanks in Series	-	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								
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												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0014		0.0038									
Outflow Seepage Control Elev	cm	-67		-64									
Max Outflow Seepage Conc	ppb	20		20									
Seepage Recycle to Cell Number	-	1		3									
Seepage Recycle Fraction	-	0.5		0.5									
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	16.8	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	6.20	6.71	7.31	7.89									7.89
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05									08/03/05
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		2A	2B	3A	3B									Total
Downstream Cell Label		2B	Outflow	3B	Outflow									-
Network Simulation Name	-	none	none	none	none									none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta									Uncerta
Surface Area	km2	10.29	11.71	9.61	8.92									40.53
Mean Rainfall	cm/yr	130.0	130.0	130.0	130.0									130.0
Mean ET	cm/yr	134.9	134.9	134.9	134.9									134.9
Cell Inflow Volume	hm3/yr	236.6	232.6	201.6	192.9									438.2
Cell Inflow Load	kg/yr	20004	12295	17040	9847									37044
Cell Inflow Conc	ppb	84.5	52.9	84.5	51.1									84.5
Treated Outflow Volume	hm3/yr	232.6	232.1	192.9	192.4									424.5
Treated Outflow Load	kg/yr	12295	4179	9847	3563									7741
Treated FWM Outflow Conc	ppb	52.9	18.0	51.1	18.5									18.2
Upper Confidence Limit	ppb	58.4	21.8	56.5	22.4									22.1
Lower Confidence Limit	ppb	46.8	14.9	45.2	15.4									15.1
Total Outflow Volume + Bypass	hm3/yr	232.6	232.1	192.9	192.4									424.5
Total Outflow Load + Bypass	kg/yr	12295	4179	9847	3563									7741.3
Total FWM Outflow Conc	ppb	52.9	18.0	51.1	18.5									18.2
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	5.02	4.95	4.28	4.22									9.31
Maximum Outflow	hm3/d	4.95	4.97	4.22	4.29									9.26
Surface Load Reduction	kg/yr	7709	8116	7194	6284									29303
Load Trapped in Sediments	kg/yr	7690	8500	6757	6570									29517
Overall Load Reduction	%	39%	66%	42%	64%									79%
Lower Confidence Limit	%	32%	63%	36%	60%									75%
Upper Confidence Limit	%	46%	68%	49%	66%									83%
Daily Geometric Mean	ppb	44.2	10.4	42.8	10.1									#N/A
Outflow Geo Mean - Composites	ppb	45.2	13.1	46.1	13.5									13.2
Upper Confidence Limit	ppb	51.4	16.71	51.9	17.2									16.8
Lower Confidence Limit	ppb	38.6	10.25	39.9	10.6									10.3
Frequency Outflow Conc > 10 ppb	%	100%	74%	100%	76%									74%
Frequency Outflow Conc > 20 ppb	%	100%	13%	100%	16%									41%
Frequency Outflow Conc > 50 ppb	%	27%	0%	31%	0%									14%
Freq Outflow Volume > 10 ppb	%	100%	92%	100%	92%									92%
95th Percentile Outflow Conc	ppb	59	23	59	24									24
Mean Biomass P Storage	mg/m2	2347	727	2207	738									1491
Storage Increase / Net Removal	%	0%	0%	0%	0%									0%
Net Storage Turnover Rate	1/yr	11.1	34.9	11.1	34.9									17.1
Unit Area P Removal	g/m2-yr	748	726	703	737									728
Mean Water Load	cm/d	6.3	5.4	5.7	5.9									3.0
Max Water Load	cm/d	48.8	42.2	44.5	47.3									23.0
Mean Depth	cm	66	63	59	60									62
Minimum Depth	cm	27	7	9	2									12
Maximum Depth	cm	114	105	96	97									103
Frequency Depth < 10 cm	%	0.0%	0.1%	0.1%	0.2%									0.1%
Flow/Width	m2/day	224	158	113	108									153.3
HRT Days	days	10.5	11.6	10.4	10.2									21.0
Mean Velocity	cm/sec	0.39	0.29	0.22	0.21									0.28
Seepage Outflow / Total Outflow	%	1%	0%	4%	0%									3%
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	2.30	2.27	1.95	1.97									4.2
95th Percentile Outflow Load	kg/d	128.67	47.27	107.14	42.03									89.5
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	-	-	-	-	0.97									1
Range Check - Freq Depth < 10 cm	-	-	-	-	-									0
Range Check - Flow/Width	-	1.07	0.98	-	0.67									3
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	%	0.12%	0.02%	0.06%	0.08%									0.12%
Warning or Error Messages		Cell# 1 2A Flow/Width out of calib. range for EMG_3: 224 vs. 26 - 210 m2/day												4
		Cell# 2 2B Flow/Width out of calib. range for SAV_3: 158 vs. 162 - 374 m2/day												
		Cell# 4 3B Depth out of calib. range for SAV_3: 60 vs. 62 - 87 cm												
		Cell# 4 3B Flow/Width out of calib. range for SAV_3: 108 vs. 162 - 374 m2/day												

Table A.13 STA-3/4: Case "2006 Base"

DMSTA2- Inputs & Outputs Project: PROJECT_STA34 Model Release: 7/1/2005 Current Date: 08/03/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2006 Base	STA-3/4, all cells
Input Series Name		TS_All06Base	All inflows
Starting Date for Simulation	-	05/01/65	Lake water supply releases to low WCA and to Big Cypress Reservation excluded from treatment area inflows.
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	7	
Inflow Conc Scale Factor	-	1	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Simulation Type:	Uncertainty Analysis		
Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	20.1	24.8	16.2
GM Outflow C (ppb)	15.6	20.1	11.9
Load Reduction %	76%	71%	81%
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	PEW_3	EMG_3	SAV_3	EMG_3	SAV_3						
Inflow Fraction	-	0.34		0.36		0.3							
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	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	8.31	8.80	9.60	10.09	10.69	11.29							11.29
Run Date	-	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05	08/03/05							08/03/05
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	-	none	none	none	none	none	none							none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta							Uncerta
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	269.7	264.3	285.6	289.6	238.0	221.2							793.2
Cell Inflow Load	kg/yr	22079	13076	23377	15734	19481	11734							64937
Cell Inflow Conc	ppb	81.9	49.5	81.9	54.3	81.9	53.0							81.9
Treated Outflow Volume	hm3/yr	264.3	260.2	289.6	289.0	221.2	220.8							770.0
Treated Outflow Load	kg/yr	13076	5266	15734	5783	11734	4412							15460
Treated FWM Outflow Conc	ppb	49.5	20.2	54.3	20.0	53.0	20.0							20.1
Upper Confidence Limit	ppb	55.0	25.8	59.1	24.3	58.1	24.3							24.8
Lower Confidence Limit	ppb	43.4	15.7	48.9	16.4	47.4	16.4							16.2
Total Outflow Volume + Bypass	hm3/yr	264.3	260.2	289.6	289.0	221.2	220.8							770.0
Total Outflow Load + Bypass	kg/yr	13076	5266	15734	5783	11734	4412							15460.5
Total FWM Outflow Conc	ppb	49.5	20.2	54.3	20.0	53.0	20.0							20.1
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	4.34	4.14	4.60	4.38	3.83	3.63							12.77
Maximum Outflow	hm3/d	4.14	4.25	4.38	4.56	3.63	3.76							12.58
Surface Load Reduction	kg/yr	9003	7810	7644	9951	7748	7322							49477
Load Trapped in Sediments	kg/yr	8821	8191	7774	10334	6951	7608							49680
Overall Load Reduction	%	41%	60%	33%	63%	40%	62%							76%
Lower Confidence Limit	%	34%	54%	27%	59%	34%	58%							71%
Upper Confidence Limit	%	48%	64%	39%	67%	46%	65%							81%
Daily Geometric Mean	ppb	42.2	14.0	47.1	13.1	48.4	12.0							#N/A
Outflow Geo Mean - Composites	ppb	43.0	16.4	48.0	15.6	49.0	15.5							15.6
Upper Confidence Limit	ppb	49.1	21.88	53.3	19.7	54.5	19.7							20.1
Lower Confidence Limit	ppb	36.5	12.09	42.0	12.2	43.1	12.2							11.9
Frequency Outflow Conc > 10 ppb	%	100%	93%	100%	89%	100%	87%							89%
Frequency Outflow Conc > 20 ppb	%	100%	28%	100%	27%	100%	28%							58%
Frequency Outflow Conc > 50 ppb	%	19%	0%	39%	0%	46%	0%							26%
Freq Outflow Volume > 10 ppb	%	100%	98%	100%	97%	100%	95%							97%
95th Percentile Outflow Conc	ppb	55	26	60	26	60	26							26
Mean Biomass P Storage	mg/m2	2252	874	2372	884	2271	854							1557
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%							0%
Net Storage Turnover Rate	1/yr	11.1	23.2	11.1	34.9	11.1	34.9							16.7
Unit Area P Removal	g/m2-yr	717	580	755	883	723	853							742
Mean Water Load	cm/d	6.0	5.1	7.6	6.8	6.8	6.8							3.2
Max Water Load	cm/d	35.3	29.3	44.7	37.4	39.8	40.7							19.1
Mean Depth	cm	66	63	70	65	58	61							64
Minimum Depth	cm	29	13	45	23	1	5							20
Maximum Depth	cm	105	99	111	103	93	94							101
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	1.2%	0.1%							0.2%
Flow/Width	m2/day	216	161	271	197	134	124							185.4
HRT Days	days	11.0	12.2	9.2	9.7	8.6	9.0							19.8
Mean Velocity	cm/sec	0.38	0.30	0.45	0.35	0.26	0.23							0.33
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	2.47	2.50	2.66	2.65	2.16	2.20							7.3
95th Percentile Outflow Load	kg/d	129.98	59.38	153.31	64.61	120.40	52.00							176.1
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	-	-	-	-	-	-	0.99							1
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-							0
Range Check - Flow/Width	-	1.03	-	1.29	-	-	0.77							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%	0.11%	0.02%	0.02%	0.06%							0.09%
Warning or Error Messages		Cell# 1 1A Flow/Width out of calib. range for EMG_3: 216 vs. 26 - 210 m2/day Cell# 3 2A Flow/Width out of calib. range for EMG_3: 271 vs. 26 - 210 m2/day Cell# 6 3B Depth out of calib. range for SAV_3: 61 vs. 62 - 87 cm Cell# 6 3B Flow/Width out of calib. range for SAV_3: 124 vs. 162 - 374 m2/day												4

