TECHNICAL WORKING GROUP MEETING NO. 5

Marathon Government Center
2796 Overseas Highway, Room 104

April 26, 2007 ❖ 9:30 am – 1:30 pm

Agenda

I. Welcome
II. Review of Consensus Items
III. Identified Management Activities and Reductions
IV. Sanctuary Advisory Council Presentation
V. Initial Draft of the Stakeholders Agreement
VI. FKRAD Document Overview
VII. Action Items
VIII. Next Meeting

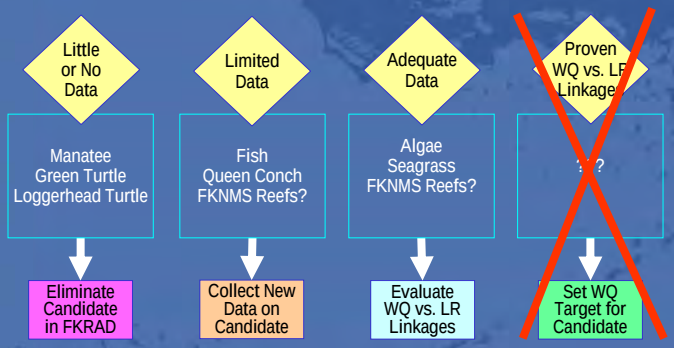
REVIEW OF CONSENSUS ITEMS

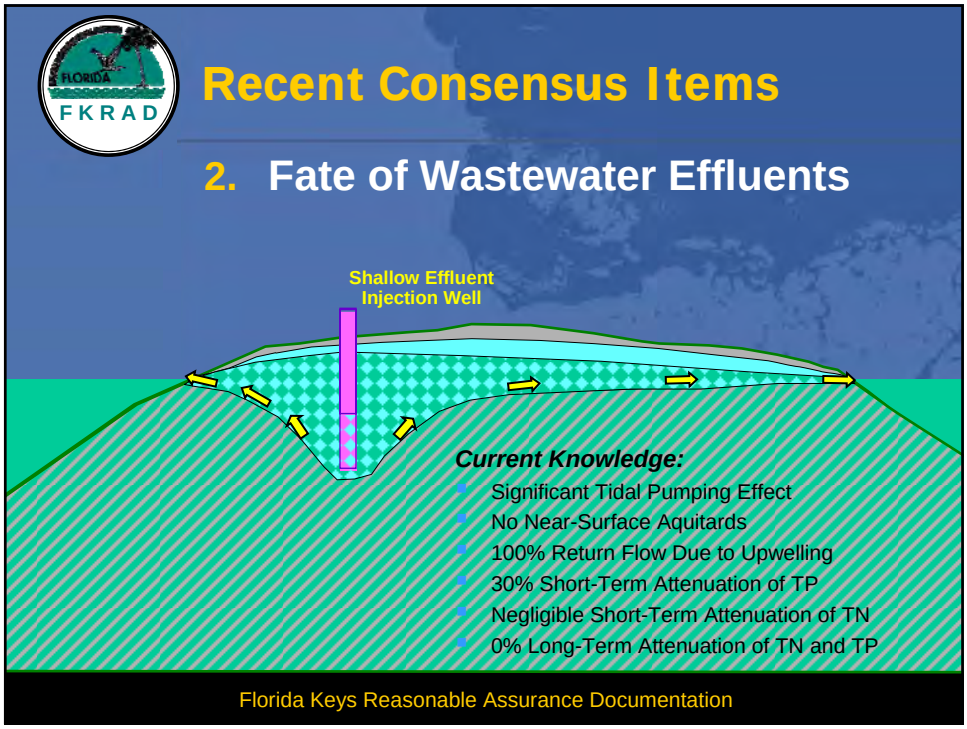
- Impairments
- Fate of Wastewater Effluent Disposal Flows
- Fate of Stormwater Runoff

