Everglades Agricultural Area Regional Feasibility Study

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

Alternative No. 2 (Final Report)

(Contract No. CN040912-WO04 Phase 2)

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October 2005

October 3, 2005

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

Dear Mr. Vazquez:

Burns & McDonnell is pleased to submit this Final report on "Optimum Allocation of Loads to the STAs for the Period 2010-2014, Alternative No. 2". This document is intended for attachment to ADA's overall report on Task 3, and was prepared under ADA Engineering, Inc. Task Order No. BM-05WO04-02 dated April 27, 2005.

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

Certification

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

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

Date:________________

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1. INTRODUCTION

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

1.1. Background

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

1.2. Scope of Work

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

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

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

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

1.3. Analytical Methods for Estimating TP Reduction in STAs

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

www.wwalker.net/dmsta

1.4. Reference Information

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

1.4.1. Inflow Volumes, TP Concentrations and TP Loads

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

- Deliverable 1.1.2: *Evaluation of 2006 Hydrologic Simulation Results*, Final Report dated June 27, 2005;
- Deliverable 1.2A: *Inflow Data Sets for the Period 2010-2014,* Final Report dated September 29, 2005;
- Deliverable 1.3.2: *Historic Inflow Volumes and Total Phosphorus Concentrations by Source,* Final Report dated June 27, 2005;
- Deliverable 1.4.2: *Methodology for Development of Daily Total Phosphorus Concentrations,* Final Report dated June 30, 2005;
- Deliverable 1.5.2: *Inflow Data Sets for the Period 2006-2009,* Final Report dated August 9, 2005;

1.4.2. Basic Designs of Proposed STA Expansions

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

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

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

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

No information is presently available for the planned configuration and basic layout and design of the full conversion of Compartments B and C of the Talisman Land Exchange to use as stormwater treatment areas. The layout and configuration of those expanded stormwater treatment areas assumed for use in this analysis is described in Part 5, STA-2 and Part 8, STA-5 of this document.

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

1.4.3. Rainfall and Evapotranspiration

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

1.4.4. Previous Studies and Reports

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

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

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

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

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

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

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

Additionally, reference is made to the following documents prepared by Burns & McDonnell for ADA Engineering Co., Inc. under Tasks 2 and 3 of the SFWMD Contract No. CN040912-WO04.

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

- *Optimum Allocation of Loads to the STAs for the Period 2010-2014, Alternative No. 1,* Final Report dated October 3, 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.

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

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

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

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

2. DESCRIPTION OF ALTERNATIVE NO. 2

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

Upon the full build-out of Compartments B and C of the Talisman Land Exchange, and completion of the EAASR Compartment A-1, substantial additional acreage of water management and treatment area will be added in the south central and western parts of the EAA, suggesting that overall system performance during the period 2010-2014 would benefit from a redistribution of projected inflow volumes and TP loads.

Alternative No. 2 is structured to redistribute inflow volumes and TP loads in order to take advantage of and more fully utilize those additional water management areas. The basic concepts of Alternative No. 2 are described below and indicated graphically in Figure 2.1.

- Runoff from the S-5A Basin and the East Beach Water Control District (EBWCD) would delivered to STA-1W, constrained only by the hydraulic capacity of STA-1W;

- Potential inflows to STA-1W in excess of its hydraulic capacity would be delivered to STA-1E through G-311;

- The TP concentrations in discharges from STA-1W would be expected to normally exceed levels desirable for release to the Loxahatchee National Wildlife Refuge (LNWR). Those discharges would be directed to STA-2 and Compartment B for further treatment prior to their release to the Everglades Protection Area (EPA);

- Separation of the STA-1W discharges from the LNWR, and the delivery of those discharges to STA-2, would be effected through a partial enlargement of the L-7 Borrow Canal and the physical separation of the L-7 Borrow Canal from the interior of the LNWR through construction of a separation berm or levee east of the L-7 Borrow Canal. That separation berm or levee would be expected to extend along the entire length of the L-7 Borrow Canal between the STA-1 Inflow & Distribution Works at G-301 to Levee L-39 (levee forming the south line of the LNWR);

- A new gated control structure would be constructed basically in the alignment of L-39, withdrawing STA-1W discharges from the L-7 Borrow Canal and delivering those discharges to the STA-2 Supply Canal immediately downstream (southeast) of Pump Station S-6. At that point, those discharges would mix with discharges from Pump Station S-6;

- The existing STA-2 and STA-1W Supply and Inflow Canals would be enlarged to permit delivery of the aggregate flow downstream of S-6 to STA-2 and Compartment B;

- Under this alternative, Compartment B of the Talisman Land Exchange would be developed as a fourth flow path of STA-2. The STA-2 Inflow Canal would be extended north and west to serve as an inflow distribution canal along the north line of Compartment B;

- Runoff from the S-2/S-6 Basin and East Shore Water Control District/715 Farms Chapter 298 Districts (ESWCD) would continue to be delivered through S-6 to the expanded STA-2, to the extent that sufficient hydraulic capacity would exist to receive those inflows. During periods of high discharge from STA-1W, the hydraulic capacity of STA-2 and Compartment B is expected to be insufficient to accept all runoff from the S-2/S-6 Basin and ESWCD. Under those conditions, a part of the runoff from the S-2/S-6 Basin and ESWCD would be diverted west through the Cross Canal to the North New River Canal for treatment in STA-3/4;

- The partial diversion of runoff from the S-2/S-6 Basin and ESWCD to the North New River Canal is expected to require an enlargement of both the Cross Canal and North New River, and the possible need for a new control structure at the confluence of the Cross Canal and Hillsboro Canal;

Under Alternative No. 2, inflow volumes and TP loads to STA-5 and STA-6 would be identical to those considered in the earlier report on Alternative No. 1. Inflow volumes to the EAASR Compartment A-1 would be identical to those for Alternative No. 1, although TP concentrations in those inflows would vary from those considered for Alternative No. 1. Inflows to STA-3/4 would, with one exception, be consistent with those summarized in Deliverable 1.2A (e.g., consistent with the results of the ECP 2010 SFWMM simulation, modified as indicated in Deliverable 1.2A). That exception is that runoff volumes and TP loads from the S-2/S-6 Basin and ESWCD diverted from STA-2 would be added to the original projections of inflow volumes and loads to STA-3/4.

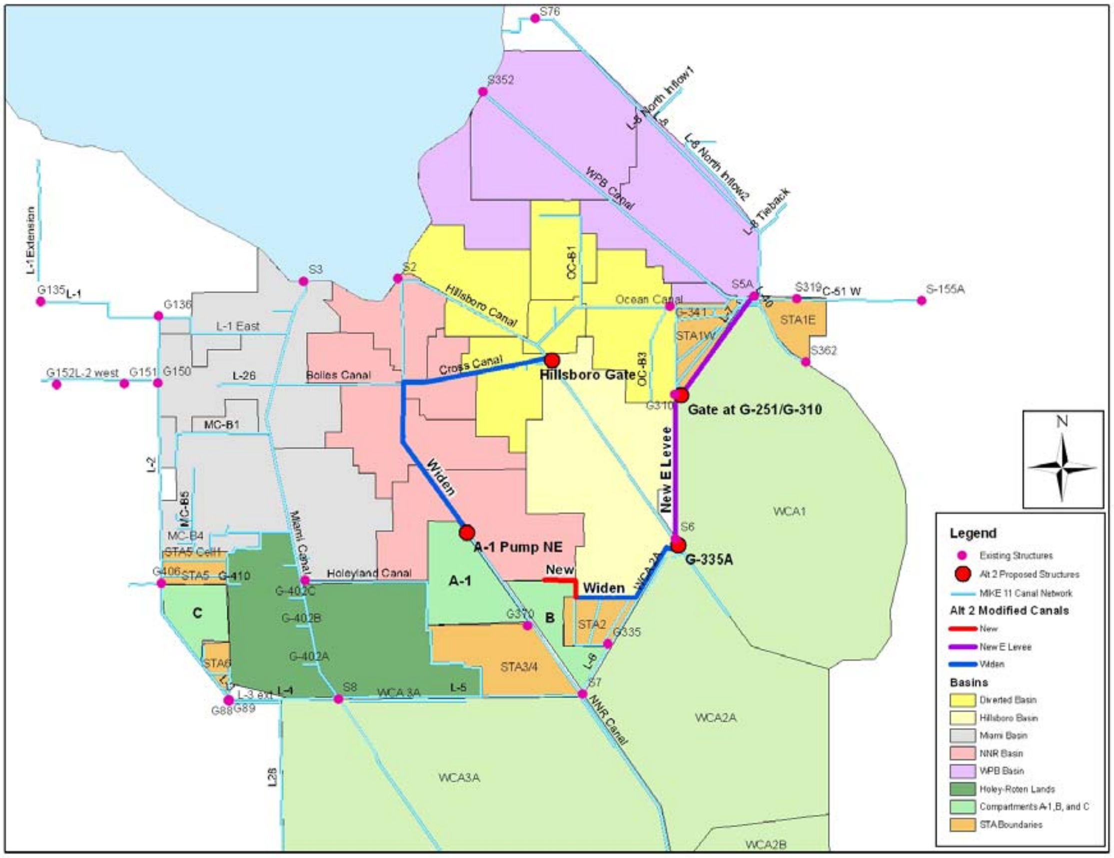

Figure 2.1 General Schematic of Alternative No. 2

3. STA-1W

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

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

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

In development of the South Florida Water Management Model (SFWMM) 2010 ECP simulation on which the estimated inflow volumes and TP loads 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-1W in reducing total phosphorus loads and concentrations:

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

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

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

A summary of the total estimated average annual inflows to the STA-1 Inflow and Distribution Works is presented in Table 3.1.

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

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

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

3.1. 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.

For analysis of Alternative No. 2, the distribution of STA-1 Inflow & Distribution Works inflows between STA-1W and STA-1E was estimated consistent with that developed in Deliverable 2.2; that distribution of inflows and its genesis is repeated herein for convenience.

The various simulations are based on 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 STA-1E through 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 3.1.