Table A.14 STA-5: Case "Exist"

DMSTA2- Inputs & Outputs Project: PROJECT_STA5 Model Release: 7/1/2005
Current Date: 08/04/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	Exist	Existing STA-5, WY 2002-2005
Input Series Name		TS_Exist	Used Inflow Volumes as for C-139 Basin total to L-3, reduced by measured bypas at G-406
Starting Date for Simulation	-	05/01/01	Used Historic Inflow Concentrations (increased concentrations in data file by 11%; had been reduced by 10% for BMPs)
Ending Date for Simulation	-	04/30/05	
Starting Date for Output	-	05/01/01	
Integration Steps Per Day	-	4	
Number of Iterations	-	0	
Output Averaging Interval	days	7	
Inflow Conc Scale Factor	-	1.11	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Simulation Type:	Uncertainty Analysis		
Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	66.5	82.1	51.6
GM Outflow C (ppb)	62.3	77.5	47.7
Load Reduction %	73%	66%	79%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.1%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.7%
Warning/Error Messages	1	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	2A	2B								
Vegetation Type	-->	EMG_3	SAV_3	EMG_3	EMG_3								
Inflow Fraction	-	0.5		0.5									
Downstream Cell Number	-	2		4									
Surface Area	km2	3.38	4.94	3.38	4.94								
Mean Width of Flow Path	km	1.56	1.56	1.56	1.56								
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	40	60	40	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												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0075	0.0075	0.0075	0.0075								
Outflow Seepage Control Elev	cm	-46	-38	-46	-38								
Max Outflow Seepage Conc	ppb	20	20	20	20								
Seepage Recycle to Cell Number	-	1	1	3	3								
Seepage Recycle Fraction	-	1	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	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	16.8	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	11.50	12.50	13.25	14.25									14.25
Run Date	-	08/04/05	08/04/05	08/04/05	08/04/05									08/04/05
Starting Date for Simulation	-	05/01/01	05/01/01	05/01/01	05/01/01									05/01/01
Starting Date for Output	-	05/01/01	05/01/01	05/01/01	05/01/01									05/01/01
Ending Date	-	04/30/05	04/30/05	04/30/05	04/30/05									04/30/05
Output Duration	days	1461	1461	1461	1461									1461
Cell Label		1A	1B	2A	2B									Total
Downstream Cell Label		1B	Outflow	2B	Outflow									-
Network Simulation Name	-	none	none	none	none									none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta									Uncerta
Surface Area	km2	3.38	4.94	3.38	4.94									16.63
Mean Rainfall	cm/yr	0.0	0.0	0.0	0.0									0.0
Mean ET	cm/yr	0.0	0.0	0.0	0.0									0.0
Cell Inflow Volume	hm3/yr	92.9	107.0	92.9	107.0									185.8
Cell Inflow Load	kg/yr	22545	16408	22545	16408									45089
Cell Inflow Conc	ppb	242.6	153.4	242.6	153.4									242.6
Treated Outflow Volume	hm3/yr	107.0	92.8	107.0	92.8									185.7
Treated Outflow Load	kg/yr	16408	3580	16408	8758									12338
Treated FWM Outflow Conc	ppb	153.4	38.6	153.4	94.3									66.5
Upper Confidence Limit	ppb	163.3	51.1	163.3	113.1									82.1
Lower Confidence Limit	ppb	141.6	28.3	141.6	74.9									51.6
Total Outflow Volume + Bypass	hm3/yr	107.0	92.8	107.0	92.8									185.7
Total Outflow Load + Bypass	kg/yr	16408	3580	16408	8758									12337.9
Total FWM Outflow Conc	ppb	153.4	38.6	153.4	94.3									66.5
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	0.96	1.02	0.96	1.02									1.93
Maximum Outflow	hm3/d	1.02	0.94	1.02	0.94									1.89
Surface Load Reduction	kg/yr	6137	12828	6137	7650									32751
Load Trapped in Sediments	kg/yr	5249	12051	5249	6242									28791
Overall Load Reduction	%	27%	78%	27%	47%									73%
Lower Confidence Limit	%	23%	73%	23%	40%									66%
Upper Confidence Limit	%	33%	83%	33%	54%									79%
Daily Geometric Mean	ppb	139.5	33.5	139.5	88.8									#N/A
Outflow Geo Mean - Composites	ppb	139.6	34.5	139.6	89.8									62.3
Upper Confidence Limit	ppb	147.5	46.90	147.5	108.0									77.5
Lower Confidence Limit	ppb	129.3	24.42	129.3	70.8									47.7
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%									100%
Frequency Outflow Conc > 20 ppb	%	100%	100%	100%	100%									100%
Frequency Outflow Conc > 50 ppb	%	100%	4%	100%	100%									100%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%									100%
95th Percentile Outflow Conc	ppb	184	48	184	106									77
Mean Biomass P Storage	mg/m2	4875	2444	4875	3969									3885
Storage Increase / Net Removal	%	0%	0%	0%	0%									0%
Net Storage Turnover Rate	1/yr	1.3	4.0	1.3	1.3									1.8
Unit Area P Removal	g/m2-yr	1553	2441	1553	1264									1731
Mean Water Load	cm/d	7.5	5.9	7.5	5.9									3.1
Max Water Load	cm/d	28.5	20.6	28.5	20.6									11.6
Mean Depth	cm	60	66	60	66									64
Minimum Depth	cm	39	55	39	55									49
Maximum Depth	cm	90	88	90	88									89
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%									0.0%
Flow/Width	m2/day	163	188	163	188									177.7
HRT Days	days	8.0	11.2	8.0	11.2									20.9
Mean Velocity	cm/sec	0.32	0.33	0.32	0.33									0.32
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%									0%
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	0.78	0.74	0.78	0.74									1.5
95th Percentile Outflow Load	kg/d	139.19	31.58	139.19	71.65									101.8
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	-	-	-	-	-									0
Range Check - Inflow Conc	-	-	1.00	-	-									1
Range Check - Outflow Conc	-	-	-	-	-									0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%									0.09%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%									0.01%
Warning or Error Messages		Cell# 2 1B Inflow Conc out of calib. range for SAV_3: 153 vs. 15 - 153 ppb												1

Table A.15 STA-5: Case "Exist All Emerg"

DMSTA2- Inputs & Outputs Project: PROJECT_STA5 Model Release: 7/1/2005
Current Date: 08/04/05

Input Variable	Units	Value
Design Case Name	-	Exist All Emerg
Input Series Name		TS_Exist
Starting Date for Simulation	-	05/01/01
Ending Date for Simulation	-	04/30/05
Starting Date for Output	-	05/01/01
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	7
Inflow Conc Scale Factor	-	1.11
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
Existing STA-5, WY 2002-2005
Used Inflow Volumes as for C-139 Basin total to L-3, reduced by recorded bypass at G-406
Used Historic Inflow Concentrations (increased concentrations in data file by 11%; had been reduced by 10% for BMPs)

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	94.3	113.1	74.9
GM Outflow C (ppb)	89.8	108.0	70.8
Load Reduction %	61%	53%	69%
Bypass Load (%)	0.0%		

Uncertainty Analysis

Diagnostics		
H20 Balance Error Mean & Max	0.1%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	3	0.6%
Warning/Error Messages	0	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	1A	1B	2A	2B								
Vegetation Type	-->	EMG_3	EMG_3	EMG_3	EMG_3								
Inflow Fraction	-	0.5		0.5									
Downstream Cell Number	-	2		4									
Surface Area	km2	3.38	4.94	3.38	4.94								
Mean Width of Flow Path	km	1.56	1.56	1.56	1.56								
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	40	60	40	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												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0075	0.0075	0.0075	0.0075								
Outflow Seepage Control Elev	cm	-46	-38	-46	-38								
Max Outflow Seepage Conc	ppb	20	20	20	20								
Seepage Recycle to Cell Number	-	1	1	3	3								
Seepage Recycle Fraction	-	1	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	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	16.8	16.8	16.8	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	12.25	13.25	14.25	15.50									15.50
Run Date	-	08/04/05	08/04/05	08/04/05	08/04/05									08/04/05
Starting Date for Simulation	-	05/01/01	05/01/01	05/01/01	05/01/01									05/01/01
Starting Date for Output	-	05/01/01	05/01/01	05/01/01	05/01/01									05/01/01
Ending Date	-	04/30/05	04/30/05	04/30/05	04/30/05									04/30/05
Output Duration	days	1461	1461	1461	1461									1461
Cell Label		1A	1B	2A	2B									Total
Downstream Cell Label		1B	Outflow	2B	Outflow									-
Network Simulation Name	-	none	none	none	none									none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta									Uncerta
Surface Area	km2	3.38	4.94	3.38	4.94									16.63
Mean Rainfall	cm/yr	0.0	0.0	0.0	0.0									0.0
Mean ET	cm/yr	0.0	0.0	0.0	0.0									0.0
Cell Inflow Volume	hm3/yr	92.9	107.0	92.9	107.0									185.8
Cell Inflow Load	kg/yr	22545	16408	22545	16408									45089
Cell Inflow Conc	ppb	242.6	153.4	242.6	153.4									242.6
Treated Outflow Volume	hm3/yr	107.0	92.8	107.0	92.8									185.7
Treated Outflow Load	kg/yr	16408	8758	16408	8758									17517
Treated FWM Outflow Conc	ppb	153.4	94.3	153.4	94.3									94.3
Upper Confidence Limit	ppb	163.3	113.1	163.3	113.1									113.1
Lower Confidence Limit	ppb	141.6	74.9	141.6	74.9									74.9
Total Outflow Volume + Bypass	hm3/yr	107.0	92.8	107.0	92.8									185.7
Total Outflow Load + Bypass	kg/yr	16408	8758	16408	8758									17516.6
Total FWM Outflow Conc	ppb	153.4	94.3	153.4	94.3									94.3
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	0.96	1.02	0.96	1.02									1.93
Maximum Outflow	hm3/d	1.02	0.94	1.02	0.94									1.89
Surface Load Reduction	kg/yr	6137	7650	6137	7650									27573
Load Trapped in Sediments	kg/yr	5249	6242	5249	6242									22982
Overall Load Reduction	%	27%	47%	27%	47%									61%
Lower Confidence Limit	%	23%	40%	23%	40%									53%
Upper Confidence Limit	%	33%	54%	33%	54%									69%
Daily Geometric Mean	ppb	139.5	88.8	139.5	88.8									#N/A
Outflow Geo Mean - Composites	ppb	139.6	89.8	139.6	89.8									89.8
Upper Confidence Limit	ppb	147.5	107.98	147.5	108.0									108.0
Lower Confidence Limit	ppb	129.3	70.80	129.3	70.8									70.8
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%									100%
Frequency Outflow Conc > 20 ppb	%	100%	100%	100%	100%									100%
Frequency Outflow Conc > 50 ppb	%	100%	100%	100%	100%									100%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%									100%
95th Percentile Outflow Conc	ppb	184	106	184	106									106
Mean Biomass P Storage	mg/m2	4875	3969	4875	3969									4337
Storage Increase / Net Removal	%	0%	0%	0%	0%									0%
Net Storage Turnover Rate	1/yr	1.3	1.3	1.3	1.3									1.3
Unit Area P Removal	g/m2-yr	1553	1264	1553	1264									1382
Mean Water Load	cm/d	7.5	5.9	7.5	5.9									3.1
Max Water Load	cm/d	28.5	20.6	28.5	20.6									11.6
Mean Depth	cm	60	66	60	66									64
Minimum Depth	cm	39	55	39	55									49
Maximum Depth	cm	90	88	90	88									89
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%									0.0%
Flow/Width	m2/day	163	188	163	188									177.7
HRT Days	days	8.0	11.2	8.0	11.2									20.9
Mean Velocity	cm/sec	0.32	0.33	0.32	0.33									0.32
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%									0%
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	0.78	0.74	0.78	0.74									1.5
95th Percentile Outflow Load	kg/d	139.19	71.65	139.19	71.65									143.3
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	-	-	-	-	-									0
Range Check - Inflow Conc	-	-	-	-	-									0
Range Check - Outflow Conc	-	-	-	-	-									0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%									0.09%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%									0.01%
Warning or Error Messages														0