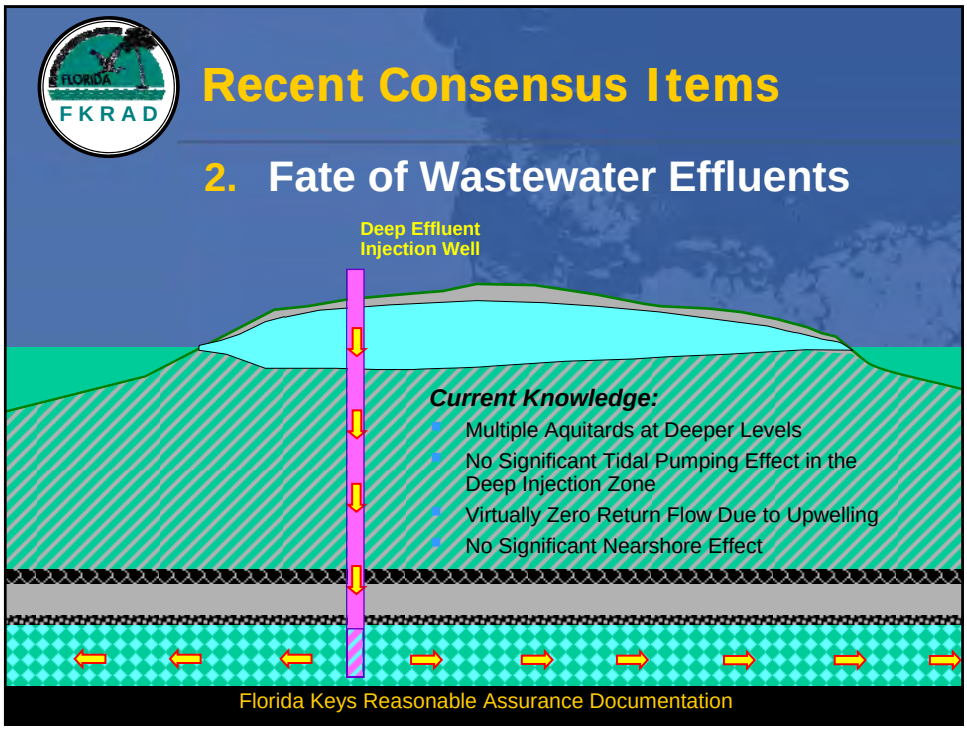
Scott McClelland
CDM

Recent Consensus Items

1. Water Quality Impairments

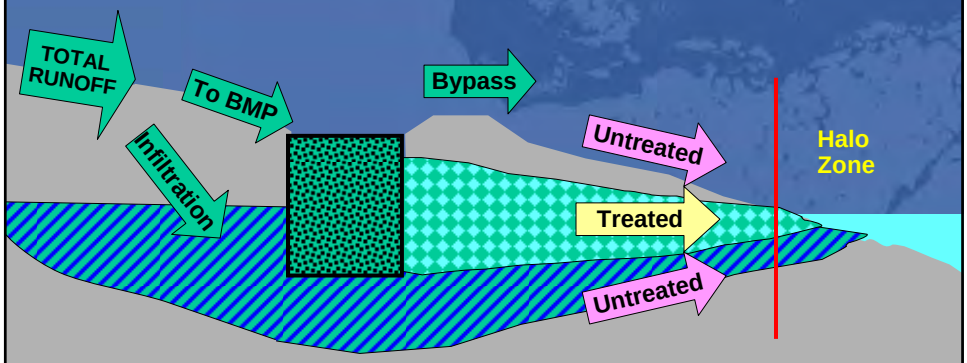



FLORIDA
FKRAD
Recent Consensus Items
2. Fate of Wastewater Effluents
Shallow Effluent Injection Well
Current Knowledge:
Significant Tidal Pumping Effect
No Near-Surface Aquitards
100% Return Flow Due to Upwelling
30% Short-Term Attenuation of TP
Negligible Short-Term Attenuation of TN
0% Long-Term Attenuation of TN and TP
Florida Keys Reasonable Assurance Documentation


FLORIDA
FKRAD
Recent Consensus Items
2. Fate of Wastewater Effluents
Deep Effluent Injection Well
Current Knowledge:
Multiple Aquitards at Deeper Levels
No Significant Tidal Pumping Effect in the Deep Injection Zone
Virtually Zero Return Flow Due to Upwelling
No Significant Nearshore Effect
Florida Keys Reasonable Assurance Documentation

Recent Consensus Items

3. Fate of Stormwater Runoff



BMP Treatment Calculation:

- Load Delivered = $[(Q_{BYPASS} + Q_{INF}) + Q_{BMP}\ (1\text{-}\%REM_{BMP})]\ (C_{COMPOSITE})(k)$
- Infiltrated Runoff and BMP Discharge Are Included