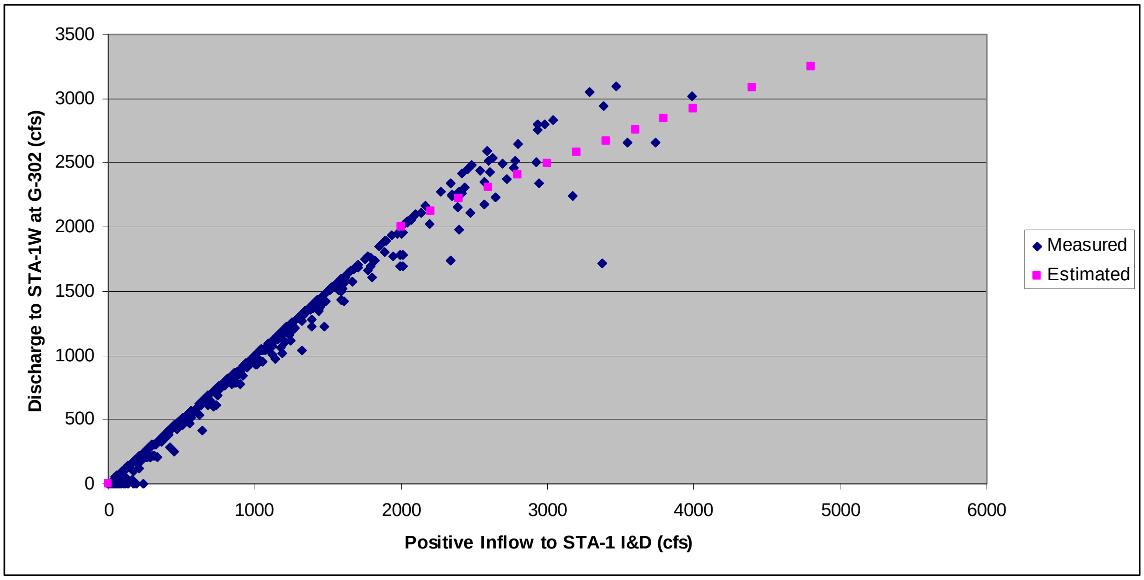

Figure 3.1 Distribution of Discharges through G-302

3.2. DMSTA2 Analysis of STA-1W

The following is a description of the case considered for analysis of STA-1W in this Alternative No. 2.

- **STA1W Alt2:** 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 2010-2014. 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.

Table 3.3 presents a summary of the results of the DMSTA2 analysis for STA-1W as it is influenced by Alternative No. 2; the analysis includes Water Years 1966-2000. Summary DMSTA2 input and output data for this case are included in Appendix A.

Table 3.2 Summary of DMSTA2 Analysis, STA-1W Alternative No. 2

Parameter	Units	Summary of Results STA1W_Alt2
Average Annual Inflow		
Volume	1,000 ac-ft	238.6
TP Load	metric tons	51.30
FWM TP Concentration	ppb	174
Average Annual Outflow		
Volume	1,000 ac-ft	239.4
FWM TP Concentration		
Upper Confidence Limit	ppb	22.1
Mean Estimate	ppb	27.3
Lower Confidence Limit	ppb	34.2
Geometric Mean TP Conc.		
Upper Confidence Limit	ppb	17.2
Mean Estimate	ppb	22.1
Lower Confidence Limit	ppb	29.0
TP Load (Using Mean FWM Conc.)	metric tons	8.05
For Detailed Results, See Appendix A		Table A.1
Summary of Bypasses and Diversions		
Water Supply to LEC and L-8		
Volume	1,000 ac-ft	14.2
TP Load	metric tons	2.23
FWM TP Concentration	ppb	127
Divert to STA-1E via G-311		
Volume	1,000 ac-ft	8.9
TP Load	metric tons	2.19
FWM TP Concentration	ppb	198

For Alternative No. 2, STA-1W was analyzed in DMSTA2 as one part of a “network simulation” including STA-1W, STA-2 (expanded to include all of Compartment B of the Talisman Land Exchange), the EAASR Compartment A-1, and STA-3/4. The 7/01/2005 version of DMSTA2 does not include capability for a full uncertainty analysis; specifically, it cannot develop upper confidence limit estimates. The upper confidence limit concentrations reported in Table 3.2 were estimated using the following approximation:

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

4. STA-1E

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

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

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

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

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

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

For the period 2010-2014, inflows to the C-51 West Canal under this Alternative No. 2 are considered limited to:

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

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

Table 4.1 Estimated Inflows to C-51 West Canal

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

The inflow to be treated is considered as delivered to STA-1E at S-319. In addition, under this Alternative No. 2, an estimated average annual volume of approximately 9,000 acre-feet per year at a flow-weighted mean TP concentration of 198 ppb (see Table 3.2) is also considered delivered to STA-1E through G-311.

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

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

- **2010 Base:** For this case, inflows to STA-1E from the C-51 West Canal at S-319 and at S-362 were assumed to be consistent with the summary data presented in Table 4.1 (e.g., bypass of inflow volumes from the L-8 Basin, but before inclusion of inflows at G-311). This case is identical to that developed for Alternative No. 1;

- **STA1E_Alt2:** Identical to the above case (2010 Base), with the exception that projected diversions from STA-1W through G-311 are added to the STA-1E inflows.

4.2. Summary of DMSTA2 Results

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

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

Parameter	Units	Summary of Results by Case	
		2010 Base	STA1E_Alt2
Average Annual Inflow			
Volume	1,000 ac-ft	171.8	180.9
TP Load	metric tons	27.03	29.05
FWM TP Concentration	ppb	128	130
Average Annual Outflow			
Volume	1,000 ac-ft	168.5	177.6
FWM TP Concentration			
Upper Confidence Limit	ppb	10.1*	11.9*
Mean Estimate	ppb	13.3*	15.6
Lower Confidence Limit	ppb	17.9	20.6
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	7.6	8.4
Mean Estimate	ppb	10.6	11.8
Lower Confidence Limit	ppb	15.0	16.6
TP Load (Using Mean FWM Conc.)	metric tons	2.77	3.42
For Detailed Results, See Appendix A		Table A.3	Table A.2
Summary of Bypasses and Diversions			
Bypass Through S-155A			
Volume	1,000 ac-ft	36.3	36.3
TP Load	metric tons	4.69	4.69
FWM TP Concentration	ppb	105	105

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

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

5. STA-2

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

Under Alternative No. 2, Cell 4 of STA-2 is considered to be one cell of the new fourth flow path on Compartment B of the Talisman Land Exchange (see Part 5.1 of this document).

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

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

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

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

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

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

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

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

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

Under Alternative No. 2, potential inflows to the expanded STA-2 would be increased to include discharges from STA-1W. A summary of the potential average annual inflows to STA-2 (prior to consideration of limitations due to hydraulic capacity) under Alternative No. 2 is presented in Table 5.1.

Table 5.1 Potential Average Annual Inflows to Expanded STA-2

Source	Potential Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
S-2/S-6 Basin	236,624	28,327	97	Deliverable 1.2A, Table 3.3
ESWCD/715	29,818	4,588	125	Deliverable 1.2A, Table 2.6
Current S-5A Diversion	58,778	11,152	154	Deliverable 1.2A, Table 3.15
STA-1W Discharge	239,401	8,054	27.3	Table 3.2
Seepage from WCA-2A	27,500	509	15	See text
Lake Okeechobee	832	86	84	Water Supply to LEC SA2 (WL2351)
Total Inflow	592,953	52,716	72	
Assumed Bypass	832	86	84	Water Supply to LEC SA2 (WL2351)
Inflow to be Treated	**592,121**	**52,630**	**72**	

5.1. Assumed Configuration of Fourth Flow Path on Compartment B

For this analysis, the new fourth flow path on Compartment B was assumed to consist of four cells in series, occupying the entire Compartment B (including Cell 4 of STA-2, which is assumed to be hydraulically severed from the existing STA-2). The following summarizes the assumed configuration of the new fourth flow path:

1. Cell No. 4A would be the most upstream cell, and would consist of that part of Compartment B of the Talisman Land Exchange lying north of Cell 4. Inflows to Cell No. 4A would consist of discharges from the STA-2 inflow canal extended

north and west to serve as an east-west inflow distribution canal along the north line of Cell 4A, and would, from that inflow distribution canal, flow south to Cell 4B. The estimated effective treatment area of Cell 4A is 17.32 square kilometers (4,280 acres). Cell No. 4A was assumed to be vegetated with emergent vegetation, and considered as EMG_3 in the DMSTA2 analysis.

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

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

4. Cell No. 4D would consist of that part of Compartment B of the Talisman Land Exchange lying between the FPL high-voltage overhead transmission line and Levee L-6. It would receive outflows from Cell No. 4C and carry those flows southeasterly to L-6. The estimated effective treatment area of Cell No. 4D is 1,380 acres. Cell No. 4D was assumed to be vegetated with Submerged Aquatic Vegetation, and considered as SAV_3 in the DMSTA2 analysis.

The total effective treatment area in the new fourth flow path of STA-2 is estimated to be 8,940 acres.

5.2. Cases Considered in DMSTA2 Analysis of STA-2

The DMSTA2 analysis of STA-2 under Alternative No. 2 considered the following inflow case:

- **STA2_Alt2:** This case was developed upon the assumption that all potential inflows to STA-2 listed in Table 5.1 would be included in the inflow volumes and TP loads to STA-2, to the extent that hydraulic capacity is available in the expanded STA-2 to receive those inflows.

For this analysis, the peak hydraulic capacity of STA-2 is taken as 4,720 cfs, distributed to the various flow paths as:

- 750 cfs to Cells 1;
- 840 cfs to Cell 2;
- 1,300 cfs to Cell 3;
- 1,800 cfs to Cells 4A through 4D.

The above estimate of the peak hydraulic capacity of the expanded STA-2 is an initial approximation only, and was developed without benefit of topographic data over much of Compartment B. Ongoing hydraulic analyses by ADA Engineering suggest that, in particular, the assumed hydraulic capacity of Cells 4A through 4D may be less than that considered herein. It is probable that future, more detailed hydraulic analyses would result in some adjustment to the overall hydraulic capacity of the expanded STA-2, as well as a redistribution of that peak inflow between the various flow paths. Such adjustments, if necessary, could be expected to result in a modified distribution of volumes and TP loads to the expanded STA-2 and STA-3/4, with attendant impact on the projected performance of each of those two treatment areas.

Estimated daily inflows to the Hillsboro Canal (comprised of basin runoff from the S-2/S-6 Basin, the ESWCD, and that part of the historic S-5A Basin tributary to the Ocean Canal west of Structure G-341) were added to simulated daily discharges from STA-1W and the induced seepage inflows from WCA-2A to the STA-2 Supply Canal. On those days when the summation of all those flows exceeded the assigned STA-2 hydraulic capacity, the excess was assigned as diversion through the Cross Canal to the North New River Canal and STA-3/4.

5.3. Summary of DMSTA2 Results

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

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

Parameter	Units	Summary for STA2_Alt2
Average Annual Inflow		
Volume	1,000 ac-ft	563.4
TP Load	metric tons	49.58
FWM TP Concentration	ppb	71
Average Annual Outflow		
Volume	1,000 ac-ft	565.0
FWM TP Concentration		
Upper Confidence Limit*	ppb	12.2
Mean Estimate	ppb	14.9
Lower Confidence Limit	ppb	18.5
Geometric Mean TP Conc.		
Upper Confidence Limit	ppb	9.2
Mean Estimate	ppb	11.8
Lower Confidence Limit	ppb	15.5
TP Load (Using Mean FWM Conc.)	metric tons	10.36
For Detailed Results, See Appendix A		Table A.4
Summary of Bypasses and Diversions		
Water Supply to LEC		
Volume	1,000 ac-ft	0.8
TP Load	metric tons	0.09
FWM TP Concentration	ppb	84
Diversion to NNRC		
Volume	1,000 ac-ft	29.0
TP Load	metric tons	3.00
FWM TP Concentration	ppb	84

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

For Alternative No. 2, STA-2 was analyzed in DMSTA2 as one part of a "network simulation" including STA-1W, STA-2 (expanded to include all of Compartment B of the Talisman Land Exchange), the EAASR Compartment A-1, and STA-3/4. The 7/01/2005 version of DMSTA2 does not include capability for a full uncertainty analysis; specifically, it cannot develop upper confidence limit estimates. The upper confidence limit concentrations reported in Table 5.2 were estimated using the following approximation:

Log (Upper C.L.)/Log (Mean Est.)=Log (Mean Est.)/Log (Lower C.L.)