Table A.16 STA-5: Case "2006 Base"

DMSTA2- Inputs & Outputs Project: PROJECT_STA5 Model Release: 7/1/2005
Current Date: 08/04/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2006 Base	STA-5 expanded to include Flow-Way 3; no bypass to STA-6 (max. daily inflow 1,575 cfs during period WY 1995-2005)
Input Series Name	-	TS_Base	2006-2009; downstream cells considered as SAV_3
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	Flow-Way 3 generally based on April 2005 Draft BODR; bypass directed to STA-6
Starting Date for Output	-	05/01/94	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	Output Variable / Mean / Lower CL / Upper CL
Output Averaging Interval	days	7	FWM Outflow C (ppb) 22.1 29.6 16.7
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 16.2 23.2 11.2
Rainfall P Conc	ppb	10	Load Reduction % 90% 86% 92%
Atmospheric P Load (Dry)	mg/m2-yr	20	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	-	1A	1B	2A	2B	3A	3B						
Vegetation Type	-->	EMG_3	SAV_3	EMG_3	SAV_3	EMG_3	SAV_3						
Inflow Fraction	-	0.3333		0.3333		0.3333							
Downstream Cell Number	-	2		4		6							
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71						
Mean Width of Flow Path	km	1.56	1.56	1.56	1.56	1.56	1.56						
Number of Tanks in Series	-	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						
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	0.0075	0.0075			0.0075	0.0075						
Outflow Seepage Control Elev	cm	-46	-38										
Max Outflow Seepage Conc	ppb	20	20			20	20						
Seepage Recycle to Cell Number	-	1	2			5	6						
Seepage Recycle Fraction	-	1	1										
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	8.91	9.54	10.09	10.64	11.27	11.82							11.82
Run Date	-	08/04/05	08/04/05	08/04/05	08/04/05	08/04/05	08/04/05							08/04/05
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
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
Ending Date	-	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
Cell Label		1A	1B	2A	2B	3A	3B							Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow							-
Network Simulation Name	-	none	none	none	none	none	none							none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta							Uncerta
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71							24.95
Mean Rainfall	cm/yr	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
Cell Inflow Volume	hm3/yr	65.4	65.4	65.4	65.4	65.4	59.2							196.3
Cell Inflow Load	kg/yr	13047	7696	13048	8283	13047	6259							39143
Cell Inflow Conc	ppb	199.4	117.6	199.4	126.6	199.4	105.8							199.4
Treated Outflow Volume	hm3/yr	65.4	65.4	65.4	65.4	59.2	53.7							184.6
Treated Outflow Load	kg/yr	7696	1364	8283	1437	6259	1275							4075
Treated FWM Outflow Conc	ppb	117.6	20.8	126.6	22.0	105.8	23.8							22.1
Upper Confidence Limit	ppb	129.8	27.4	140.5	29.6	122.0	32.1							29.6
Lower Confidence Limit	ppb	103.9	15.9	110.9	16.5	88.5	17.8							16.7
Total Outflow Volume + Bypass	hm3/yr	65.4	65.4	65.4	65.4	59.2	53.7							184.6
Total Outflow Load + Bypass	kg/yr	7696	1364	8283	1437	6259	1275							4075.4
Total FWM Outflow Conc	ppb	117.6	20.8	126.6	22.0	105.8	23.8							22.1
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	1.11	1.03	1.11	1.03	1.11	0.99							3.32
Maximum Outflow	hm3/d	1.03	1.00	1.03	1.01	0.99	0.95							2.96
Surface Load Reduction	kg/yr	5351	6332	4765	6847	6789	4984							35067
Load Trapped in Sediments	kg/yr	4524	6286	4860	6986	6096	4892							33644
Overall Load Reduction	%	41%	82%	37%	83%	52%	80%							90%
Lower Confidence Limit	%	35%	79%	30%	79%	45%	76%							86%
Upper Confidence Limit	%	48%	85%	44%	85%	60%	82%							92%
Daily Geometric Mean	ppb	103.7	14.2	112.0	14.8	102.9	16.4							#N/A
Outflow Geo Mean - Composites	ppb	103.4	15.7	111.7	16.4	93.9	17.5							16.2
Upper Confidence Limit	ppb	114.5	22.00	124.7	23.7	109.3	25.3							23.2
Lower Confidence Limit	ppb	90.6	11.07	96.9	11.3	77.5	12.1							11.2
Frequency Outflow Conc > 10 ppb	%	100%	90%	100%	91%	100%	93%							90%
Frequency Outflow Conc > 20 ppb	%	100%	25%	100%	30%	100%	37%							60%
Frequency Outflow Conc > 50 ppb	%	100%	0%	100%	0%	100%	0%							29%
Freq Outflow Volume > 10 ppb	%	100%	96%	100%	96%	100%	98%							97%
95th Percentile Outflow Conc	ppb	156	29	169	31	140	34							30
Mean Biomass P Storage	mg/m2	4203	1275	4515	1417	4152	1321							2677
Storage Increase / Net Removal	%	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							5.5
Unit Area P Removal	g/m2-yr	1339	1273	1438	1415	1322	1319							1348
Mean Water Load	cm/d	5.3	3.6	5.3	3.6	3.9	4.4							2.2
Max Water Load	cm/d	32.7	20.9	32.7	20.9	24.0	26.6							13.3
Mean Depth	cm	53	63	53	63	50	54							56
Minimum Depth	cm	24	44	24	44	10	8							27
Maximum Depth	cm	90	89	90	90	89	88							89
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.2%	0.7%							0.1%
Flow/Width	m2/day	115	115	115	115	115	104							113.2
HRT Days	days	9.9	17.3	9.9	17.3	12.8	12.4							26.2
Mean Velocity	cm/sec	0.25	0.21	0.25	0.21	0.27	0.22							0.23
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	10%	9%							6%
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	0.67	0.65	0.67	0.65	0.62	0.59							1.9
95th Percentile Outflow Load	kg/d	91.25	16.91	96.31	17.77	74.04	17.33							51.7
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	-	-	-	-	-	-	0.87							1
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-							0
Range Check - Flow/Width	-	-	0.71	-	0.71	-	0.64							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	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.00%
Warning or Error Messages		Cell# 2 1B Flow/Width out of calib. range for SAV_3: 115 vs. 162 - 374 m2/day												4
		Cell# 4 2B Flow/Width out of calib. range for SAV_3: 115 vs. 162 - 374 m2/day												
		Cell# 6 3B Depth out of calib. range for SAV_3: 54 vs. 62 - 87 cm												
		Cell# 6 3B Flow/Width out of calib. range for SAV_3: 104 vs. 162 - 374 m2/day												

Table A.17 STA-5: Case "2006 Base Emg"

DMSTA2- Inputs & Outputs Project: PROJECT_STA5 Model Release: 7/1/2005
Current Date: 09/02/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2006 Base Em	STA-5 expanded to include Flow-Way 3; no bypass to STA-6 (max. daily inflow 1,575 cfs during period WY 1995-2005)
Input Series Name		TS_Base	2006-2009; downstream cells considered as SAV_3
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	Flow-Way 3 generally based on April 2005 Draft BODR; bypass directed to STA-6
Starting Date for Output	-	05/01/94	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	Output Variable / Mean / Lower CL / Upper CL
Output Averaging Interval	days	7	FWM Outflow C (ppb) 57.2 74.3 41.9
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 50.5 66.7 35.9
Rainfall P Conc	ppb	10	Load Reduction % 73% 65% 80%
Atmospheric P Load (Dry)	mg/m2-yr	20	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	0	