IDENTIFIED MANAGEMENT ACTIVITIES AND ESTIMATED NUTRIENT EDUCTIONS

- Wastewater Treatment
- Stormwater Management
- Status of WBID Models

Steve Lienhart
URS Corporation

Wastewater Treatment

Baseline = 1999

Baseline Wastewater Discharges

Stakeholder	EDUs	FLOW (MGD)	TN (lbs)	TP (lbs)
FDOT	0	0	0	0
FLORIDA STATE PARKS	922	0.13	8,223	2,324
ISLAMORADA	9,087	1.44	90,173	26,361
KEY COLONY BEACH	861	0.14	8,391	2,517
KEY WEST*	22,452	2.98	181,617	54,485
LAYTON	132	0.02	931	279
MARATHON	9,012	1.46	100,419	26,659
UNINCORPORATED COUNTY*	35,851	5.01	306,049	91,624
U.S. Navy	TBD	TBD	TBD	TBD
Grand Total	78,316	11.18	695,803	204,249

*Includes U.S. Navy Properties

Stormwater Management

Baseline = 1999

Baseline Stormwater Discharges

STAKEHOLDER	VOL (ac-ft)	TP (lb)	DP (lb)	TKN (lb)	NOX (lb)	TN (lb)
FDOT	TBD	TBD	TBD	TBD	TBD	TBD
FLORIDA STATE PARKS	73,229	43,241	23,407	189,100	85,774	274,873
ISLAMORADA	5,063	3,292	1,625	16,333	6,546	22,880
KEY COLONY BEACH	291	219	107	1,108	371	1,479
KEY WEST*	4,873	3,433	1,602	17,017	6,785	23,802
LAYTON	149	85	43	415	193	608
MARATHON	5,550	3,744	1,804	18,044	6,765	24,809
UNINCORPORATED*	49,708	28,951	15,994	122,693	56,648	179,342
U.S. NAVY	TBD	TBD	TBD	TBD	TBD	TBD
Grand Total	73,229	43,241	23,407	189,100	85,774	274,873

*Includes U.S. Navy Properties

Combined Baseline Discharges

Baseline = 1999

Combined Baseline Discharges

STAKEHOLDER	SW TP (lbs)	WW TP (lbs)	TOTAL TP (lbs)	SW TN (lbs)	WW TN (lbs)	TOTAL TN (lbs)
FDOT	TBD	TBD	TBD	TBD	TBD	TBD
FLORIDA STATE PARKS	3,516	2,324	5,840	21,954	8,223	30,177
ISLAMORADA	3,292	26,361	29,653	22,880	90,173	113,053
KEY COLONY BEACH	219	2,517	2,737	1,479	8,391	9,870
KEY WEST*	3,433	54,485	57,919	23,802	181,617	205,419
LAYTON	85	279	364	608	931	1,539
MARATHON	3,744	26,659	30,403	24,809	100,419	125,227
UNINCORPORATED*	28,951	91,624	120,575	179,342	306,049	485,391
U.S. NAVY	TBD	TBD	TBD	TBD	TBD	TBD
Grand Total	43,241	204,249	247,490	274,873	695,803	970,676

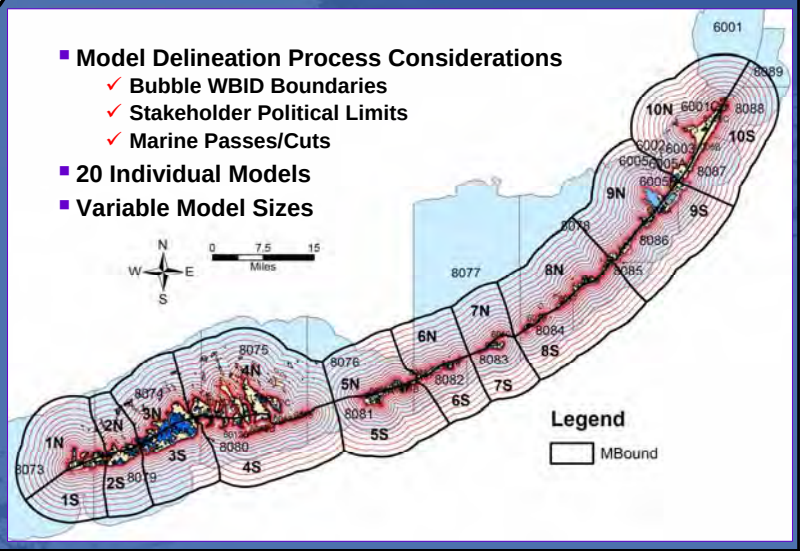
*Includes U.S. Navy Properties

Status of WBID Models

- Model Development
- Model Coverage
- Model Inputs
- Boundary Conditions
- Initial Simulation Results