6. EAASR COMPARTMENT A-1

Summaries of the estimated average annual inflows to Compartment A-1 of the EAA Storage Reservoir Project under Alternative No. 2 are presented in Table 6.1.

Table 6.1 Estimated Average Annual Inflows to EAASR A-1, W.Y. 1966-2000

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
Inflows Taken from ECP 2010 SFWMM Simulation with TP loads from Deliverable 1.2A				
S-2/S-7 Basin Runoff	72,078	7,235	81	Deliverable 1.2A Table 3.6
S-3/S-8 Basin Runoff	59,784	5,910	80	Deliverable 1.2A, Table 3.11*
Lake Okeechobee Releases				
S-351	131,928	16,689	103	Deliverable 1.2A, Table 6.14
S-354	152,793	16,968	90	Deliverable 1.2A, Table 6.16
Total Inflow	**416,583**	**46,802**	**91**	

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

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

6.1. SFWMM Simulation of EAASR Compartment A-1

The basic structure of the EAASR Compartment A-1 considered in the ECP 2010 SFWMM simulation is summarized graphically in Figure 6.1, taken from Deliverable 1.2A.

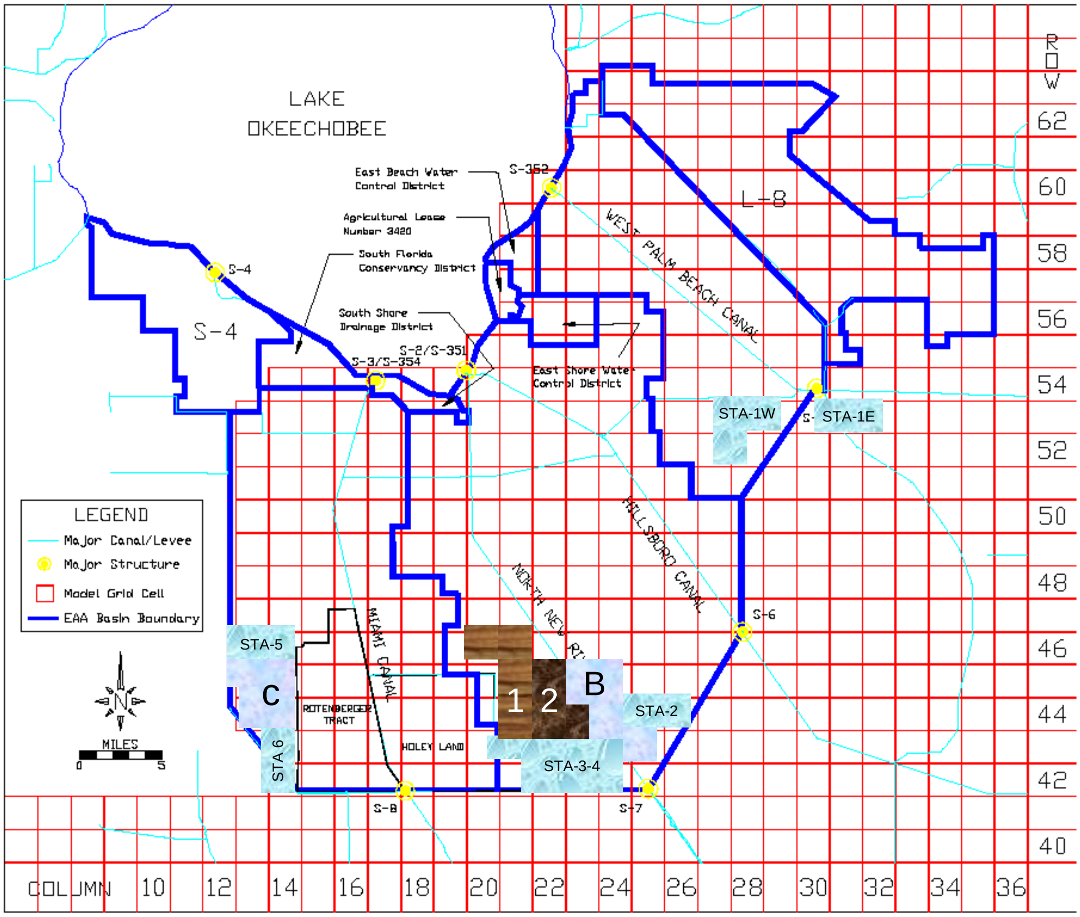

Figure 6.1 ECP 2010 Model Configuration for EAASR Compartment A-1

Flow terms reflected in the ECP 2010 SFWMM model of the EAASR Compartment A-1 are shown in Figure 6.2, also taken from Deliverable 1.2A.

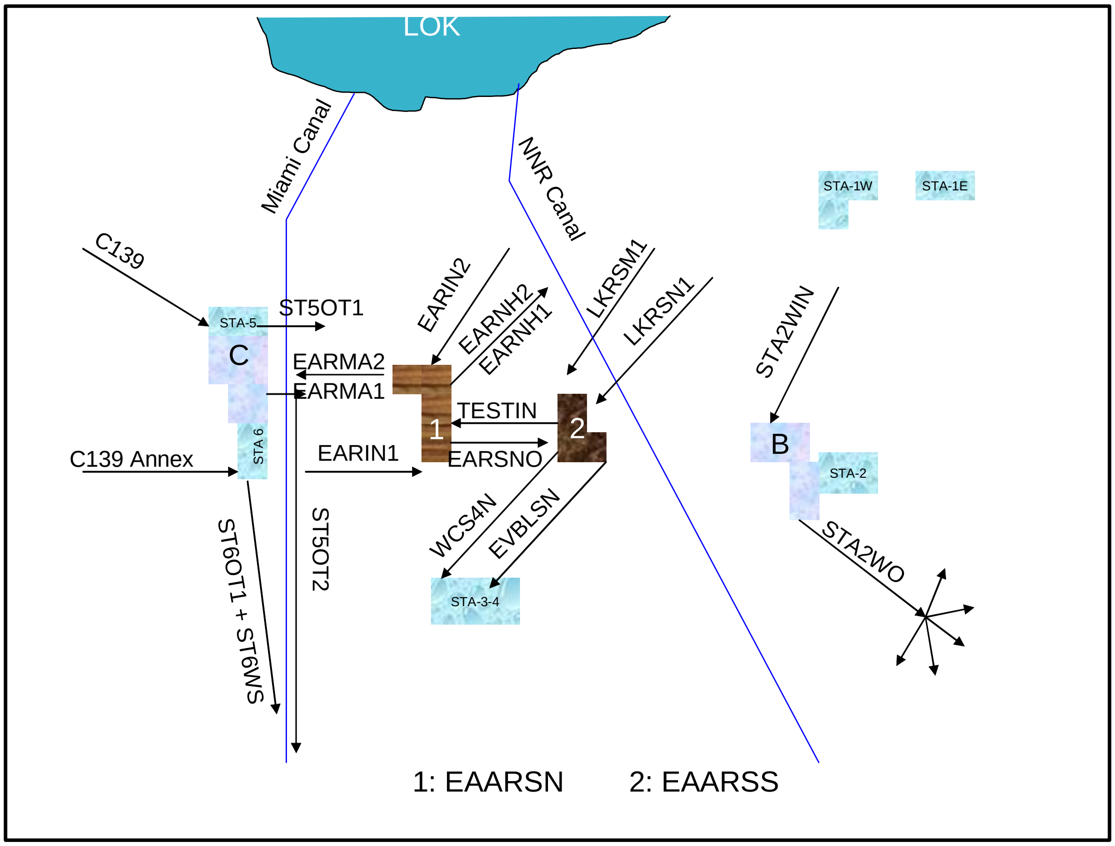

Figure 6.2 Flow Terms in ECP 2010 Model of EAASR Compartment A-1

The A-1 Reservoir introduces a number of new flow terms to the SFWMM model (Figure 6.2). The new reservoir-related terms are defined below:

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

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

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

6.2. DMSTA2 Analysis of Compartment A-1

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

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

Table 6.2 summarizes the range of depths in the reservoir as taken from the ECP 2010 simulation for each "surge tank"; the results of the daily averaging of those depths; and parallel data taken from the DMSTA2 simulation.

Table 6.2 Simulated Reservoir Depths

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

Table 6.3 presents a summary of the results of the DMSTA2 analysis of Compartment A-1 of the EAASR under this Alternative No.2.

Table 6.3 Results of DMSTA2 Analysis of EAASR Compartment A-1

Parameter	Units	Summary of Results
		A1_Base
Average Annual Inflow		
Volume	1,000 ac-ft	416.9
TP Load	metric tons	46.84
FWM TP Concentration	ppb	91
Average Annual Outflow to STA-3/4		
Volume	1,000 ac-ft	235.1
FWM TP Concentration		
Upper Confidence Limit	ppb	71.7
Mean Estimate	ppb	76.2
Lower Confidence Limit	ppb	81.1
Geometric Mean TP Conc.		
Upper Confidence Limit	ppb	68.9
Mean Estimate	ppb	74.4
Lower Confidence Limit	ppb	80.4
TP Load (Using Mean FWM Conc.)	metric tons	22.08
For Detailed Results, See Appendix A		Table A.5
Summary of Total Irrigation Releases to EAA		
Taken Directly from ECP 2010 SFWMM Simulation*		
Volume	1,000 ac-ft	180.0
TP Load	metric tons	N/A
FWM TP Concentration	ppb	N/A
From Alternative 2 Analysis**		
Volume	1,000 ac-ft	145.7
TP Load	metric tons	14.39
FWM TP Concentration	ppb	80

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

For Alternative No. 2, Compartment A-1 of the EAASR was analyzed in DMSTA2 as one part of a "network simulation" including STA-1W, STA-2 (expanded to include all of Compartment B of the Talisman Land Exchange), the EAASR Compartment A-1, and STA-3/4. The 7/01/2005 version of DMSTA2 does not include capability for a full uncertainty analysis; specifically, it cannot develop upper confidence limit estimates. The upper confidence limit concentrations reported in Table 6.3 were estimated using the following approximation:

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

The simulated average annual outflow to STA-3/4 (235,100 acre-feet per year) closely approximates that taken from the SFWMM ECP 2010 simulation (233,685 acre-feet per year). While Table 6.3 suggests a significant variance between the DMSTA2 and SFWMM simulations for irrigation releases to the EAA, that variance is considered to result more from the approximations necessary to conduct the DMSTA2 simulation than from a true "shortfall" in those irrigation releases.