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	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3						
Inflow Fraction	-	0.33333		0.33334		0.33333							
Downstream Cell Number	-	2		4		6							
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71						
Mean Width of Flow Path	km	1.56	1.56	1.56	1.56	1.56	1.56						
Number of Tanks in Series	-	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						
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	0.0075	0.0075			0.0075	0.0075						
Outflow Seepage Control Elev	cm	-46	-38										
Max Outflow Seepage Conc	ppb	20	20			20	20						
Seepage Recycle to Cell Number	-	1	2			5	6						
Seepage Recycle Fraction	-	1	1										
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	16.8	16.8	16.8	16.8	16.8						
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	9.18	9.73	10.27	10.91	11.45	12.09							12.09
Run Date	-	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05							09/02/05
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
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
Ending Date	-	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
Cell Label		1A	1B	2A	2B	3A	3B							Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow							-
Network Simulation Name	-	none	none	none	none	none	none							none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta							Uncerta
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71							24.95
Mean Rainfall	cm/yr	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
Cell Inflow Volume	hm3/yr	65.4	65.4	65.4	65.4	65.4	59.2							196.3
Cell Inflow Load	kg/yr	13047	7696	13048	8283	13047	6259							39143
Cell Inflow Conc	ppb	199.4	117.6	199.4	126.6	199.4	105.8							199.4
Treated Outflow Volume	hm3/yr	65.4	65.4	65.4	65.4	59.2	53.7							184.6
Treated Outflow Load	kg/yr	7696	3496	8283	4006	6259	3061							10563
Treated FWM Outflow Conc	ppb	117.6	53.4	126.6	61.2	105.8	57.0							57.2
Upper Confidence Limit	ppb	129.8	67.9	140.5	79.9	122.0	75.4							74.3
Lower Confidence Limit	ppb	103.9	40.1	110.9	44.4	88.5	41.0							41.9
Total Outflow Volume + Bypass	hm3/yr	65.4	65.4	65.4	65.4	59.2	53.7							184.6
Total Outflow Load + Bypass	kg/yr	7696	3496	8283	4006	6259	3061							10563.2
Total FWM Outflow Conc	ppb	117.6	53.4	126.6	61.2	105.8	57.0							57.2
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	1.11	1.03	1.11	1.03	1.11	0.99							3.32
Maximum Outflow	hm3/d	1.03	1.00	1.03	1.01	0.99	0.95							2.96
Surface Load Reduction	kg/yr	5351	4200	4765	4277	6789	3197							28580
Load Trapped in Sediments	kg/yr	4524	3795	4860	4416	6096	2933							26623
Overall Load Reduction	%	41%	55%	37%	52%	52%	51%							73%
Lower Confidence Limit	%	35%	48%	30%	43%	45%	44%							65%
Upper Confidence Limit	%	48%	61%	44%	60%	60%	58%							80%
Daily Geometric Mean	ppb	103.7	45.3	112.0	52.2	102.9	52.4							#N/A
Outflow Geo Mean - Composites	ppb	103.4	47.3	111.7	54.6	93.9	49.8							50.5
Upper Confidence Limit	ppb	114.5	61.09	124.7	72.6	109.3	67.3							66.7
Lower Confidence Limit	ppb	90.6	34.48	96.9	38.3	77.5	34.5							35.9
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%	100%	100%							100%
Frequency Outflow Conc > 20 ppb	%	100%	100%	100%	100%	100%	100%							100%
Frequency Outflow Conc > 50 ppb	%	100%	44%	100%	62%	100%	54%							100%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	100%	100%							100%
95th Percentile Outflow Conc	ppb	156	66	169	76	140	71							71
Mean Biomass P Storage	mg/m2	4203	2413	4515	2808	4152	2482							3350
Storage Increase / Net Removal	%	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
Unit Area P Removal	g/m2-yr	1339	769	1438	895	1322	790							1067
Mean Water Load	cm/d	5.3	3.6	5.3	3.6	3.9	4.4							2.2
Max Water Load	cm/d	32.7	20.9	32.7	20.9	24.0	26.6							13.3
Mean Depth	cm	53	63	53	63	50	54							56
Minimum Depth	cm	24	44	24	44	10	8							27
Maximum Depth	cm	90	89	90	90	89	88							89
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.2%	0.7%							0.1%
Flow/Width	m2/day	115	115	115	115	115	104							113.2
HRT Days	days	9.9	17.3	9.9	17.3	12.8	12.4							26.2
Mean Velocity	cm/sec	0.25	0.21	0.25	0.21	0.27	0.22							0.23
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	10%	9%							6%
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	0.67	0.65	0.67	0.65	0.62	0.59							1.9
95th Percentile Outflow Load	kg/d	91.25	39.43	96.31	43.63	74.04	37.17							119.5
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	-	-	-	-	-	-	-							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%
Mass Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.00%
Warning or Error Messages														0

Table A.18 STA-6: Case "SEC1_SDR"

DMSTA2- Inputs & Outputs Project: PROJECT_STA6 Model Release: 7/1/2005
Current Date: 08/04/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	SECT1_SDR	STA-6 Section 1 Only
Input Series Name	-	TS_SDRUnit2	Inflows limited to historic inflows from USSC SDR Unit 2; analysis limited to WY 2001-2004
Starting Date for Simulation	-	05/01/00	Flows in data file increased by 1.25 (flows were reduced by 20% from historic)
Ending Date for Simulation	-	04/30/04	Target Seepage Outflow from Cell 3 = 1,500 ac-ft/yr (no return); 5,000 ac-ft/yr from Cell 5 (no return)
Starting Date for Output	-	05/01/00	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	Output Variable / Mean / Lower CL / Upper CL
Output Averaging Interval	days	7	FWM Outflow C (ppb) 27.7 34.0 22.1
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 22.7 28.4 17.5
Rainfall P Conc	ppb	10	Load Reduction % 70% 63% 76%
Atmospheric P Load (Dry)	mg/m2-yr	20	Bypass Load (%) 0.0%

Diagnostics

H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	-0.2%	0.2%
Iterations & Convergence	3	0.2%
Warning/Error Messages	0	

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	-	0.34125	0.90875										
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	0.007	0.007										
Outflow Seepage Control Elev	cm	-30	-40										
Max Outflow Seepage Conc	ppb	20	20										
Seepage Recycle to Cell Number	-	1	2										
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	8.25	9.25											9.25
Run Date	-	08/04/05	08/04/05											08/04/05
Starting Date for Simulation	-	05/01/00	05/01/00											05/01/00
Starting Date for Output	-	05/01/00	05/01/00											05/01/00
Ending Date	-	04/30/04	04/30/04											04/30/04
Output Duration	days	1461	1461											1461
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	27.8	27.8											27.8
Mean ET	cm/yr	21.4	20.7											20.9
Cell Inflow Volume	hm3/yr	17.0	45.3											62.3
Cell Inflow Load	kg/yr	1382	3679											5061
Cell Inflow Conc	ppb	81.3	81.3											81.3
Treated Outflow Volume	hm3/yr	15.1	39.6											54.7
Treated Outflow Load	kg/yr	421	1095											1516
Treated FWM Outflow Conc	ppb	27.8	27.6											27.7
Upper Confidence Limit	ppb	34.2	33.9											34.0
Lower Confidence Limit	ppb	22.1	22.1											22.1
Total Outflow Volume + Bypass	hm3/yr	15.1	39.6											54.7
Total Outflow Load + Bypass	kg/yr	421	1095											1515.7
Total FWM Outflow Conc	ppb	27.8	27.6											27.7
Bypass Load	kg/yr	0	0											0.0
Bypass Load	%	0.0	0.0											0.0
Maximum Inflow	hm3/d	0.23	0.62											0.86
Maximum Outflow	hm3/d	0.23	0.62											0.86
Surface Load Reduction	kg/yr	960	2585											3545
Load Trapped in Sediments	kg/yr	896	2359											3255
Overall Load Reduction	%	70%	70%											70%
Lower Confidence Limit	%	63%	64%											63%
Upper Confidence Limit	%	76%	76%											76%
Daily Geometric Mean	ppb	24.4	24.4											#N/A
Outflow Geo Mean - Composites	ppb	22.9	22.6											22.7
Upper Confidence Limit	ppb	28.7	28.26											28.4
Lower Confidence Limit	ppb	17.6	17.42											17.5
Frequency Outflow Conc > 10 ppb	%	100%	100%											100%
Frequency Outflow Conc > 20 ppb	%	81%	76%											100%
Frequency Outflow Conc > 50 ppb	%	1%	1%											78%
Freq Outflow Volume > 10 ppb	%	100%	100%											100%
95th Percentile Outflow Conc	ppb	30	29											30
Mean Biomass P Storage	mg/m2	1362	1346											1350
Storage Increase / Net Removal	%	0%	0%											0%
Net Storage Turnover Rate	1/yr	2.7	2.7											2.7
Unit Area P Removal	g/m2-yr	904	894											897
Mean Water Load	cm/d	4.7	4.7											4.7
Max Water Load	cm/d	23.6	23.6											23.6
Mean Depth	cm	46	47											47
Minimum Depth	cm	1	1											1
Maximum Depth	cm	79	83											82
Frequency Depth < 10 cm	%	2.4%	2.9%											2.7%
Flow/Width	m2/day	76	95											89.6
HRT Days	days	9.8	10.1											10.0
Mean Velocity	cm/sec	0.19	0.23											0.22
Seepage Outflow / Total Outflow	%	11%	13%											12%
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	0.12	0.31											0.4
95th Percentile Outflow Load	kg/d	3.44	8.86											12.3
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
Range Check - Inflow Conc	-	-	-											0
Range Check - Outflow Conc	-	-	-											0
Water Balance Error	%	0.00%	0.00%											0.00%
Mass Balance Error	%	-0.17%	-0.17%											-0.17%
Warning or Error Messages														0

Table A.19 STA-6: Case "HIST_SAV"