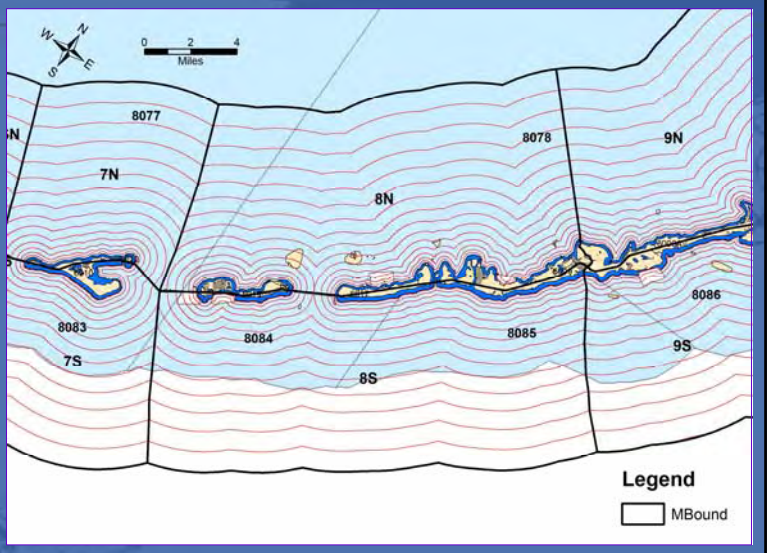
Coverage of WBID Models

- Model Delineation Process Considerations
  - ✓ Bubble WBID Boundaries
  - ✓ Stakeholder Political Limits
  - ✓ Marine Passes/Cuts
- 20 Individual Models
- Variable Model Sizes



Florida Keys Reasonable Assurance Documentation

Status of WBID Models



Florida Keys Reasonable Assurance Documentation

Status of WBID Models

Model Inputs – **Wastewater Flows**

STUDY_AREA	GPD_EDU
Cudjoe Key	110
Ocean Reef Club	112
Rock Harbor, PAED 16	115
Long Key/Layton	116
Bay Point	119
Tavernier, PAED 15	125
Big Pine Key	132
Key West	132
PAED 18	134
Little Torch Key	135
PAED 19 & 20	143
Ramrod Key	146
Boca Chica	149
Summerland Key	149

STUDY_AREA	GPD_EDU
Windley Key	150
Lower Matecumbe	151
PAED 17	155
Upper Sugarloaf	156
Plantation Key	158
Bahia Honda/Ohio Key	160
Marathon Primary	160
PAED 22	160
PAED 21	160
Upper Matecumbe	167
Stock Island	168
Marathon Secondary	172
Lower Sugarloaf	181
Big Torch/Middle Torch Key	200

Baseline = 1999

Status of WBID Models

Model Inputs – **Wastewater Treatment Methods and Effluent Discharge Characteristics**

WWT Method	BOD	TSS	TN	TP
Cesspool	180	180	30	6
Septic Tank/Drainfield	5	5	20	5
ATU/Drainfield	5	5	20	5
OWNRS	5	5	5	1
Secondary Treatment	20	20	20	5
Advance Secondary	5	5	10	1
Advanced Wastewater Treatment	5	5	3	1
BAT	10	10	10	1
IQ Part II	10	10	10	6
IQ Part III	5	5	10	6

Status of WBID Models

Model Inputs – **Regional Annual Rainfall**

RS_ID	R_STATION	SOURCE	REC_YRS	R_AVG	R_DRY	R_WET
RS-02	Key West	SFWMD	92	38.90	31.61	44.79
RS-04	Marathon	SFWMD	24	37.21	27.79	44.25
RS-06	Long Key	SFWMD	20	41.73	34.33	47.78
RS-07	Lignumvitae	EarthInfo	34	39.77	31.71	46.16
RS-09	Tavernier	SFWMD	63	44.11	32.25	52.79
RS-10	TPTS	SFWMD	9	46.60	33.62	55.99