7. STA-3/4

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

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

- Basin runoff from the S-2/S-7 Basin (North New River Canal);
- Regulatory releases from Lake Okeechobee at S-351 directed to the North New River Canal;
- Basin runoff from the S-3/S-8 Basin (Miami Canal);
- Basin runoff from the Chapter 298 South Shore Drainage District (SSDD) diverted from Lake Okeechobee (diverted to the Miami Canal);
- Basin runoff from the Chapter 298 South Florida Conservancy District No. 5 (SFCD), also known as the S-236 Basin, diverted to the Miami Canal;

- Basin runoff from the C-139 Basin diverted to the Miami Canal through Structure G-136 (term "G136SO" from the ECP 2006 SFWMM simulation);

- Regulatory releases from Lake Okeechobee at S-354 directed to the Miami Canal;

- Discharges from the EAASR Compartment A-1.

In addition, for Alternative No. 2, inflows to STA-3/4 include volumes and TP loads diverted from the Hillsboro Canal due to constraints on the maximum inflow rate to STA-2 imposed by the anticipated hydraulic capacity of STA-2 (expanded to include all of Compartment B of the Talisman Land Exchange).

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

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

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

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

In addition, the total phosphorus concentration in discharges from the C-139 Basin through G-136 were assumed reduced by 10% from historic levels as a result of ongoing BMP implementation in that basin.

A summary of the estimated average annual inflows to STA-3/4 is presented in Table 7.1. Inflow data is summarized for two basic cases:

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

- As modified for Alternative No. 2, including those volumes and TP loads diverted from the Hillsboro Canal

Table 7.1 Estimated Inflows to STA-3/4

Source	Estimated Average Annual Inflow, WY 1966-2000			Remarks
	Volume (ac-ft)	TP Load (kg)	TP Conc. (ppb)	
Inflows Taken from ECP 2010 SFWMM Simulation with TP loads from Deliverable 1.2A				
S-2/S-7 Basin	109,310	10,747	80	Deliverable 1.2A, Table 3.5
S-3/S-8 Basin	170,624	17,460	83	Deliverable 1.2A, Table 3.10
SSDD	10,559	1,390	107	Deliverable 1.2A, Table 2.9
SFCD	21,145	3,183	122	Deliverable 1.2A, Table 2.12
C-139 Basin (G-136)	13,204	2,958	182	Deliverable 1.2A, Table 4.3
Lake Flow Through Release at S-351	1,551	132	69	Deliverable 1.2A, Table 6.10
Lake Flow Through Release at S-354	26,581	2,115	65	Deliverable 1.2A, Table 6.12
Lake WS Release at S-351	11,484	1,189	84	Deliverable 1.2A, Table 6.7
Lake WS Release at S-354	109,279	9,391	70	Deliverable 1.2A, Table 6.9
A-1 Reservoir Outflow to STA-3/4	233,685	26,254	91	Volume from Deliverable 1.2A, Table 7.1; TP concentration assigned equal to flow-weighted mean TP concentration in A-1 Reservoir inflows
Total Inflow	707,422	74,819	86	
Assumed Bypass	120,763	10,580	71	Water Supply to LEC and Big Cypress Reservation
Inflow to be Treated	**586,659**	**64,239**	**89**	
Inflows Modified for Alternative 2				
S-2/S-7 Basin	109,310	10,747	80	Deliverable 1.2A, Table 3.5
S-3/S-8 Basin	170,624	17,460	83	Deliverable 1.2A, Table 3.10
SSDD	10,559	1,390	107	Deliverable 1.2A, Table 2.9
SFCD	21,145	3,183	122	Deliverable 1.2A, Table 2.12
C-139 Basin (G-136)	13,204	2,958	182	Deliverable 1.2A, Table 4.3
Lake Flow Through Release at S-354	26,581	2,115	65	Deliverable 1.2A, Table 6.12
Lake WS Release at S-351	11,484	1,189	84	Deliverable 1.2A, Table 6.7
Lake WS Release at S-354	109,279	9,391	70	Deliverable 1.2A, Table 6.9
Diversion from Hillsboro Canal	29,023	3,003	84	Table 5.2
A-1 Reservoir Outflow to STA-3/4	235,105	22,084	76	TP Load and Concentration based on mean estimate from DMSTA2 analysis see Table 6.3
Total Inflow	736,314	73,520	81	
Assumed Bypass	120,763	10,580	71	Water Supply to LEC and Big Cypress Reservation
Inflow to be Treated	**615,551**	**62,940**	**83**	

7.1. Summary of DMSTA2 Results

Table 7.2 presents a summary of the results of the DMSTA2 analysis for STA-3/4. Summary DMSTA2 input and output data are included in Appendix A.

Table 7.2 Summary of DMSTA2 Analysis, STA-3/4, WY 1966-2000

Parameter	Units	Summary of Results
		STA34_Alt2
Average Annual Inflow		
Volume	1,000 ac-ft	617.4
TP Load	metric tons	63.07
FWM TP Concentration	ppb	83
Average Annual Outflow		
Volume	1,000 ac-ft	598.4
FWM TP Concentration		
Upper Confidence Limit*	ppb	15.0
Mean Estimate	ppb	18.3
Lower Confidence Limit	ppb	22.6
Geometric Mean TP Conc.		
Upper Confidence Limit*	ppb	11.3
Mean Estimate	ppb	14.2
Lower Confidence Limit	ppb	18.3
TP Load (Using Mean FWM Conc.)	metric tons	13.49
For Detailed Results, See Appendix A		Table A.6
Summary of Bypasses and Diversions		
Water Supply Bypass		
Volume	1,000 ac-ft	120.8
TP Load	metric tons	10.58
FWM TP Concentration	ppb	71

The EAASR Compartment A-1 and STA-3/4 were analyzed using the "network simulation" feature of DMSTA2. The 7/01/2005 version of DMSTA2 does not include capability for a full uncertainty analysis; specifically, it cannot develop upper confidence limit estimates. The upper confidence limit concentrations reported in Table 7.2 were estimated using the following approximation:

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

8. STA-5

Under Alternative No. 2, the analysis for STA-5 does not vary from that presented for Alternative No. 1. The information reported under Alternative No. 1 for STA-5 is repeated herein for the reader's convenience.

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

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

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

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

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

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

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

8.1. Cases Considered in DMSTA2 Analysis of STA-5

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

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

- **2010 Base Emg:** This case is identical to “2006 Base” with the single exception that the downstream cells (1B, 2B, 3B, 4B, 5B and 6B) were assigned the EMG_3 calibration data set in lieu of SAV_3.

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

8.2. Summary of DMSTA2 Results

Table 8.1 presents a summary of the results of the DMSTA2 analyses for STA-5. Summary DMSTA2 input and output data for each case are included in Appendix A. Data for cases “2010 Base” and “2010 Base Emg” is for Water Years 1995-2005.

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

Table 8.1 Summary of DMSTA2 Analyses, STA-5

Parameter	Units	Summary of Results by Case	
		2010 Base	2010 Base Emg
Average Annual Inflow			
Volume	1,000 ac-ft	159.1	159.1
TP Load	metric tons	39.14	39.14
FWM TP Concentration	ppb	199	199
Average Annual Outflow			
Volume	1,000 ac-ft	159.2	159.2
FWM TP Concentration			
Upper Confidence Limit	ppb	8.2*	14.7*
Mean Estimate	ppb	9.6*	21.0
Lower Confidence Limit	ppb	11.7*	30.7
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	4.7	11.0
Mean Estimate	ppb	5.8	17.1
Lower Confidence Limit	ppb	7.8	26.5
TP Load (Using Mean FWM Conc.)	metric tons	1.89	4.13
For Detailed Results, See Appendix A		Table A.7	Table A.8

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

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

9. STA-6

Under Alternative No. 2, the analysis for STA-6 does not vary from that presented for Alternative No. 1. The information reported under Alternative No. 1 for STA-6 is repeated herein for the reader's convenience.

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

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

9.1. Cases Considered in DMSTA2 Analysis of STA-6

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

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

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

9.2. Summary of DMSTA2 Results

Table 9.1 presents a summary of the results of the DMSTA2 analyses for STA-6. Summary DMSTA2 input and output data for each case are included in Appendix A.

Table 9.1 Summary of DMSTA2 Analyses, STA-6

Parameter	Units	Summary of Results by Case	
		2010 Alt1	2010 Alt1 SAV
Average Annual Inflow			
Volume	1,000 ac-ft	40.2	40.2
TP Load	metric tons	4.88	4.88
FWM TP Concentration	ppb	98	98
Average Annual Outflow			
Volume	1,000 ac-ft	40.3	40.3
FWM TP Concentration			
Upper Confidence Limit	ppb	19.6	14.1*
Mean Estimate	ppb	25.5	17.1
Lower Confidence Limit	ppb	32.8	20.8
Geometric Mean TP Conc.			
Upper Confidence Limit	ppb	15.9	10.5
Mean Estimate	ppb	21.8	13.4
Lower Confidence Limit	ppb	28.9	17.2
TP Load (Using Mean FWM Conc.)	metric tons	1.27	0.85
For Detailed Results, See Appendix A		Table A.9	Table A.10

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

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.

10. SUMMARY PROJECTIONS

A summary of the projected performance of the various stormwater treatment areas over the period 2010-2014 is presented in Table 10.1. 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 10.1 for STA-5 include the full range of uncertainty associated with the performance of the six downstream cells.