DMSTA2- Inputs & Outputs Project: PROJECT_STA6 Model Release: 7/1/2005 Current Date: 08/04/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	HIST_SAV	STA-6 Section 1 Only, vegetation considered as SAV in lieu of PEW
Input Series Name	-	TS_SDRUnit2	Inflows limited to historic inflows from USSC SDR Unit 2; analysis limited to WY 2001-2004
Starting Date for Simulation	-	05/01/00	Flows in data file increased by 1.25 (flows were reduced by 20% from historic)
Ending Date for Simulation	-	04/30/04	Target Seepage Outflow from Cell 3 = 1,500 ac-ft/yr (no return); 5,000 ac-ft per year from Cell 5 (no return)
Starting Date for Output	-	05/01/00	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	Output Variable / Mean / Lower CL / Upper CL
Output Averaging Interval	days	7	FWM Outflow C (ppb) 19.5 23.3 16.4
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 15.1 18.6 12.1
Rainfall P Conc	ppb	10	Load Reduction % 79% 75% 82%
Atmospheric P Load (Dry)	mg/m2-yr	20	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	2	1.0%
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	-	0.34125	0.90875										
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	0.007	0.007										
Outflow Seepage Control Elev	cm	-30	-40										
Max Outflow Seepage Conc	ppb	20	20										
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	6.50	7.25											7.25
Run Date	-	08/04/05	08/04/05											08/04/05
Starting Date for Simulation	-	05/01/00	05/01/00											05/01/00
Starting Date for Output	-	05/01/00	05/01/00											05/01/00
Ending Date	-	04/30/04	04/30/04											04/30/04
Output Duration	days	1461	1461											1461
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	27.8	27.8											27.8
Mean ET	cm/yr	21.4	20.7											20.9
Cell Inflow Volume	hm3/yr	17.0	45.3											62.3
Cell Inflow Load	kg/yr	1382	3679											5061
Cell Inflow Conc	ppb	81.3	81.3											81.3
Treated Outflow Volume	hm3/yr	15.1	39.6											54.7
Treated Outflow Load	kg/yr	297	773											1070
Treated FWM Outflow Conc	ppb	19.6	19.5											19.5
Upper Confidence Limit	ppb	23.4	23.3											23.3
Lower Confidence Limit	ppb	16.4	16.4											16.4
Total Outflow Volume + Bypass	hm3/yr	15.1	39.6											54.7
Total Outflow Load + Bypass	kg/yr	297	773											1069.5
Total FWM Outflow Conc	ppb	19.6	19.5											19.5
Bypass Load	kg/yr	0	0											0.0
Bypass Load	%	0.0	0.0											0.0
Maximum Inflow	hm3/d	0.23	0.62											0.86
Maximum Outflow	hm3/d	0.23	0.62											0.86
Surface Load Reduction	kg/yr	1085	2906											3991
Load Trapped in Sediments	kg/yr	1043	2756											3799
Overall Load Reduction	%	79%	79%											79%
Lower Confidence Limit	%	74%	75%											75%
Upper Confidence Limit	%	82%	82%											82%
Daily Geometric Mean	ppb	15.6	15.7											#N/A
Outflow Geo Mean - Composites	ppb	15.2	15.1											15.1
Upper Confidence Limit	ppb	18.8	18.55											18.6
Lower Confidence Limit	ppb	12.2	12.10											12.1
Frequency Outflow Conc > 10 ppb	%	98%	98%											98%
Frequency Outflow Conc > 20 ppb	%	9%	9%											45%
Frequency Outflow Conc > 50 ppb	%	1%	1%											9%
Freq Outflow Volume > 10 ppb	%	100%	100%											100%
95th Percentile Outflow Conc	ppb	22	22											22
Mean Biomass P Storage	mg/m2	1054	1046											1048
Storage Increase / Net Removal	%	0%	0%											0%
Net Storage Turnover Rate	1/yr	4.0	4.0											4.0
Unit Area P Removal	g/m2-yr	1053	1044											1047
Mean Water Load	cm/d	4.7	4.7											4.7
Max Water Load	cm/d	23.6	23.6											23.6
Mean Depth	cm	46	47											47
Minimum Depth	cm	1	1											1
Maximum Depth	cm	79	83											82
Frequency Depth < 10 cm	%	2.4%	2.9%											2.7%
Flow/Width	m2/day	76	95											89.6
HRT Days	days	9.8	10.1											10.0
Mean Velocity	cm/sec	0.19	0.23											0.22
Seepage Outflow / Total Outflow	%	11%	13%											12%
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	0.12	0.31											0.4
95th Percentile Outflow Load	kg/d	2.50	6.42											8.9
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	-	0.74	0.76											2
Range Check - Freq Depth < 10 cm	-	-	-											0
Range Check - Flow/Width	-	0.47	0.58											2
Range Check - Inflow Conc	-	-	-											0
Range Check - Outflow Conc	-	-	-											0
Water Balance Error	%	0.00%	0.00%											0.00%
Mass Balance Error	%	-0.11%	-0.11%											-0.11%
Warning or Error Messages		Cell# 1 3 Depth out of calib. range for SAV_3: 46 vs. 62 - 87 cm Cell# 1 3 Flow/Width out of calib. range for SAV_3: 76 vs. 162 - 374 m2/day Cell# 2 5 Depth out of calib. range for SAV_3: 47 vs. 62 - 87 cm Cell# 2 5 Flow/Width out of calib. range for SAV_3: 95 vs. 162 - 374 m2/day												4

Table A.20 STA-6: Case "2006 Base"

DMSTA2- Inputs & Outputs Project: PROJECT_STA6 Model Release: 7/1/2005
Current Date: 08/04/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2006_Base	STA-6 Section 1 and Section 2
Input Series Name		TS_Base	Inflows limited to USSO historic and 80% of USSC SDR Unit 2 historic
Starting Date for Simulation	-	05/01/97	Section 2 geometrics from May 2005 BODR for STA-6 by URS
Ending Date for Simulation	-	04/30/05	Net Area of Cell 2 = approx. 1,300 ac.
Starting Date for Output	-	05/01/97	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	Output Variable / Mean / Lower CL / Upper CL
Output Averaging Interval	days	7	FWM Outflow C (ppb) 14.3 17.6 11.8
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 10.3 13.7 7.7
Rainfall P Conc	ppb	10	Load Reduction % 85% 82% 88%
Atmospheric P Load (Dry)	mg/m2-yr	20	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	5	

Cell Number -->		1	2	3	4	5	6	7	8	9	10	11	12
Cell Label	-	3	5	2									
Vegetation Type	-->	PEW_3	PEW_3	SAV_3									
Inflow Fraction	-	0.08	0.22	0.7									
Downstream Cell Number	-												
Surface Area	km2	0.99	2.64	5.26									
Mean Width of Flow Path	km	0.61	1.31	2.39									
Number of Tanks in Series	-	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	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												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm			0.005									
Outflow Seepage Control Elev	cm	-30	-40	-46									
Max Outflow Seepage Conc	ppb	20	20	20									
Seepage Recycle to Cell Number	-	1	2	3									
Seepage Recycle Fraction	-	1	1										
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30									
Initial P Storage Per Unit Area	mg/m2	500	500	500									
Initial Water Column Depth	cm	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	34.9	34.9	52.5	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	6.50	7.25	8.00										8.00
Run Date	-	08/04/05	08/04/05	08/04/05										08/04/05
Starting Date for Simulation	-	05/01/97	05/01/97	05/01/97										05/01/97
Starting Date for Output	-	05/01/97	05/01/97	05/01/97										05/01/97
Ending Date	-	04/30/05	04/30/05	04/30/05										04/30/05
Output Duration	days	2922	2922	2922										2922
Cell Label		3	5	2										Total
Downstream Cell Label		Outflow	Outflow	Outflow										-
Network Simulation Name	-	none	none	none										none
Simulation Type	-	Uncerta	Uncerta	Uncerta										Uncerta
Surface Area	km2	0.99	2.64	5.26										8.89
Mean Rainfall	cm/yr	41.9	41.9	41.9										41.9
Mean ET	cm/yr	38.1	38.1	38.1										38.1
Cell Inflow Volume	hm3/yr	7.8	21.3	67.9										97.0
Cell Inflow Load	kg/yr	664	1825	5807										8296
Cell Inflow Conc	ppb	85.5	85.5	85.5										85.5
Treated Outflow Volume	hm3/yr	7.8	21.4	57.9										87.2
Treated Outflow Load	kg/yr	104	293	851										1247
Treated FWM Outflow Conc	ppb	13.3	13.7	14.7										14.3
Upper Confidence Limit	ppb	17.2	17.7	17.6										17.6
Lower Confidence Limit	ppb	10.5	10.8	12.4										11.8
Total Outflow Volume + Bypass	hm3/yr	7.8	21.4	57.9										87.2
Total Outflow Load + Bypass	kg/yr	104	293	851										1247.3
Total FWM Outflow Conc	ppb	13.3	13.7	14.7										14.3
Bypass Load	kg/yr	0	0	0										0.0
Bypass Load	%	0.0	0.0	0.0										0.0
Maximum Inflow	hm3/d	0.13	0.35	1.12										1.60
Maximum Outflow	hm3/d	0.11	0.29	0.99										1.39
Surface Load Reduction	kg/yr	560	1532	4957										7049
Load Trapped in Sediments	kg/yr	584	1596	4852										7032
Overall Load Reduction	%	84%	84%	85%										85%
Lower Confidence Limit	%	80%	79%	82%										82%
Upper Confidence Limit	%	88%	87%	88%										88%
Daily Geometric Mean	ppb	9.8	10.1	9.8										#N/A
Outflow Geo Mean - Composites	ppb	10.0	10.3	11.0										10.3
Upper Confidence Limit	ppb	13.8	14.24	13.9										13.7
Lower Confidence Limit	ppb	7.2	7.45	8.7										7.7
Frequency Outflow Conc > 10 ppb	%	43%	53%	62%										51%
Frequency Outflow Conc > 20 ppb	%	2%	2%	4%										9%
Frequency Outflow Conc > 50 ppb	%	0%	0%	0%										3%
Freq Outflow Volume > 10 ppb	%	74%	81%	83%										81%
95th Percentile Outflow Conc	ppb	17	17	19										18
Mean Biomass P Storage	mg/m2	888	911	924										916
Storage Increase / Net Removal	%	0%	0%	0%										0%
Net Storage Turnover Rate	1/yr	5.3	5.3	8.0										6.9
Unit Area P Removal	g/m2-yr	589	605	922										791
Mean Water Load	cm/d	2.1	2.2	3.5										3.0
Max Water Load	cm/d	12.9	13.4	21.3										18.0
Mean Depth	cm	44	46	60										54
Minimum Depth	cm	37	37	42										40
Maximum Depth	cm	64	68	80										75
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%										0.0%
Flow/Width	m2/day	35	45	78										63.1
HRT Days	days	20.6	20.7	16.9										18.0
Mean Velocity	cm/sec	0.09	0.11	0.15										0.13
Seepage Outflow / Total Outflow	%	0%	0%	15%										10%
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	0.06	0.17	0.52										0.7
95th Percentile Outflow Load	kg/d	1.05	2.91	9.37										13.5
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	-	-	-	0.96										1
Range Check - Freq Depth < 10 cm	-	-	-	-										0
Range Check - Flow/Width	-	0.51	0.65	0.48										3
Range Check - Inflow Conc	-	-	-	-										0
Range Check - Outflow Conc	-	-	-	0.99										1
Water Balance Error	%	0.00%	0.00%	0.00%										0.00%
Mass Balance Error	%	0.00%	0.00%	0.00%										0.00%
Warning or Error Messages		Cell# 1 3 Flow/Width out of calib. range for PEW_3: 35 vs. 69 - 276 m2/day												5
		Cell# 2 5 Flow/Width out of calib. range for PEW_3: 45 vs. 69 - 276 m2/day												
		Cell# 3 2 Depth out of calib. range for SAV_3: 60 vs. 62 - 87 cm												
		Cell# 3 2 Flow/Width out of calib. range for SAV_3: 78 vs. 162 - 374 m2/day												
		Cell# 3 2 Outflow Conc out of calib. range for SAV_3: 15 vs. 15 - 153 ppb												