Status of WBID Models

Model Inputs – **Stormwater Nutrient EMCs**

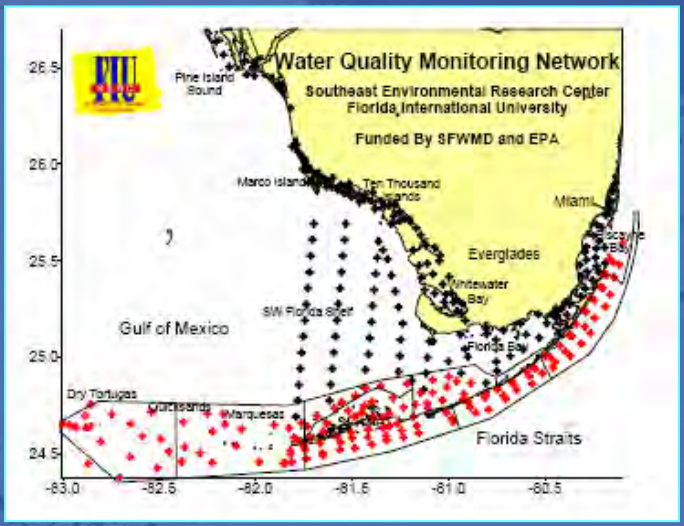
Land Use	LU_Code	DCIA	TP	DP	TKN	TN
Forest, Open, Park	VAC	0.5%	0.22	0.09	0.92	0.32
Agriculture, Golf Course	AGR	0.5%	0.34	0.23	1.74	0.58
Low Density Residential	LDR	10.0%	0.35	0.19	1.34	0.63
Medium Density Residential	MDR	30.0%	0.30	0.15	1.50	0.51
High Density Residential	HDR	50.0%	0.27	0.12	1.24	0.40
Commercial	COM	90.0%	0.21	0.09	1.36	0.46
Industrial	IND	70.0%	0.28	0.20	1.47	0.40
Urban Open	REC	0.5%	0.13	0.04	1.00	0.58
Waterbodies & Watercourses	WTR	25.0%	0.16	0.11	0.58	0.40
FDOT Roadways	HWY	90.0%	0.40	0.15	1.51	0.34
County Roadways	HWY	90.0%	0.40	0.15	1.51	0.34
Public Facilities [3]	INS	70.0%	0.20	0.08	1.24	1.05

Status of WBID Models

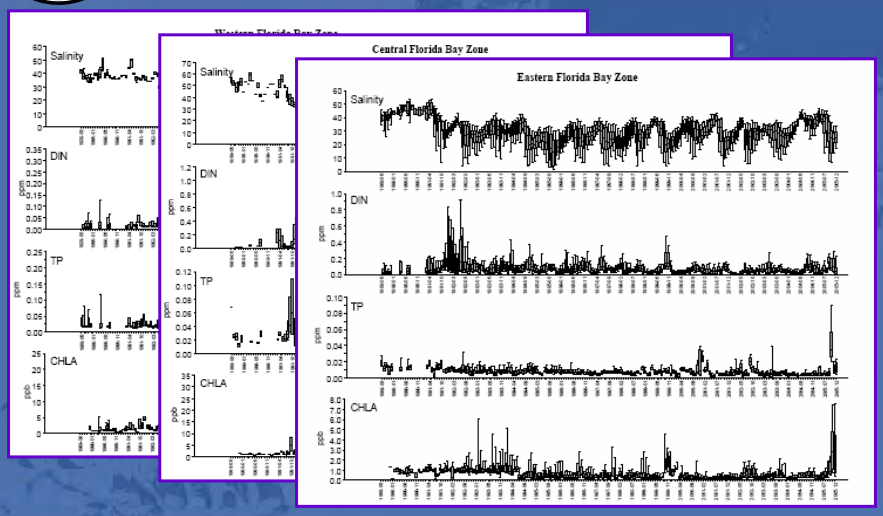
Model Inputs – **Stormwater Treatment BMPs**