Table 10.1 Summary Projections for all STAs, Alternative 2 for 2010-2014

Parameter	Units	Summary of DMSTA2 Results by Treatment Area and Case							
		STA-1W	STA-1E	STA-2	EAASR A-1	STA-3/4	STA-5	STA-6	
		STA1W_Alt2	STA1E_Alt2	STA2_Alt2	2010 Base	STA34_Alt2	2010 (Ave)	Sec1_USSO_SAV	All
Effective Treatment Area	acres	6,670	6,175	15180	16,000	16,543	13,150	897	58,615
Average Annual Inflow									
Volume	1,000 ac-ft	238.6	180.9	324.0	416.9	382.2	159.1	40.2	1742.0
TP Load	metric tons	51.3	29.05	41.5	46.8	40.98	39.14	4.88	253.72
FWM TP Concentration	ppb	174	130	104	91	87	199	98	118
Average Annual Outflow									
Volume	1,000 ac-ft	239.4	177.6	565.0	235.1	598.4	159.2	40.3	1540.5
FWM TP Concentration									
Upper Confidence Limit	ppb	22.1	11.9	12.2	71.7	15.0	8.2	14.1*	---
Mean Estimate	ppb	27.3	15.6	14.9	76.2	18.3	15.3	17.1	16.4
Lower Confidence Limit	ppb	34.2	20.6	18.5	81.1	22.6	30.7	20.8	---
Geometric Mean TP Conc.									
Upper Confidence Limit	ppb	17.2	8.4	9.2	68.9	11.3	4.7	10.5	---
Mean Estimate	ppb	22.1	11.8	11.8	74.4	14.2	11.5	13.4	---
Lower Confidence Limit	ppb	29.0	16.6	15.5	80.4	18.3	26.5	17.2	---
TP Load (Using Mean FWM Conc.)	metric tons	8.05	3.42	10.36	22.08	13.49	3.01	0.85	31.13
Summary of Bypass Volumes and Loads									
Bypass Volume, TP Load and TP Concentration for each Treatment Area									
Volume	1,000 ac-ft	14.2	36.3	0.8	0.0	120.8	0.0	0.0	172.0
TP Load	metric tons	2.23	4.69	0.09	0.00	10.58	0.00	0.00	17.58
FWM TP Concentration	ppb	127	105	84	---	71	---	---	83

Notes:
(1) Surface area of EAASR Compartment A-1 excluded from computation of total effective treatment area
(2) Average annual inflows to STA-3/4 listed above include only direct inflow at G-370 and G-372; outflow from EAASR Compartment A-1 also directed to STA-3/4
(3) Outflows from EAASR Compartment A-1 excluded from computation of total outlfows, as they are directed to STA-3/4
(4) At STA-1E,STA-2 and STA-5, FWM TP concentrations include estimates below the lower calibration range limit of 15 ppb for SAV_3
(5) At STA-5, upper confidence limit reported based on the assumption that the six downstream cells act as SAV_3; lower confidence limit reported based on the assumption that the six downstream cells act as EMG_3. Mean estimates of outflow concentrations and outflow TP load taken as the average of the estimates for those two conditions.
(6) STA-1W, STA-2, STA-3/4 analyzed in DMSTA2 as a part of a network with the EAASR Compartment A-1. The 7/01/2005 version of DMSTA2 is not structured to compute the upper confidence limit of TP concentrations in a network simulation. The upper confidence limits for both FWM and Geometric mean TP concentrations were estimated as described in Parts 3, 5, 6 and 7 of this document.
(7) Average annual inflows to STA-2 listed above include only direct inflow at S-6; outflow from STA-1W also directed to STA-2
(8) Outflows from STA-1W are excluded from total outflows, as they are directed to STA-2

In the above table, bypasses at STA-1E are untreated bypass through S-155A. All other bypasses indicated in Table 10.1 consist of water supply releases bypassing the STAs.

The total inflow volume shown in Table 10.1 varies from that reported in Table 8.1 of Deliverable 1.2A due primarily to the addition of 27,500 acre-feet per year in STA-2 inflows due to seepage return to the STA-2 Supply Canal from the L-6 Borrow Canal and WCA-2A;

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

Table 10.2 summarizes estimated average annual back pumping or back flow to Lake Okeechobee during the period 2010-2014.

Table 10.2 Estimated Back Pumping to Lake Okeechobee, 2010-2014

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

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

As noted throughout this document, the water quality analyses summarized in Table 10.1 were developed upon the assumption that water supply releases destined for the Lower East Coast and certain other destinations (such as the Big Cypress Reservation) are permitted to bypass the STAs when the receiving water conservation area is at or below the floor of its regulation schedule. For the period 2010-2014, this assumption is of particular significance only at STA-3/4.

In addition, Alternative No. 2 is expected to include some enlargement of the North New River Canal, with the result that estimated back pumping to Lake Okeechobee at S-2 and S-3 might be significantly reduced from that reflected in the ECP 2010 SFWMM simulation.

No additional DMSTA2 simulations were conducted to assess the impact of inclusion of those additional volumes and TP loads in the inflow to STA-3/4. The impact of inclusion of those incremental inflow volumes and loads on discharges from STA-3/4 can be expected to closely parallel those forecast in the analyses for Alternative No. 1.

Appendix A

DMSTA2 Output Data

List of Tables

Table A.1 STA-1W: Case "STA1W Alt2"

DMSTA2- Inputs & Outputs — Project: PROJECT_ALT2_NETWORK — Model Release: 9/30/2005 — Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	STA1W_Alt2
Input Series Name		TS_STA1W_Alt
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-1W with Long Term Plan Enhancements
Potential inflows include all basin runoff from S-5A Basin and EBWCD to STA-1 Inflow & Distribution Works
Delivery to STA-1W at G-301 based on analysis of historic distribution
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)**0.8984

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	27.3	#N/A	#N/A
GM Outflow C (ppb)	22.1	#N/A	#N/A
Load Reduction %	84%	#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	0.1%
Warning/Error Messages	7	

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	6.06	6.37	6.71	7.03	7.34	7.69	8.00	8.43					8.43
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05					09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65					05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65					05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00					04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784	12784	12784					12784
Cell Label		1A	1B	3	2A	2B	4	5A	5B					Total
Downstream Cell Label		1B	3	Outflow	2B	4	Outflow	5B	Outflow					-
Network Simulation Name	-	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net					Alt2_Net
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	129.8	123.7	128.2					128.8
Cell Inflow Volume	hm3/yr	111.8	140.2	142.4	50.0	49.0	47.9	132.4	120.3					294.3
Cell Inflow Load	kg/yr	19495	16346	8775	8721	6025	2308	23086	16475					51303
Cell Inflow Conc	ppb	174.3	116.6	61.6	174.3	123.0	48.2	174.3	137.0					174.3
Treated Outflow Volume	hm3/yr	140.2	142.4	143.9	49.0	47.9	46.8	120.3	104.6					295.3
Treated Outflow Load	kg/yr	16346	8775	4031	6025	2308	1205	16475	2817					8054
Treated FWM Outflow Conc	ppb	116.6	61.6	28.0	123.0	48.2	25.7	137.0	26.9					27.3
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	140.2	142.4	143.9	49.0	47.9	46.8	120.3	104.6					295.3
Total Outflow Load + Bypass	kg/yr	16346	8775	4031	6025	2308	1205	16475	2817					8053.5
Total FWM Outflow Conc	ppb	116.6	61.6	28.0	123.0	48.2	25.7	137.0	26.9					27.3
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	1.56	1.69	1.73	0.70	0.71	0.73	1.84	1.82					4.10
Maximum Outflow	hm3/d	1.69	1.73	1.77	0.71	0.73	0.74	1.82	1.84					4.35
Surface Load Reduction	kg/yr	3149	7572	4744	2697	3716	1103	6611	13658					43249
Load Trapped in Sediments	kg/yr	3794	7711	4884	2618	3722	1127	2872	12840					39568
Overall Load Reduction	%	16%	46%	54%	31%	62%	48%	29%	83%					84%
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	102.5	51.3	21.2	108.2	33.7	14.7	152.1	18.3					#N/A
Outflow Geo Mean - Composites	ppb	108.2	54.3	23.0	117.4	42.3	20.9	134.6	22.1					22.1
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%	100%	100%	100%	98%	100%	100%					100%
Frequency Outflow Conc > 20 ppb	%	100%	100%	67%	100%	100%	56%	100%	61%					90%
Frequency Outflow Conc > 50 ppb	%	100%	67%	0%	100%	26%	0%	100%	1%					63%
Freq Outflow Volume > 10 ppb	%	100%	100%	100%	100%	100%	99%	100%	100%					100%
95th Percentile Outflow Conc	ppb	131	77	37	137	60	33	180	37					35
Mean Biomass P Storage	mg/m2	3953	2564	1179	4313	1956	779	3965	1386					2204
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	35.0	11.1	35.0					23.3
Unit Area P Removal	mg/m2-yr	1258	2558	1176	1374	1953	778	1263	1384					1466
Mean Water Load	cm/d	10.2	12.7	9.4	7.2	7.0	9.1	15.9	3.5					3.0
Max Water Load	cm/d	51.6	56.2	41.6	36.5	37.3	50.1	81.1	19.6					15.2
Mean Depth	cm	70	70	69	57	57	57	52	53					60
Minimum Depth	cm	55	55	45	18	18	11	1	1					23
Maximum Depth	cm	111	111	112	73	77	86	99	94					98
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.9%	3.5%					1.7%
Flow/Width	m2/day	278	349	354	57	67	101	204	141					204.3
HRT Days	days	6.8	5.5	7.4	8.0	8.1	6.3	3.3	14.8					20.1
Mean Velocity	cm/sec	0.46	0.57	0.59	0.11	0.14	0.20	0.45	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	1.01	1.01	1.02	0.41	0.41	0.41	1.03	0.98					2.4
95th Percentile Outflow Load	kg/d	128.15	72.56	35.70	53.52	23.09	12.58	146.47	30.63					78.3
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	-	-	-	-	-	-	-	-	-					0
Range Check - Flow/Width	-	1.33	-	-	-	0.41	0.62	-	0.87					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%	0.03%	0.03%	0.04%	-0.45%	-0.05%					-0.20%
Warning or Error Messages														7

Warning or Error Messages:
Cell# 1 1A Flow/Width out of calib. range for EMG_3: 278 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: 67 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: 101 vs. 162 - 374 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: 141 vs. 162 - 374 m2/day

Table A.2 STA-1E: Case "STA1E Alt2"

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

Input Variable	Units	Value
Design Case Name	-	STA1E_Alt2
Input Series Name		TS_1E_Alt2
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	0
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-1E with East and West Distribution Cells
Inlfows include all C-51 West Basin and Acme Basin B runoff; L-8 Basin runoff volume through S-5AE bypassed thru S-155A
Inflows also include discharges from G-311 from STA-1W Alt. 2 analysis. 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)	15.6	20.6	11.9
GM Outflow C (ppb)	11.8	16.6	8.4
Load Reduction %	88%	84%	91%
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	9	