Table A.21 STA-6: Case "Sect1_USSO"

DMSTA2- Inputs & Outputs Project: PROJECT_STA6 Model Release: 7/1/2005
Current Date: 08/04/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	Sect1_USSO	STA-6 Section 1 Only
Input Series Name		TS_USSO	Inflows limited to historic discharges from C-139 Annex (USSO)
Starting Date for Simulation	-	05/01/96	Used seepage losses as from existing (Sect1_SDR)
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	7	
Inflow Conc Scale Factor	-	1	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Simulation Type:	Uncertainty Analysis		
Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	25.1	32.0	19.4
GM Outflow C (ppb)	21.2	28.0	15.5
Load Reduction %	78%	72%	83%
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	0.007	0.007										
Outflow Seepage Control Elev	cm	-30	-40										
Max Outflow Seepage Conc	ppb	20	20										
Seepage Recycle to Cell Number	-	1	2										
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	4.78	5.33											5.33
Run Date	-	08/04/05	08/04/05											08/04/05
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	11.7	30.4											42.0
Treated Outflow Load	kg/yr	294	760											1054
Treated FWM Outflow Conc	ppb	25.2	25.0											25.1
Upper Confidence Limit	ppb	32.2	31.9											32.0
Lower Confidence Limit	ppb	19.4	19.4											19.4
Total Outflow Volume + Bypass	hm3/yr	11.7	30.4											42.0
Total Outflow Load + Bypass	kg/yr	294	760											1053.6
Total FWM Outflow Conc	ppb	25.2	25.0											25.1
Bypass Load	kg/yr	0	0											0.0
Bypass Load	%	0.0	0.0											0.0
Maximum Inflow	hm3/d	0.21	0.56											0.77
Maximum Outflow	hm3/d	0.21	0.56											0.77
Surface Load Reduction	kg/yr	1038	2785											3823
Load Trapped in Sediments	kg/yr	989	2601											3589
Overall Load Reduction	%	78%	79%											78%
Lower Confidence Limit	%	72%	73%											72%
Upper Confidence Limit	%	83%	83%											83%
Daily Geometric Mean	ppb	21.7	22.8											#N/A
Outflow Geo Mean - Composites	ppb	21.3	21.2											21.2
Upper Confidence Limit	ppb	28.2	28.00											28.0
Lower Confidence Limit	ppb	15.6	15.57											15.5
Frequency Outflow Conc > 10 ppb	%	100%	100%											100%
Frequency Outflow Conc > 20 ppb	%	60%	58%											99%
Frequency Outflow Conc > 50 ppb	%	0%	0%											57%
Freq Outflow Volume > 10 ppb	%	100%	100%											100%
95th Percentile Outflow Conc	ppb	31	30											30
Mean Biomass P Storage	mg/m2	1503	1485											1490
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	998	985											989
Mean Water Load	cm/d	3.7	3.7											3.7
Max Water Load	cm/d	21.3	21.3											21.3
Mean Depth	cm	45	46											45
Minimum Depth	cm	6	3											4
Maximum Depth	cm	76	80											79
Frequency Depth < 10 cm	%	0.6%	2.8%											2.2%
Flow/Width	m2/day	61	75											71.4
HRT Days	days	12.0	12.2											12.1
Mean Velocity	cm/sec	0.16	0.19											0.18
Seepage Outflow / Total Outflow	%	14%	16%											15%
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	3.02	7.96											11.0
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.22 STA-6: Case "Sect1_USSO_SAV"

DMSTA2- Inputs & Outputs Project: PROJECT_STA6 Model Release: 7/1/2005
Current Date: 08/04/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	ect1_USSO_SA	STA-6 Section 1 Only
Input Series Name		TS_USSO	Inflows limited to historic discharges from C-139 Annex (USSO)
Starting Date for Simulation	-	05/01/96	Used seepage losses as from existing (Sect1_SDR)
Ending Date for Simulation	-	04/30/05	Vegetation considered as SAV in lieu of PEW
Starting Date for Output	-	05/01/96	
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis
Number of Iterations	-	0	Output Variable / Mean / Lower CL / Upper CL
Output Averaging Interval	days	7	FWM Outflow C (ppb) 17.0 20.6 14.1
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 13.1 16.7 10.3
Rainfall P Conc	ppb	10	Load Reduction % 85% 82% 88%
Atmospheric P Load (Dry)	mg/m2-yr	20	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	0.007	0.007										
Outflow Seepage Control Elev	cm	-30	-40										
Max Outflow Seepage Conc	ppb	20	20										
Seepage Recycle to Cell Number	-	1	2										
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	4.78	5.33											5.33
Run Date	-	08/04/05	08/04/05											08/04/05
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	11.7	30.4											42.0
Treated Outflow Load	kg/yr	199	515											714
Treated FWM Outflow Conc	ppb	17.0	17.0											17.0
Upper Confidence Limit	ppb	20.6	20.6											20.6
Lower Confidence Limit	ppb	14.2	14.1											14.1
Total Outflow Volume + Bypass	hm3/yr	11.7	30.4											42.0
Total Outflow Load + Bypass	kg/yr	199	515											713.8
Total FWM Outflow Conc	ppb	17.0	17.0											17.0
Bypass Load	kg/yr	0	0											0.0
Bypass Load	%	0.0	0.0											0.0
Maximum Inflow	hm3/d	0.21	0.56											0.77
Maximum Outflow	hm3/d	0.21	0.56											0.77
Surface Load Reduction	kg/yr	1133	3030											4163
Load Trapped in Sediments	kg/yr	1103	2915											4018
Overall Load Reduction	%	85%	85%											85%
Lower Confidence Limit	%	82%	82%											82%
Upper Confidence Limit	%	88%	88%											88%
Daily Geometric Mean	ppb	13.0	13.6											#N/A
Outflow Geo Mean - Composites	ppb	13.2	13.2											13.1
Upper Confidence Limit	ppb	16.8	16.76											16.7
Lower Confidence Limit	ppb	10.3	10.33											10.3
Frequency Outflow Conc > 10 ppb	%	87%	87%											86%
Frequency Outflow Conc > 20 ppb	%	7%	7%											25%
Frequency Outflow Conc > 50 ppb	%	0%	0%											7%
Freq Outflow Volume > 10 ppb	%	97%	97%											97%
95th Percentile Outflow Conc	ppb	22	22											22
Mean Biomass P Storage	mg/m2	1115	1106											1109
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	1113	1105											1107
Mean Water Load	cm/d	3.7	3.7											3.7
Max Water Load	cm/d	21.3	21.3											21.3
Mean Depth	cm	45	46											45
Minimum Depth	cm	6	3											4
Maximum Depth	cm	76	80											79
Frequency Depth < 10 cm	%	0.6%	2.8%											2.2%
Flow/Width	m2/day	61	75											71.4
HRT Days	days	12.0	12.2											12.1
Mean Velocity	cm/sec	0.16	0.19											0.18
Seepage Outflow / Total Outflow	%	14%	16%											15%
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	2.14	5.65											7.8
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	-	0.72	0.74											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		Cell# 1 3 Depth out of calib. range for SAV_3: 45 vs. 62 - 87 cm												4
		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: 46 vs. 62 - 87 cm												
		Cell# 2 5 Flow/Width out of calib. range for SAV_3: 75 vs. 162 - 374 m2/day												

Table A.23 STA-3/4: Case "2006 WS"

DMSTA2- Inputs & Outputs Project: PROJECT_STA34 Model Release: 7/1/2005 Current Date: 09/02/05

Input Variable	Units	Value	Case Description:
Design Case Name	-	2006 WS	STA-3/4, all cells
Input Series Name		TS_2006_WS	All inflows
Starting Date for Simulation	-	05/01/65	Lake water supply releases to low WCA and to Big Cypress Reservation included in treatment area inflows.
Ending Date for Simulation	-	04/30/00	
Starting Date for Output	-	05/01/65	
Integration Steps Per Day	-	4	Simulation Type: Base
Number of Iterations	-	0	Output Variable / Mean / Lower CL / Upper CL
Output Averaging Interval	days	7	FWM Outflow C (ppb) 20.3 #N/A #N/A
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb) 15.7 #N/A #N/A
Rainfall P Conc	ppb	10	Load Reduction % 76% #N/A #N/A
Atmospheric P Load (Dry)	mg/m2-yr	20	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	PEW_3	EMG_3	SAV_3	EMG_3	SAV_3						
Inflow Fraction	-	0.34		0.36		0.3							
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	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	7.83	8.26	9.00	9.43	9.97	10.51							10.51
Run Date	-	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05							09/02/05
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	-	none	none	none	none	none	none							none
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	290.7	285.1	307.8	312.2	256.5	239.2							855.1
Cell Inflow Load	kg/yr	23704	14349	25099	17201	20916	12928							69719
Cell Inflow Conc	ppb	81.5	50.3	81.5	55.1	81.5	54.1							81.5
Treated Outflow Volume	hm3/yr	285.1	280.7	312.2	311.6	239.2	238.7							831.0
Treated Outflow Load	kg/yr	14349	5781	17201	6290	12928	4806							16877
Treated FWM Outflow Conc	ppb	50.3	20.6	55.1	20.2	54.1	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	285.1	280.7	312.2	311.6	239.2	238.7							831.0
Total Outflow Load + Bypass	kg/yr	14349	5781	17201	6290	12928	4806							16877.3
Total FWM Outflow Conc	ppb	50.3	20.6	55.1	20.2	54.1	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	4.34	4.14	4.60	4.38	3.83	3.63							12.77
Maximum Outflow	hm3/d	4.14	4.29	4.38	4.58	3.63	3.77							12.64
Surface Load Reduction	kg/yr	9355	8568	7898	10912	7987	8122							52842
Load Trapped in Sediments	kg/yr	9126	8938	8018	11295	7305	8409							53091
Overall Load Reduction	%	39%	60%	31%	63%	38%	63%							76%
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	44.5	15.3	49.5	14.6	47.5	13.4							#N/A
Outflow Geo Mean - Composites	ppb	45.3	17.0	50.3	15.7	50.1	15.9							15.7
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%	98%	100%	91%	100%	92%							91%
Frequency Outflow Conc > 20 ppb	%	100%	29%	100%	25%	100%	28%							55%
Frequency Outflow Conc > 50 ppb	%	22%	0%	49%	0%	49%	0%							24%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	98%	100%	97%							99%
95th Percentile Outflow Conc	ppb	56	26	61	26	61	26							26
Mean Biomass P Storage	mg/m2	2330	954	2446	966	2387	944							1643
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%							0%
Net Storage Turnover Rate	1/yr	11.1	23.2	11.1	34.9	11.1	34.9							16.9
Unit Area P Removal	g/m2-yr	742	633	779	965	760	943							793
Mean Water Load	cm/d	6.5	5.5	8.2	7.3	7.3	7.3							3.5
Max Water Load	cm/d	35.3	29.3	44.7	37.4	39.8	40.7							19.1
Mean Depth	cm	69	65	72	68	63	63							67
Minimum Depth	cm	47	32	54	45	22	33							39
Maximum Depth	cm	105	99	111	103	93	94							101
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%							0.0%
Flow/Width	m2/day	233	173	292	213	144	134							199.9
HRT Days	days	10.6	11.8	8.7	9.3	8.6	8.6							19.1
Mean Velocity	cm/sec	0.39	0.31	0.47	0.36	0.27	0.25							0.34
Seepage Outflow / Total Outflow	%	2%	1%	1%	0%	3%	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	2.49	2.51	2.66	2.67	2.17	2.24							7.3
95th Percentile Outflow Load	kg/d	132.64	61.28	155.68	65.85	123.93	52.94							179.5
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	-	1.11	-	1.39	-	-	0.83							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	%	0.08%	0.01%	0.09%	0.02%	0.04%	0.06%							0.09%
Warning or Error Messages														3