	BMP_DESC	TP	TDP	NOX	TKN	TN
1	Extended Dry Detention	25%	0%	0%	15%	10%
2	Wet Detention	45%	65%	25%	35%	30%
3	Retention	95%	95%	95%	95%	95%
4	Swales	40%	15%	15%	30%	20%
5	Retention Swales with Wet Detention	80%	88%	76%	72%	74%
6	Bioretention	77%			74%	
7	Water Quality Inlets and Baffle Boxes	35%	0%	5%	0%	5%
8	Infiltration Drainfields	65%				83%
9	Modular Treatment System	90%				77%
10	Porous Pavement	65%				83%
11	Sand Filters	33%		0%	46%	21%
12	Stormwater Wetlands	49%				28%
13	Alum Treatment	90%				50%

Status of WBID Models



Zonal Water Quality



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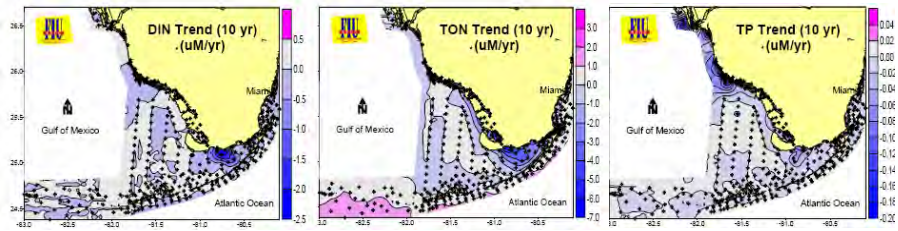
Kriged Water Quality Surfaces

1999-2004 Nutrient Concentrations



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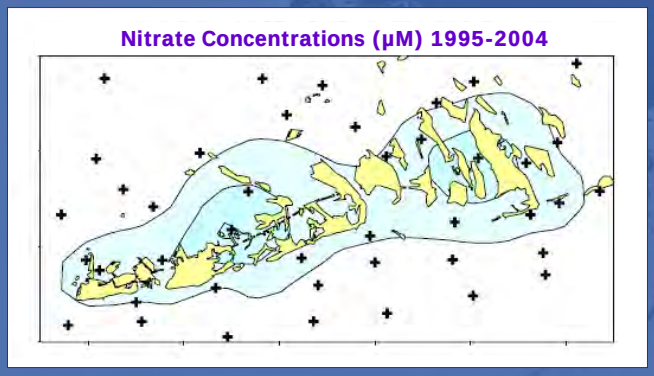
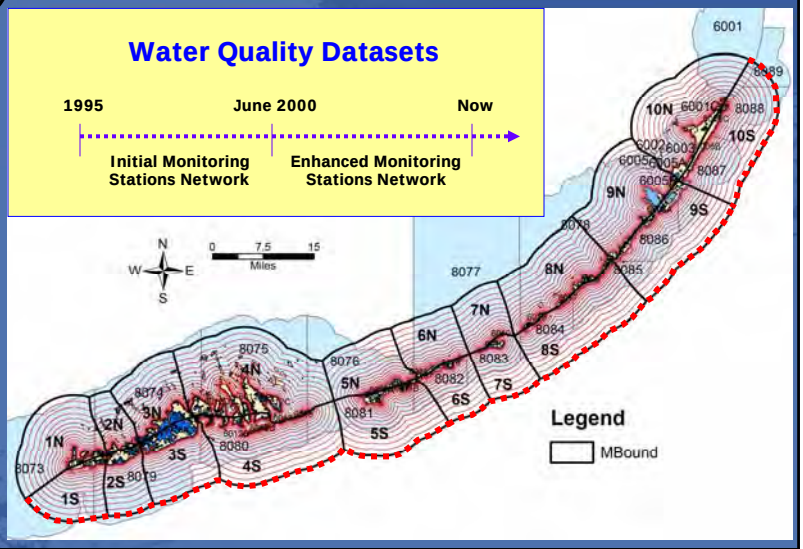
Boyer's Nitrate Observations