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

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	10.26	10.71	11.17	11.43	11.86	12.31	12.77	13.03	13.49	13.74	14.17	14.63	14.63
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784	12784
Cell Label		EDCE	1	2	EDCW	3	4N	4S	WDCW	7	WDCE	5	6	Total
Downstream Cell Label		1	2	Outflow	3	4N	4S	Outflow	7	6	5	6	Outflow	-
Network Simulation Name	-	none	none	none	none	none	none	none	none	none	none	none	none	none
Simulation Type	-	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta	Uncerta
Surface Area	km2	0.95	2.25	2.23	0.95	2.38	2.61	3.04	1.17	1.69	1.17	2.31	4.25	25.00
Mean Rainfall	cm/yr	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9
Mean ET	cm/yr	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7
Cell Inflow Volume	hm3/yr	44.6	56.8	50.6	87.1	87.2	87.5	87.8	35.7	30.9	55.8	50.1	82.3	223.2
Cell Inflow Load	kg/yr	5810	4761	2718	11329	9697	7244	2886	4648	2968	7262	5321	5013	29049
Cell Inflow Conc	ppb	130.1	83.8	53.8	130.1	111.2	82.8	32.9	130.1	95.9	130.1	106.1	60.9	130.1
Treated Outflow Volume	hm3/yr	56.8	50.6	45.4	87.2	87.5	87.8	88.3	30.9	31.8	50.1	50.4	85.5	219.1
Treated Outflow Load	kg/yr	4761	2718	736	9697	7244	2886	1234	2968	1718	5321	3294	1446	3416
Treated FWM Outflow Conc	ppb	83.8	53.8	16.2	111.2	82.8	32.9	14.0	95.9	54.0	106.1	65.3	16.9	15.6
Upper Confidence Limit	ppb	87.0	61.7	21.1	113.9	90.7	41.4	18.6	102.4	65.0	111.0	76.1	22.4	20.6
Lower Confidence Limit	ppb	80.1	45.3	12.5	107.9	73.8	25.3	10.7	88.6	43.2	100.3	54.1	12.9	11.9
Total Outflow Volume + Bypass	hm3/yr	56.8	50.6	45.4	87.2	87.5	87.8	88.3	30.9	31.8	50.1	50.4	85.5	219.1
Total Outflow Load + Bypass	kg/yr	4761	2718	736	9697	7244	2886	1234	2968	1718	5321	3294	1446	3415.9
Total FWM Outflow Conc	ppb	83.8	53.8	16.2	111.2	82.8	32.9	14.0	95.9	54.0	106.1	65.3	16.9	15.6
Bypass Load	kg/yr	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bypass Load	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Inflow	hm3/d	0.51	0.55	0.55	0.99	1.00	1.02	1.04	0.41	0.40	0.63	0.62	1.06	2.53
Maximum Outflow	hm3/d	0.55	0.55	0.56	1.00	1.02	1.04	1.07	0.40	0.42	0.62	0.65	1.10	2.73
Surface Load Reduction	kg/yr	1049	2043	1982	1632	2453	4358	1652	1680	1250	1941	2027	3567	25633
Load Trapped in Sediments	kg/yr	921	1734	1941	1171	2533	4446	1750	1279	1320	1400	2106	3764	24364
Overall Load Reduction	%	18%	43%	73%	14%	25%	60%	57%	36%	42%	27%	38%	71%	88%
Lower Confidence Limit	%	15%	37%	69%	12%	20%	54%	55%	32%	35%	23%	31%	68%	84%
Upper Confidence Limit	%	22%	50%	75%	17%	31%	66%	57%	41%	50%	31%	46%	73%	91%
Daily Geometric Mean	ppb	75.7	49.6	12.2	102.4	76.9	27.4	9.9	89.0	47.9	98.7	59.3	12.1	#N/A
Outflow Geo Mean - Composites	ppb	77.2	50.3	12.8	104.0	77.9	28.2	10.5	90.2	48.8	100.0	60.1	12.9	11.8
Upper Confidence Limit	ppb	80.1	58.17	17.6	106.6	85.9	36.6	15.0	96.8	59.9	105.0	71.0	18.1	16.6
Lower Confidence Limit	ppb	73.7	41.90	9.2	100.6	68.7	20.8	7.5	82.8	38.1	94.0	48.8	9.1	8.4
Frequency Outflow Conc > 10 ppb	%	100%	100%	78%	100%	100%	100%	56%	100%	100%	100%	100%	77%	70%
Frequency Outflow Conc > 20 ppb	%	100%	100%	8%	100%	100%	91%	4%	100%	100%	100%	100%	9%	25%
Frequency Outflow Conc > 50 ppb	%	100%	48%	0%	100%	100%	1%	0%	100%	42%	100%	93%	0%	7%
Freq Outflow Volume > 10 ppb	%	100%	100%	90%	100%	100%	100%	74%	100%	100%	100%	100%	89%	85%
95th Percentile Outflow Conc	ppb	99	62	21	130	93	42	19	106	63	119	75	22	21
Mean Biomass P Storage	mg/m2	3040	2420	872	3872	3342	1707	577	3460	2453	3756	2862	888	2044
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Net Storage Turnover Rate	1/yr	11.1	11.1	34.9	11.1	11.1	34.9	34.9	11.1	11.1	11.1	11.1	34.9	16.7
Unit Area P Removal	mg/m2-yr	968	771	871	1232	1064	1703	576	1093	781	1196	911	886	974
Mean Water Load	cm/d	12.9	6.9	6.2	25.1	10.0	9.2	7.9	8.4	5.0	13.1	5.9	5.3	2.4
Max Water Load	cm/d	53.2	24.5	24.8	103.8	41.9	39.0	34.3	34.6	23.6	54.1	27.0	25.0	10.1
Mean Depth	cm	67	52	61	93	59	65	65	101	50	60	51	64	63
Minimum Depth	cm	51	40	56	90	40	59	57	90	34	37	35	56	52
Maximum Depth	cm	95	77	77	111	90	90	91	104	77	95	79	91	88
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Flow/Width	m2/day	185	100	89	361	154	155	155	130	72	204	85	140	139.6
HRT Days	days	5.2	7.5	9.9	3.7	5.8	7.1	8.2	12.0	9.9	4.6	8.6	12.2	25.8
Mean Velocity	cm/sec	0.32	0.22	0.17	0.45	0.30	0.28	0.28	0.15	0.17	0.39	0.19	0.25	0.25
Seepage Outflow / Total Outflow	%	0%	0%	0%	0%	0%	0%	0%	14%	0%	10%	0%	0%	5%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95th Percentile Outflow Volume	hm3/d	0.37	0.36	0.35	0.65	0.66	0.67	0.67	0.26	0.26	0.40	0.40	0.68	1.7
95th Percentile Outflow Load	kg/d	35.61	21.40	7.29	78.31	59.67	26.20	12.44	26.06	16.15	44.28	29.29	14.96	34.5
Simulated / Specified Mean Depth	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 1 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Release 2 Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Outflow Demand Met	%	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Range Check - Mean Depth	-	-	-	0.99	1.21	-	-	-	1.32	-	-	-	-	3
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Flow/Width	-	-	-	0.55	1.72	-	0.96	0.96	-	-	-	-	0.86	5
Range Check - Inflow Conc	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Range Check - Outflow Conc	-	-	-	-	-	-	-	0.94	-	-	-	-	-	1
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mass Balance Error	%	0.00%	0.01%	0.01%	0.00%	0.02%	0.02%	0.02%	0.00%	0.02%	0.00%	0.01%	0.01%	0.02%

Warning or Error Messages (Overall: 9)

Cell# 3 2 Depth out of calib. range for SAV_3: 61 vs. 62 - 87 cm
Cell# 3 2 Flow/Width out of calib. range for SAV_3: 89 vs. 162 - 374 m2/day
Cell# 4 EDCW Depth out of calib. range for EMG_3: 93 vs. 35 - 76 cm
Cell# 4 EDCW Flow/Width out of calib. range for EMG_3: 361 vs. 26 - 210 m2/day
Cell# 6 4N Flow/Width out of calib. range for SAV_3: 155 vs. 162 - 374 m2/day
Cell# 7 4S Flow/Width out of calib. range for SAV_3: 155 vs. 162 - 374 m2/day
Cell# 7 4S Outflow Conc out of calib. range for SAV_3: 14 vs. 15 - 153 ppb
Cell# 8 WDCW Depth out of calib. range for EMG_3: 101 vs. 35 - 76 cm
Cell# 12 6 Flow/Width out of calib. range for SAV_3: 140 vs. 162 - 374 m2/day

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

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

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

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

Simulation Type: Uncertainty Analysis

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

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

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

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

Warning or Error Messages (11):
Cell# 3 2 Depth out of calib. range for SAV_3: 61 vs. 62 - 87 cm
Cell# 3 2 Flow/Width out of calib. range for SAV_3: 85 vs. 162 - 374 m2/day
Cell# 3 2 Outflow Conc out of calib. range for SAV_3: 14 vs. 15 - 153 ppb
Cell# 4 EDCW Depth out of calib. range for EMG_3: 92 vs. 35 - 76 cm
Cell# 4 EDCW Flow/Width out of calib. range for EMG_3: 343 vs. 26 - 210 m2/day
Cell# 6 4N Flow/Width out of calib. range for SAV_3: 147 vs. 162 - 374 m2/day
Cell# 7 4S Flow/Width out of calib. range for SAV_3: 147 vs. 162 - 374 m2/day
Cell# 7 4S Outflow Conc out of calib. range for SAV_3: 12 vs. 15 - 153 ppb
Cell# 8 WDCW Depth out of calib. range for EMG_3: 101 vs. 35 - 76 cm
Cell# 12 6 Flow/Width out of calib. range for SAV_3: 132 vs. 162 - 374 m2/day
Cell# 12 6 Outflow Conc out of calib. range for SAV_3: 14 vs. 15 - 153 ppb

Table A.4 STA-2: Case “STA2 Alt2”

DMSTA2- Inputs & Outputs — **Project: PROJECT_ALT2_NETWORK** — Model Release: 9/30/2005 — Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	STA2_Alt2
Input Series Name		TS_STA2_Alt2
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Case Description:
STA-2 With Compartment B; max inflow to Compartment B = 1,800 cfs
Inflow time series includes allowance of 38 cfs (27,500 ac-ft/yr) seepage from WCA-2A to Supply Canal
Analysis for WY 1966-2000 includes all basin runoff from S-2/S-6 Basin, plus discharge from STA-1W
Inflows from S-5A Basin, S-2/S-6 North, and ESWCD/715 Farms included; maximum overall inflow 4,720 cfs