Cell# 1 1A Flow/Width out of calib. range for EMG_3: 233 vs. 26 - 210 m2/day
Cell# 3 2A Flow/Width out of calib. range for EMG_3: 292 vs. 26 - 210 m2/day
Cell# 6 3B Flow/Width out of calib. range for SAV_3: 134 vs. 162 - 374 m2/day

Table A.24 STA-1W: Case "2006 WS"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1W Model Release: 7/1/2005 Current Date: 09/02/05

Input Variable	Units	Value
Design Case Name	-	2006_WS
Input Series Name	-	TS_2006_WS
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	7
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
Potential Include all S-5A Basin and EBWCD Runoff from ECP 2006 Simulation to STA-1 I&D Works
Distribution of outflows from STA-1 I&D assigned 70% to STA-1W, 30% to westerly flow path of STA-1E
Added S-352 Water Supply Releases Originally Simulated to Bypass to LNWR

Simulation Type: Base

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	20.5	#N/A	#N/A
GM Outflow C (ppb)	14.0	#N/A	#N/A
Load Reduction %	88%	#N/A	#N/A
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	6.89	7.26	7.63	8.00	8.37	8.74	9.11	9.57					9.57
Run Date	-	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05	09/02/05					09/02/05
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	-	Base	Base	Base	Base	Base	Base	Base	Base					Base
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	129.7	124.8	124.4					128.6
Cell Inflow Volume	hm3/yr	83.8	111.6	113.9	37.5	36.4	35.4	99.2	87.2					220.5
Cell Inflow Load	kg/yr	14494	11599	5450	6484	3994	1295	17164	11219					38143
Cell Inflow Conc	ppb	173.0	103.9	47.9	173.0	109.6	36.6	173.0	128.6					173.0
Treated Outflow Volume	hm3/yr	111.6	113.9	115.5	36.4	35.4	34.4	87.2	72.3					222.1
Treated Outflow Load	kg/yr	11599	5450	2313	3994	1295	682	11219	1567					4562
Treated FWM Outflow Conc	ppb	103.9	47.9	20.0	109.6	36.6	19.9	128.6	21.7					20.5
Upper Confidence Limit	ppb	#N/A	#N/A	#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	#N/A					#N/A
Total Outflow Volume + Bypass	hm3/yr	111.6	113.9	115.5	36.4	35.4	34.4	87.2	72.3					222.1
Total Outflow Load + Bypass	kg/yr	11599	5450	2313	3994	1295	682	11219	1567					4562.2
Total FWM Outflow Conc	ppb	103.9	47.9	20.0	109.6	36.6	19.9	128.6	21.7					20.5
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	2.45	2.60	2.73	1.10	1.10	1.16	2.91	2.82					6.46
Maximum Outflow	hm3/d	2.60	2.73	2.86	1.10	1.16	1.21	2.82	3.06					7.13
Surface Load Reduction	kg/yr	2895	6149	3138	2490	2699	613	5945	9652					33581
Load Trapped in Sediments	kg/yr	3505	6290	3304	2426	2722	646	2784	9196					30873
Overall Load Reduction	%	20%	53%	58%	38%	68%	47%	35%	86%					88%
Lower Confidence Limit	%	#N/A	#N/A	#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	#N/A					#N/A
Daily Geometric Mean	ppb	90.9	39.0	14.2	93.9	22.2	9.2	138.4	11.7					#N/A
Outflow Geo Mean - Composites	ppb	92.4	39.6	14.5	100.8	28.4	12.9	118.2	14.6					14.0
Upper Confidence Limit	ppb	#N/A	#N/A	#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	#N/A					#N/A
Frequency Outflow Conc > 10 ppb	%	100%	100%	86%	100%	100%	71%	100%	84%					84%
Frequency Outflow Conc > 20 ppb	%	100%	100%	16%	100%	88%	14%	100%	18%					39%
Frequency Outflow Conc > 50 ppb	%	100%	17%	0%	100%	3%	0%	100%	0%					12%
Freq Outflow Volume > 10 ppb	%	100%	100%	96%	100%	100%	89%	100%	95%					96%
95th Percentile Outflow Conc	ppb	116	59	25	122	45	26	153	28					24
Mean Biomass P Storage	mg/m2	3650	2090	797	3997	1430	446	3844	993					1836
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	11.1	34.9					21.8
Unit Area P Removal	g/m2-yr	1163	2086	796	1273	1428	446	1224	991					1144
Mean Water Load	cm/d	7.6	10.1	7.5	5.4	5.2	6.7	11.9	2.6					2.2
Max Water Load	cm/d	81.4	86.1	65.8	57.6	58.0	80.3	127.8	30.4					23.9
Mean Depth	cm	67	68	67	57	56	55	50	49					58
Minimum Depth	cm	55	53	43	20	19	1	1	1					22
Maximum Depth	cm	122	124	126	81	86	97	110	106					109
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	8.6%	6.2%					2.9%
Flow/Width	m2/day	209	278	283	43	50	75	153	102					156.4
HRT Days	days	8.8	6.7	8.9	10.6	10.7	8.2	4.2	19.2					25.7
Mean Velocity	cm/sec	0.36	0.47	0.49	0.09	0.10	0.16	0.35	0.24					0.30
Seepage Outflow / Total Outflow	%	0%	0%	2%	3%	3%	3%	1%	4%					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
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	1.04	1.03	1.01	0.43	0.43	0.43	1.07	0.96					2.4
95th Percentile Outflow Load	kg/d	119.53	55.57	24.38	47.80	16.97	9.25	138.20	22.33					55.7
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	-	-	-	-	-	0.90	0.88	-	0.80					3
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-					0
Range Check - Flow/Width	-	-	-	-	-	0.31	0.46	-	0.63					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	%	0.01%	0.01%	0.01%	0.03%	0.04%	0.05%	-0.38%	-0.04%					-0.16%
Warning or Error Messages														6

Cell# 5 2B Depth out of calib. range for SAV_3: 56 vs. 62 - 87 cm
Cell# 5 2B Flow/Width out of calib. range for SAV_3: 50 vs. 162 - 374 m2/day
Cell# 6 4 Depth out of calib. range for SAV_3: 55 vs. 62 - 87 cm
Cell# 6 4 Flow/Width out of calib. range for SAV_3: 75 vs. 162 - 374 m2/day
Cell# 8 5B Depth out of calib. range for SAV_3: 49 vs. 62 - 87 cm
Cell# 8 5B Flow/Width out of calib. range for SAV_3: 102 vs. 162 - 374 m2/day

Table A.25 STA-1E: Case "3_4 2006PSTA"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1E Model Release: 7/1/2005 Current Date: 09/06/05

Input Variable	Units	Value
Design Case Name	-	3_4 2006PSTA
Input Series Name		TS_1_42006A
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	7
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
Cells 3-4S of STA-1E with western half of East Distribution Cell
Inflows from C-51 West adjusted for same-day bypass to S-155A of L-8 runoff through S-5AE, limited to design capacity of S-366
Cell-to-cell seepage not considered in analysis.
Cells 1 and 2 considered off-line due to construction and operation of PSTA Demonstration Project