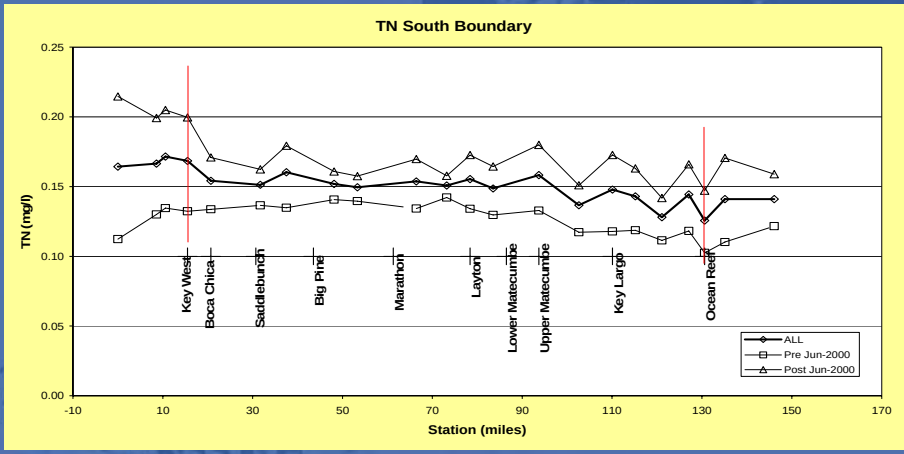
- Elevated nitrate levels are a regular feature of Backcountry waters
- Some of the highest concentrations are observed in non-populated areas
- Probably the result of benthic flux of nutrients in this very shallow water column

Status of WBID Models



Status of WBID Models

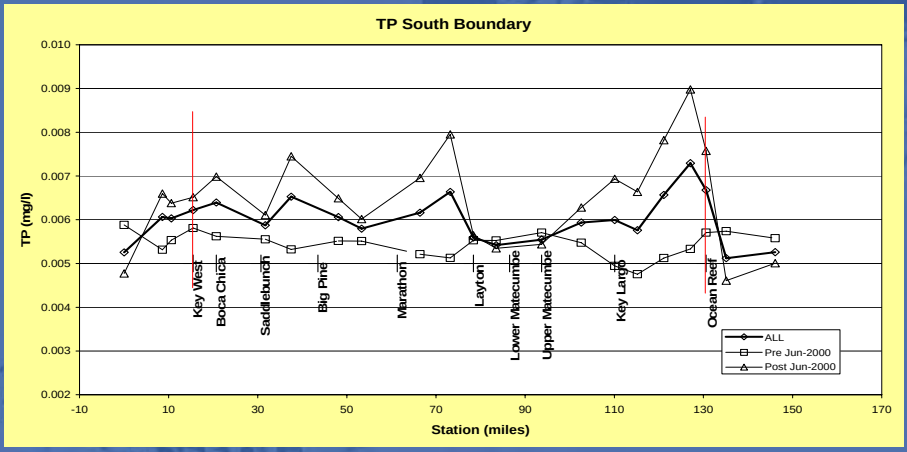
Model Inputs – **TN Boundary Condition**



Florida Keys Reasonable Assurance Documentation

Status of WBID Models

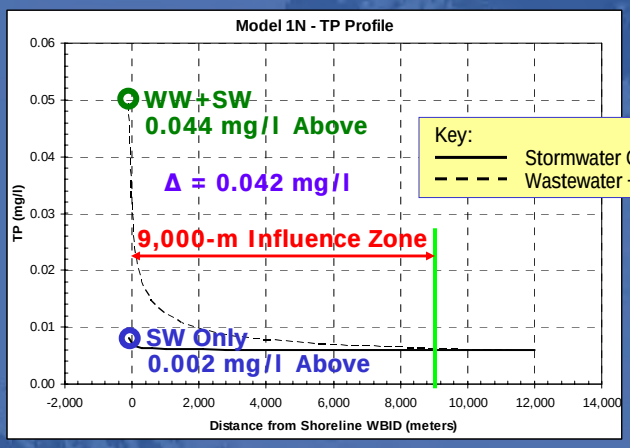
Model Inputs – **TP Boundary Condition**