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	14.9	#N/A	#N/A
GM Outflow C (ppb)	11.8	#N/A	#N/A
Load Reduction %	79%	#N/A	#N/A
Bypass Load (%)	5.7%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.1%
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	-	1	2	3	4A	4B	5	6					
Vegetation Type	-->	PEW_3	PEW_3	SAV_3	EMG_3	SAV_3	SAV_3	SAV_3					
Inflow Fraction	-	0.12	0.14	0.21	0.53								
Downstream Cell Number	-				5	6	7						
Surface Area	km2	7.28	9.19	9.19	17.32	7.70	5.59	5.59					
Mean Width of Flow Path	km	1.58	2.00	2.00	6.11	2.50	2.60	4.07					
Number of Tanks in Series	-	3.0	3.0	6.0	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	40	60	60	60	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				4.4								
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm	0.008			0.002	0.004	0.0055	0.002					
Inflow Seepage Control Elev	cm	76			67	67	67	67					
Inflow Seepage Conc	ppb	20			20	20	20	15					
Outflow Seepage Rate	(cm/d) / cm	0.004	0.006	0.01	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	1								
Seepage Recycle Fraction	-	1	1	1	0.78								
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	200	200	200	200	200	200	200					
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	34.9	34.9	52.5	16.8	52.5	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	7.71	8.17	8.91	9.34	9.80	10.23	10.69						10.69
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05						09/30/05
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		1	2	3	4A	4B	5	6						Total
Downstream Cell Label		Outflow	Outflow	Outflow	4B	5	6	Outflow						-
Network Simulation Name	-	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net						Alt2_Net
Simulation Type	-	Base	Base	Base	Base	Base	Base	Base						Base
Surface Area	km2	7.28	9.19	9.19	17.32	7.70	5.59	5.59						61.86
Mean Rainfall	cm/yr	128.6	128.6	128.6	128.6	128.6	128.6	128.6						128.6
Mean ET	cm/yr	130.3	130.3	130.3	130.3	130.3	130.3	130.3						130.3
Cell Inflow Volume	hm3/yr	87.7	102.3	153.5	351.5	339.2	339.5	339.9						694.9
Cell Inflow Load	kg/yr	6310	7362	11042	24866	14612	7758	5302						49579
Cell Inflow Conc	ppb	72.0	72.0	72.0	70.7	43.1	22.9	15.6						71.3
Treated Outflow Volume	hm3/yr	101.4	102.1	153.3	339.2	339.5	339.9	340.0						696.9
Treated Outflow Load	kg/yr	1974	1889	2527	14612	7758	5302	3974						10364
Treated FWM Outflow Conc	ppb	19.5	18.5	16.5	43.1	22.9	15.6	11.7						14.9
Upper Confidence Limit	ppb	#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
Total Outflow Volume + Bypass	hm3/yr	101.4	102.1	153.3	375.0	339.5	339.9	340.0						732.7
Total Outflow Load + Bypass	kg/yr	1974	1889	2527	17615	7758	5302	3974						13367.1
Total FWM Outflow Conc	ppb	19.5	18.5	16.5	47.0	22.9	15.6	11.7						18.2
Bypass Load	kg/yr	0	0	0	3003	0	0	0						3003.1
Bypass Load	%	0.0	0.0	0.0	0.1	0.0	0.0	0.0						0.1
Maximum Inflow	hm3/d	1.22	1.42	2.13	3.94	4.05	4.12	4.17						8.70
Maximum Outflow	hm3/d	1.32	1.50	2.22	4.05	4.12	4.17	4.21						9.26
Surface Load Reduction	kg/yr	4336	5472	8516	10254	6853	2456	1328						39215
Load Trapped in Sediments	kg/yr	4771	5640	8591	10263	7113	2646	1511						40536
Overall Load Reduction	%	69%	74%	77%	41%	47%	32%	25%						79%
Lower Confidence Limit	%	#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
Daily Geometric Mean	ppb	14.6	12.9	10.0	36.7	16.4	10.0	6.8						#N/A
Outflow Geo Mean - Composites	ppb	15.9	14.4	11.8	39.2	18.9	12.1	8.5						11.8
Upper Confidence Limit	ppb	#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
Frequency Outflow Conc > 10 ppb	%	96%	90%	64%	100%	98%	71%	42%						69%
Frequency Outflow Conc > 20 ppb	%	20%	14%	10%	100%	47%	3%	0%						22%
Frequency Outflow Conc > 50 ppb	%	0%	0%	0%	3%	0%	0%	0%						2%
Freq Outflow Volume > 10 ppb	%	98%	97%	86%	100%	99%	87%	62%						85%
95th Percentile Outflow Conc	ppb	25	23	22	49	28	19	15						19
Mean Biomass P Storage	mg/m2	987	925	936	1860	926	475	271						1096
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%	0%						0%
Net Storage Turnover Rate	1/yr	23.2	23.2	34.9	11.1	34.9	34.9	35.0						20.9
Unit Area P Removal	mg/m2-yr	655	614	935	593	924	473	270						655
Mean Water Load	cm/d	3.3	3.0	4.6	5.6	12.1	16.6	16.6						3.1
Max Water Load	cm/d	16.7	15.4	23.2	22.7	52.6	73.7	74.5						14.1
Mean Depth	cm	59	55	68	66	73	73	68						65
Minimum Depth	cm	40	31	55	53	46	45	42						46
Maximum Depth	cm	95	92	102	90	113	112	101						98
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%						0.0%
Flow/Width	m2/day	152	140	210	157	371	358	229						213.2
HRT Days	days	17.8	18.0	14.9	11.8	6.1	4.4	4.1						21.3
Mean Velocity	cm/sec	0.30	0.30	0.36	0.28	0.59	0.57	0.39						0.37
Seepage Outflow / Total Outflow	%	0%	0%	0%	1%	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	0.74	0.82	1.23	2.61	2.60	2.60	2.64						5.4
95th Percentile Outflow Load	kg/d	17.56	18.28	25.69	122.79	68.55	48.86	37.99						99.8
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
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-	-						0
Range Check - Flow/Width	-	-	-	-	-	-	-	-						0
Range Check - Inflow Conc	-	-	-	-	-	-	-	-						0
Range Check - Outflow Conc	-	-	-	-	-	-	-	0.79						1
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						0.00%
Mass Balance Error	%	0.01%	0.01%	0.07%	0.01%	0.02%	0.04%	0.07%						0.04%
Warning or Error Messages		Bypass occurred around cell 4 Cell# 7 6 Outflow Conc out of calib. range for SAV_3: 12 vs. 15 - 153 ppb												2

Table A.5 EAASR A-1: Case "A1 Base"

DMSTA2- Inputs & Outputs | **Project: PROJECT_ALT2_NETWORK** | Model Release: 9/30/2005 | Current Date: 9/30/2005

Input Variable	Units	Value
Design Case Name	-	A1_Base
Input Series Name		TS_RES_Base
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

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

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	76.2	#N/A	#N/A
GM Outflow C (ppb)	74.4	#N/A	#N/A
Load Reduction %	22%	#N/A	#N/A
Bypass Load (%)	0.0%		

Diagnostics		
H20 Balance Error Mean & Max	0.0%	0.0%
Mass Balance Error Mean & Max	0.0%	0.0%
Iterations & Convergence	2	0.2%
Warning/Error Messages	0	

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

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	1.06												1.06
Run Date	-	09/30/05												09/30/05
Starting Date for Simulation	-	05/01/65												05/01/65
Starting Date for Output	-	05/01/65												05/01/65
Ending Date	-	04/30/00												04/30/00
Output Duration	days	12784												12784
Cell Label		A-1												Total
Downstream Cell Label		Outflow												-
Network Simulation Name	-	Alt2_Net												Alt2_Net
Simulation Type	-	Base												Base
Surface Area	km2	39.54												39.54
Mean Rainfall	cm/yr	130.0												130.0
Mean ET	cm/yr	122.3												122.3
Cell Inflow Volume	hm3/yr	514.2												514.2
Cell Inflow Load	kg/yr	46836												46836
Cell Inflow Conc	ppb	91.1												91.1
Treated Outflow Volume	hm3/yr	290.0												290.0
Treated Outflow Load	kg/yr	22084												22084
Treated FWM Outflow Conc	ppb	76.2												76.2
Upper Confidence Limit	ppb	#N/A												#N/A
Lower Confidence Limit	ppb	#N/A												#N/A
Total Outflow Volume + Bypass	hm3/yr	469.7												469.7
Total Outflow Load + Bypass	kg/yr	36476												36476.1
Total FWM Outflow Conc	ppb	77.7												77.7
Bypass Load	kg/yr	0												0.0
Bypass Load	%	0.0												0.0
Maximum Inflow	hm3/d	6.87												6.87
Maximum Outflow	hm3/d	5.81												5.81
Surface Load Reduction	kg/yr	24752												24752
Load Trapped in Sediments	kg/yr	8357												8357
Overall Load Reduction	%	22%												22%
Lower Confidence Limit	%	#N/A												#N/A
Upper Confidence Limit	%	#N/A												#N/A
Daily Geometric Mean	ppb	70.1												#N/A
Outflow Geo Mean - Composites	ppb	74.4												74.4
Upper Confidence Limit	ppb	#N/A												#N/A
Lower Confidence Limit	ppb	#N/A												#N/A
Frequency Outflow Conc > 10 ppb	%	100%												100%
Frequency Outflow Conc > 20 ppb	%	100%												100%
Frequency Outflow Conc > 50 ppb	%	98%												100%
Freq Outflow Volume > 10 ppb	%	62%												62%
95th Percentile Outflow Conc	ppb	117												117
Mean Biomass P Storage	mg/m2	390												390
Storage Increase / Net Removal	%	0%												0%
Net Storage Turnover Rate	1/yr	19.0												19.0
Unit Area P Removal	mg/m2-yr	211												211
Mean Water Load	cm/d	3.6												3.6
Max Water Load	cm/d	17.4												17.4
Mean Depth	cm	165												165
Minimum Depth	cm	1												1
Maximum Depth	cm	372												372
Frequency Depth < 10 cm	%	10.5%												10.5%
Flow/Width	m2/day	217												217.0
HRT Days	days	46.3												46.3
Mean Velocity	cm/sec	0.15												0.15
Seepage Outflow / Total Outflow	%	9%												14%
Release 1 Outflow Volume	hm3/yr	179.7												179.7
Release 2 Outflow Volume	hm3/yr	0.0												0.0
95th Percentile Outflow Volume	hm3/d	3.26												3.3
95th Percentile Outflow Load	kg/d	238.75												238.8
Simulated / Specified Mean Depth	%	0.85												0.8
Release 1 Demand Met	%	81%												0.8
Release 2 Demand Met	%	#N/A												#N/A
Outflow Demand Met	%	101%												1.0
Range Check - Mean Depth	-	-												0
Range Check - Freq Depth < 10 cm	-	-												0
Range Check - Flow/Width	-	-												0
Range Check - Inflow Conc	-	-												0
Range Check - Outflow Conc	-	-												0
Water Balance Error	%	0.00%												0.00%
Mass Balance Error	%	0.03%												0.03%
Warning or Error Messages														0

Table A.6 STA-3/4: Case "STA34 Alt2"

DMSTA2- Inputs & Outputs — Project: PROJECT_ALT2_NETWORK — Model Release: 9/30/2005 — Current Date: 9/30/2005

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

Input Variable	Units	Value
Design Case Name	-	STA34_ALT2
Input Series Name		TS_34_Base
Starting Date for Simulation	-	05/01/65
Ending Date for Simulation	-	04/30/00
Starting Date for Output	-	05/01/65
Integration Steps Per Day	-	4
Number of Iterations	-	
Output Averaging Interval	days	30
Inflow Conc Scale Factor	-	1
Rainfall P Conc	ppb	10
Atmospheric P Load (Dry)	mg/m2-yr	20

Simulation Type:

Output Variable	Mean	Lower CL	Upper CL
FWM Outflow C (ppb)	18.3	#N/A	#N/A
GM Outflow C (ppb)	14.2	#N/A	#N/A
Load Reduction %	79%	#N/A	#N/A
Bypass Load (%)	0.0%		