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	37.1	45.6	29.2
GM Outflow C (ppb)	32.3	40.7	24.6
Load Reduction %	70%	63%	77%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	3.2%	0.0%
Mass Balance Error Mean & Max	0.6%	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	EDCW	3	4N	4S								
Vegetation Type	EMG_3	EMG_3	SAV_3	SAV_3								
Inflow Fraction	1											
Downstream Cell Number	2	3	4									
Surface Area (km2)	0.95	2.38	2.61	3.04								
Mean Width of Flow Path (km)	0.66	1.55	1.55	1.55								
Number of Tanks in Series	0.5	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)	90	40	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)	3.768											
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)	0.0095			0.0054								
Outflow Seepage Control Elev (cm)	-87			-38								
Max Outflow Seepage Conc (ppb)	20			20								
Seepage Recycle to Cell Number	4			7								
Seepage Recycle Fraction	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)	50	50	50	50								
C0 = Conc at 0 g/m2 P Storage (ppb)	3	3	3	3	3	3	3					
C1 = Conc at 1 g/m2 P storage (ppb)	22	22	22	22	22	22	22					
C2 = Conc at Half-Max Uptake (ppb)	300	300	300	300	300	300	300					
K = Net Settling Rate at Steady State (m/yr)	16.8	16.8	52.5	52.5	16.8	52.5	52.5					
Z1 = Saturated Uptake Depth (cm)	40	40	40	40	40	40	40					
Z2 = Lower Penalty Depth (cm)	100	100	100	100	100	100	100					
Z3 = Upper Penalty Depth (cm)	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	3.94	4.40	4.86	5.31									5.31
Run Date	-	09/06/05	09/06/05	09/06/05	09/06/05									09/06/05
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		EDCW	3	4N	4S									Total
Downstream Cell Label		3	4N	4S	Outflow									-
Network Simulation Name	-	none	none	none	none									none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta									Uncerta
Surface Area	km2	0.95	2.38	2.61	3.04									8.98
Mean Rainfall	cm/yr	142.9	142.9	142.9	142.9									142.9
Mean ET	cm/yr	129.7	129.7	129.7	129.7									129.7
Cell Inflow Volume	hm3/yr	199.0	193.0	193.3	193.6									199.0
Cell Inflow Load	kg/yr	24056	22214	19423	12332									24056
Cell Inflow Conc	ppb	120.9	115.1	100.5	63.7									120.9
Treated Outflow Volume	hm3/yr	193.0	193.3	193.6	193.5									193.5
Treated Outflow Load	kg/yr	22214	19423	12332	7181									7181
Treated FWM Outflow Conc	ppb	115.1	100.5	63.7	37.1									37.1
Upper Confidence Limit	ppb	116.4	104.8	71.9	45.6									45.6
Lower Confidence Limit	ppb	113.5	95.2	54.9	29.2									29.2
Total Outflow Volume + Bypass	hm3/yr	193.0	193.3	193.6	193.5									193.5
Total Outflow Load + Bypass	kg/yr	22217	19423	12332	7181									7183.5
Total FWM Outflow Conc	ppb	115.1	100.5	63.7	37.1									37.1
Bypass Load	kg/yr	3	0	0	0									2.9
Bypass Load	%	0.0	0.0	0.0	0.0									0.0
Maximum Inflow	hm3/d	3.44	3.42	3.43	3.42									3.44
Maximum Outflow	hm3/d	3.42	3.43	3.42	3.38									3.38
Surface Load Reduction	kg/yr	1842	2791	7092	5151									16876
Load Trapped in Sediments	kg/yr	1197	2871	7180	5105									16353
Overall Load Reduction	%	8%	13%	37%	42%									70%
Lower Confidence Limit	%	7%	10%	31%	37%									63%
Upper Confidence Limit	%	9%	16%	42%	47%									77%
Daily Geometric Mean	ppb	109.3	95.3	56.9	31.9									#N/A
Outflow Geo Mean - Composites	ppb	109.5	95.4	57.4	32.3									32.3
Upper Confidence Limit	ppb	111.1	100.11	65.9	40.7									40.7
Lower Confidence Limit	ppb	107.5	89.76	48.5	24.6									24.6
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	100%									100%
Frequency Outflow Conc > 20 ppb	%	100%	100%	100%	96%									99%
Frequency Outflow Conc > 50 ppb	%	100%	100%	77%	3%									96%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%									100%
95th Percentile Outflow Conc	ppb	142	111	77	48									48
Mean Biomass P Storage	mg/m2	4073	3790	2758	1684									2807
Storage Increase / Net Removal	%	0%	0%	0%	0%									0%
Net Storage Turnover Rate	1/yr	10.8	11.1	34.9	34.9									22.7
Unit Area P Removal	g/m2-yr	1259	1206	2751	1679									1821
Mean Water Load	cm/d	57.3	22.2	20.3	17.4									6.1
Max Water Load	cm/d	361.3	143.7	131.3	112.4									38.3
Mean Depth	cm	99	70	74	74									75
Minimum Depth	cm	81	34	45	40									44
Maximum Depth	cm	150	122	122	121									125
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%									0.0%
Flow/Width	m2/day	825	341	341	342									392.7
HRT Days	days	1.7	3.2	3.6	4.2									12.4
Mean Velocity	cm/sec	0.97	0.56	0.54	0.54									0.59
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%									0%
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	1.44	1.46	1.48	1.49									1.5
95th Percentile Outflow Load	kg/d	174.23	153.36	104.65	64.62									64.6
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	-	1.29	-	-	-									1
Range Check - Freq Depth < 10 cm	-	-	-	-	-									0
Range Check - Flow/Width	-	3.93	1.62	-	-									2
Range Check - Inflow Conc	-	-	-	-	-									0
Range Check - Outflow Conc	-	-	-	-	-									0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%									3.16%
Mass Balance Error	%	0.00%	0.01%	0.01%	0.01%									0.57%
Warning or Error Messages														4

Cell# 1 EDCW Depth out of calib. range for EMG_3: 99 vs. 35 - 76 cm
Cell# 1 EDCW Flow/Width out of calib. range for EMG_3: 825 vs. 26 - 210 m2/day
Bypass occurred around cell 1
Cell# 2 3 Flow/Width out of calib. range for EMG_3: 341 vs. 26 - 210 m2/day

Table A.26 STA-1E: Case "3_4 PSTADiv"

DMSTA2- Inputs & Outputs Project: PROJECT_STA1E Model Release: 7/1/2005 Current Date: 09/06/05

Input Variable	Units	Value
Design Case Name	-	3_4 PSTA_Div
Input Series Name		TS_1_42006A
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	7
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
Cells 3-4S of STA-1E with western half of East Distribution Cell
Inflows from C-51 West adjusted for same-day bypass to S-155A of L-8 runoff through S-5AE, increased to approx. maximum permitted by Draft Water Control Plan for STA-1E (target additional ave. annual bypass of 72,500 acre-feet per year)
Cells 1 and 2 considered off-line due to construction and operation of PSTA Demonstration Project

Simulation Type: Uncertainty Analysis

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	17.0	22.6	12.8
GM Outflow C (ppb)	13.5	18.9	9.4
Load Reduction %	87%	82%	90%
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	5.1%	0.0%
Mass Balance Error Mean & Max	0.8%	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	-	EDCW	3	4N	4S								
Vegetation Type	-->	EMG_3	EMG_3	SAV_3	SAV_3								
Inflow Fraction	-	0.55											
Downstream Cell Number	-	2	3	4									
Surface Area	km2	0.95	2.38	2.61	3.04								
Mean Width of Flow Path	km	0.66	1.55	1.55	1.55								
Number of Tanks in Series	-	0.5	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	90	40	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												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0095			0.0054								
Outflow Seepage Control Elev	cm	-87			-38								
Max Outflow Seepage Conc	ppb	20			20								
Seepage Recycle to Cell Number	-	4			7								
Seepage Recycle Fraction	-	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	50	50	50	50								
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3					
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22					
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300	300					
K = Net Settling Rate at Steady State	m/yr	16.8	16.8	52.5	52.5	16.8	52.5	52.5					
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40					
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100					
Z3 = Upper Penalty Depth	cm	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	3.94	4.40	4.86	5.31									5.31
Run Date	-	09/06/05	09/06/05	09/06/05	09/06/05									09/06/05
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		EDCW	3	4N	4S									Total
Downstream Cell Label		3	4N	4S	Outflow									-
Network Simulation Name	-	none	none	none	none									none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta									Uncerta
Surface Area	km2	0.95	2.38	2.61	3.04									8.98
Mean Rainfall	cm/yr	142.9	142.9	142.9	142.9									142.9
Mean ET	cm/yr	129.7	129.7	129.7	129.7									129.7
Cell Inflow Volume	hm3/yr	109.4	103.6	104.0	104.3									109.4
Cell Inflow Load	kg/yr	13233	11446	8923	3999									13233
Cell Inflow Conc	ppb	120.9	110.4	85.8	38.3									120.9
Treated Outflow Volume	hm3/yr	103.6	104.0	104.3	104.4									104.4
Treated Outflow Load	kg/yr	11446	8923	3999	1777									1777
Treated FWM Outflow Conc	ppb	110.4	85.8	38.3	17.0									17.0
Upper Confidence Limit	ppb	112.7	92.8	47.1	22.6									22.6
Lower Confidence Limit	ppb	107.6	77.7	30.2	12.8									12.8
Total Outflow Volume + Bypass	hm3/yr	103.6	104.0	104.3	104.4									104.4
Total Outflow Load + Bypass	kg/yr	11446	8923	3999	1777									1776.7
Total FWM Outflow Conc	ppb	110.4	85.8	38.3	17.0									17.0
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	1.95	1.94	1.94	1.93									1.95
Maximum Outflow	hm3/d	1.94	1.94	1.93	1.89									1.89
Surface Load Reduction	kg/yr	1786	2523	4924	2222									11456
Load Trapped in Sediments	kg/yr	1190	2604	5013	2325									11133
Overall Load Reduction	%	14%	22%	55%	56%									87%
Lower Confidence Limit	%	12%	17%	49%	52%									82%
Upper Confidence Limit	%	16%	28%	61%	58%									90%
Daily Geometric Mean	ppb	105.0	81.6	32.9	13.0									#N/A
Outflow Geo Mean - Composites	ppb	105.5	81.1	33.5	13.5									13.5
Upper Confidence Limit	ppb	108.1	88.30	42.2	18.9									18.9
Lower Confidence Limit	ppb	102.3	72.80	25.5	9.4									9.4
Frequency Outflow Conc > 10 ppb	%	100%	100%	100%	82%									82%
Frequency Outflow Conc > 20 ppb	%	100%	100%	98%	10%									39%
Frequency Outflow Conc > 50 ppb	%	100%	100%	3%	0%									10%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	94%									94%
95th Percentile Outflow Conc	ppb	131	94	48	22									22
Mean Biomass P Storage	mg/m2	3945	3435	1924	766									2147
Storage Increase / Net Removal	%	0%	0%	0%	0%									0%
Net Storage Turnover Rate	1/yr	11.1	11.1	34.9	34.9									20.2
Unit Area P Removal	g/m2-yr	1252	1094	1921	765									1240
Mean Water Load	cm/d	31.5	11.9	10.9	9.4									3.3
Max Water Load	cm/d	205.3	81.5	74.5	63.5									21.7
Mean Depth	cm	93	60	66	66									68
Minimum Depth	cm	68	22	36	38									36
Maximum Depth	cm	131	106	105	105									108
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%									0.0%
Flow/Width	m2/day	454	183	184	184									212.3
HRT Days	days	3.0	5.1	6.1	7.1									20.2
Mean Velocity	cm/sec	0.56	0.35	0.32	0.32									0.35
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%									0%
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	0.79	0.80	0.82	0.84									0.8
95th Percentile Outflow Load	kg/d	90.63	73.00	35.84	17.45									17.5
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	-	1.22	-	-	-									1
Range Check - Freq Depth < 10 cm	-	-	-	-	-									0
Range Check - Flow/Width	-	2.16	-	-	-									1
Range Check - Inflow Conc	-	-	-	-	-									0
Range Check - Outflow Conc	-	-	-	-	-									0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%									5.11%
Mass Balance Error	%	0.00%	0.00%	0.01%	0.01%									0.78%
Warning or Error Messages		Cell# 1 EDCW Depth out of calib. range for EMG_3: 93 vs. 35 - 76 cm Cell# 1 EDCW Flow/Width out of calib. range for EMG_3: 454 vs. 26 - 210 m2/day												2