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

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

Output Variables	Units	1	2	3	4	5	6	7	8	9	10	11	12	Overall
Execution Time	sec/yr	8.34	8.83	9.57	10.03	10.57	11.11							11.11
Run Date	-	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05	09/30/05							09/30/05
Starting Date for Simulation	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Starting Date for Output	-	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65	05/01/65							05/01/65
Ending Date	-	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00	04/30/00							04/30/00
Output Duration	days	12784	12784	12784	12784	12784	12784							12784
Cell Label		1A	1B	2A	2B	3A	3B							Total
Downstream Cell Label		1B	Outflow	2B	Outflow	3B	Outflow							-
Network Simulation Name	-	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net	Alt2_Net							Alt2_Net
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	304.6	299.1	251.3	255.3	205.6	188.9							761.5
Cell Inflow Load	kg/yr	25226	15900	20812	13428	17028	9640							63066
Cell Inflow Conc	ppb	82.8	53.2	82.8	52.6	82.8	51.0							82.8
Treated Outflow Volume	hm3/yr	299.1	294.8	255.3	254.7	188.9	188.5							738.1
Treated Outflow Load	kg/yr	15900	5413	13428	4668	9640	3408							13489
Treated FWM Outflow Conc	ppb	53.2	18.4	52.6	18.3	51.0	18.1							18.3
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	299.1	294.8	255.3	254.7	188.9	188.5							738.1
Total Outflow Load + Bypass	kg/yr	15900	5413	13428	4668	9640	3408							13488.8
Total FWM Outflow Conc	ppb	53.2	18.4	52.6	18.3	51.0	18.1							18.3
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	3.33	3.29	2.75	2.75	2.25	2.22							8.33
Maximum Outflow	hm3/d	3.29	3.30	2.75	2.77	2.22	2.24							8.30
Surface Load Reduction	kg/yr	9326	10488	7383	8760	7388	6232							49577
Load Trapped in Sediments	kg/yr	9094	10869	7533	9143	6743	6519							49901
Overall Load Reduction	%	37%	66%	35%	65%	43%	65%							79%
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	44.8	11.0	44.6	11.2	44.2	9.8							#N/A
Outflow Geo Mean - Composites	ppb	47.6	14.6	47.3	14.4	47.5	14.3							14.2
Upper Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Lower Confidence Limit	ppb	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A							#N/A
Frequency Outflow Conc > 10 ppb	%	100%	83%	100%	81%	100%	82%							80%
Frequency Outflow Conc > 20 ppb	%	100%	21%	100%	20%	100%	19%							52%
Frequency Outflow Conc > 50 ppb	%	47%	0%	44%	0%	42%	0%							19%
Freq Outflow Volume > 10 ppb	%	100%	93%	100%	93%	100%	91%							93%
95th Percentile Outflow Conc	ppb	60	23	59	23	58	22							23
Mean Biomass P Storage	mg/m2	2322	772	2299	782	2203	732							1493
Storage Increase / Net Removal	%	0%	0%	0%	0%	0%	0%							0%
Net Storage Turnover Rate	1/yr	11.1	34.9	11.1	34.9	11.1	34.9							17.5
Unit Area P Removal	mg/m2-yr	739	770	732	781	702	731							745
Mean Water Load	cm/d	6.8	5.8	6.7	6.0	5.9	5.8							3.1
Max Water Load	cm/d	27.1	23.3	26.7	23.4	23.4	24.9							12.4
Mean Depth	cm	67	64	69	65	58	60							64
Minimum Depth	cm	39	28	50	35	9	29							32
Maximum Depth	cm	95	91	95	89	80	80							89
Frequency Depth < 10 cm	%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%							0.0%
Flow/Width	m2/day	244	182	238	174	115	106							180.9
HRT Days	days	9.9	11.0	10.3	10.8	9.8	10.4							20.6
Mean Velocity	cm/sec	0.42	0.33	0.40	0.31	0.23	0.20							0.32
Seepage Outflow / Total Outflow	%	2%	1%	1%	0%	4%	0%							3%
Release 1 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
Release 2 Outflow Volume	hm3/yr	0.0	0.0	0.0	0.0	0.0	0.0							0.0
95th Percentile Outflow Volume	hm3/d	2.28	2.29	1.91	1.93	1.48	1.52							5.7
95th Percentile Outflow Load	kg/d	126.73	48.49	105.38	41.17	81.07	32.12							121.7
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	-	-	-	-	-	-	0.97							1
Range Check - Freq Depth < 10 cm	-	-	-	-	-	-	-							0
Range Check - Flow/Width	-	1.16	-	1.13	-	-	0.66							3
Range Check - Inflow Conc	-	-	-	-	-	-	-							0
Range Check - Outflow Conc	-	-	-	-	-	-	-							0
Water Balance Error	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.00%
Mass Balance Error	%	0.10%	0.02%	0.10%	0.02%	0.04%	0.08%							0.10%
Warning or Error Messages		Cell# 1 1A Flow/Width out of calib. range for EMG_3: 244 vs. 26 - 210 m2/day Cell# 3 2A Flow/Width out of calib. range for EMG_3: 238 vs. 26 - 210 m2/day Cell# 6 3B Depth out of calib. range for SAV_3: 60 vs. 62 - 87 cm Cell# 6 3B Flow/Width out of calib. range for SAV_3: 106 vs. 162 - 374 m2/day												4

Table A.7 STA-5: Case "2010 Base"

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

Input Variable	Units	Value	Case Description:	Mean	Lower CL	Upper CL	Diagnostics		
Design Case Name	-	2010 Base	STA-5 Expanded to Include Full Build-out of Compartment C						
Input Series Name		TS_Base	2010-2014; downstream cells considered as SAV_3; Inflows limited to C-139 Basin runoff						
Starting Date for Simulation	-	05/01/94	Historic Inflow Concentrations Reduced by 10% for ongoing BMP implementation in basin						
Ending Date for Simulation	-	04/30/05	STA-6 Section 2 converted to use as Cell 6B						
Starting Date for Output	-	05/01/94							
Integration Steps Per Day	-	4	Simulation Type: Uncertainty Analysis						
Number of Iterations	-	0	Output Variable	Mean	Lower CL	Upper CL	Diagnostics		
Output Averaging Interval	days	30	FWM Outflow C (ppb)	9.6	11.7	8.2	H20 Balance Error Mean & Max	0.0%	0.0%
Inflow Conc Scale Factor	-	1	GM Outflow C (ppb)	5.8	7.8	4.7	Mass Balance Error Mean & Max	0.0%	0.0%
Rainfall P Conc	ppb	10	Load Reduction %	95%	94%	96%	Iterations & Convergence	3	0.1%
Atmospheric P Load (Dry)	mg/m2-yr	20	Bypass Load (%)	0.0%			Warning/Error Messages	18	

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

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

Warning or Error Messages:

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

Table A.8: STA-5: Case "2010 Base Emg"

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

Input Variable	Units	Value	Case Description:
Design Case Name	-	2010 Base Em	STA-5 Expanded to Include Full Build-out of Compartment C
Input Series Name		TS_Base	2010-2014; downstream cells considered as EMG_3; Inflows limited to C-139 Basin runoff
Starting Date for Simulation	-	05/01/94	Historic Inflow Concentrations Reduced by 10% for ongoing BMP implementation in basin
Ending Date for Simulation	-	04/30/05	STA-6 Section 2 converted to use as Cell 6B
Starting Date for Output	-	05/01/94	
Integration Steps Per Day	-	4	
Number of Iterations	-	0	
Output Averaging Interval	days	30	
Inflow Conc Scale Factor	-	1	
Rainfall P Conc	ppb	10	
Atmospheric P Load (Dry)	mg/m2-yr	20	

Simulation Type:	Uncertainty Analysis					
Output Variable	Mean	Lower CL	Upper CL	Diagnostics		
FWM Outflow C (ppb)	21.0	30.7	14.7	H20 Balance Error Mean & Max	0.0%	0.0%
GM Outflow C (ppb)	17.1	26.5	11.0	Mass Balance Error Mean & Max	0.0%	0.0%
Load Reduction %	89%	85%	93%	Iterations & Convergence	3	0.3%
Bypass Load (%)	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	4A	4B	5A	5B	6A	6B
Vegetation Type	-->	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3	EMG_3
Inflow Fraction	-	0.156		0.156		0.156		0.156		0.235		0.141	
Downstream Cell Number	-	2		4		6		8		10		12.00	
Surface Area	km2	3.38	4.94	3.38	4.94	4.61	3.71	4.61	3.71	6.92	5.56	2.22	5.26
Mean Width of Flow Path	km	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	2.34	2.34	2.50	2.39
Number of Tanks in Series	-	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Depth for Releases	cm												
Release 1 Series Name													
Release 2 Series Name													
Outflow Series Name													
Depth Series Name													
Outflow Control Depth	cm	40	60	40	60	40	60	40	60	40	60	60	60
Outflow Weir Depth	cm												
Outflow Coefficient - Exponent	-	4	4	4	4	4	4	4	4	4	4	4	4
Outflow Coefficient - Intercept	-	1	1	1	1	1	1	1	1	1	1	1	1
Bypass Depth	cm												
Maximum Inflow	hm3/day												
Maximum Outflow	hm3/day												
Inflow Seepage Rate	(cm/d) / cm												
Inflow Seepage Control Elev	cm												
Inflow Seepage Conc	ppb												
Outflow Seepage Rate	(cm/d) / cm	0.0075	0.0075										
Outflow Seepage Control Elev	cm	-46	-38										
Max Outflow Seepage Conc	ppb	20	20										
Seepage Recycle to Cell Number	-	1	2										
Seepage Recycle Fraction	-	1	1										
Seepage Discharge Fraction	-												
Initial Water Column Conc	ppb	30	30	30	30	30	30	30	30	30	30	30	30
Initial P Storage Per Unit Area	mg/m2	500	500	500	500	500	500	500	500	500	500	500	500
Initial Water Column Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200
C0 = Conc at 0 g/m2 P Storage	ppb	3	3	3	3	3	3	3	3	3	3	3	3
C1 = Conc at 1 g/m2 P storage	ppb	22	22	22	22	22	22	22	22	22	22	22	22
C2 = Conc at Half-Max Uptake	ppb	300	300	300	300	300	300	300	300	300	300	300	300
K = Net Settling Rate at Steady State	m/yr	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Z1 = Saturated Uptake Depth	cm	40	40	40	40	40	40	40	40	40	40	40	40
Z2 = Lower Penalty Depth	cm	100	100	100	100	100	100	100	100	100	100	100	100
Z3 = Upper Penalty Depth	cm	200	200	200	200	200	200	200	200	200	200	200	200

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

Table A.9 STA-6: Case "2010 Alt1"

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

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

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

Simulation Type: Uncertainty Analysis

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

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

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

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

Table A.10 STA-6: Case "2010 Alt1 SAV"

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

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

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

Simulation Type: Uncertainty Analysis

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

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

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

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

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