Florida Keys Reasonable Assurance Documentation

Status of WBID Models

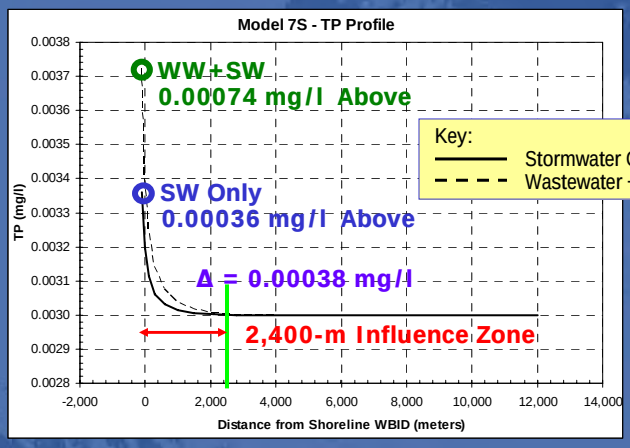
Model Output – **Simulated TP Profile**



Florida Keys Reasonable Assurance Documentation

Status of WBID Models

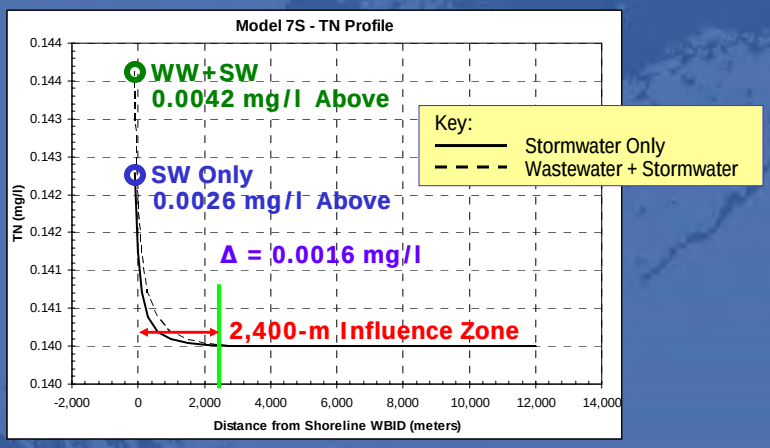
Model Output – **Simulated TP Profile**



Florida Keys Reasonable Assurance Documentation

Status of WBID Models

Model Output – **Simulated TN Profile**



SANCTUARY ADVISORY COMMITTEE PRESENTATION

- Overview of Presentation
- Committee Comments and Questions
- Required Change in Direction?

Scott McClelland
CDM

Overview of the Presentation

- Overview of TMDL Process
- Relationship to FKRAD
- FKRAD Process
  - Nutrients Only
  - Bubble WBID's
- Status of FKRAD
- Requested Help for Challenges

Issues/Challenges

- Funding
- Schedule
- WQ Targets & Associated Science
- Injection Well Upwelling
- Outside Influences
- Interaction Among Living Resources

Committee Comments and Questions

- Support Received from Sanctuary Advisory Council Staff
- Some Reservations of the Council
  - Concern over "Voluntary Nature"

Conclusion: **No Change in FKRAD Direction is Required**

INITIAL DRAFT OF THE STAKEHOLDER AGREEMENT

- Intent
- Form of the Agreement
- Initial Draft Document

Steve Lienhart
URS Corporation

Intent of the Agreement

- Identify Participants
  - Stakeholders/Implementers
  - Regulators, Programs, and Other Interests
- Define Management Activities
- Establish Responsibilities
  - What You Agree to Do In Your Community
- Identify Anticipated Benefits
- Confirm Participation

FKRAD Stakeholders Agreement

- Geographic Coverage
  - **Likely To Be Geographically Differentiated**
  - **May Be Multiple Agreements**
- No Centralized Management Entity
  - **Implementation by Individual Stakeholders**
  - **Local Progress Reporting by Individual Stakeholders**
  - **Integration of Progress Reports by FDEP**
- Key Details in the Agreement
  - **Specific Management Actions**
  - **Identification of Implementation Responsibilities**
  - **Quantitative Nutrient Reductions Expected by WBID**
  - **Comparative Nutrient Concentration Changes**
- Allow 3rd Party Endorsements

Geographic Scope

Many Possibilities

- Regional
  - All Keys
  - Upper – Middle – Lower Keys
  - Multiple Islands
  - Single Jurisdiction
  - Single Island
  - Single WBID
- Some Combination

- **Flexibility**
  Can Accommodate Any of the Options
- **EPA**
  - Questioned These Options
  - Ultimately Must Concur With Choice

Conclusion: **Strategy Not Finalized**

Stakeholders Agreement Structure

Background

I. Mission

II. Guiding Principles

III. Organization

IV. Education, Outreach, Implementation

V. Stakeholder Involvement and Commitments

VI. Measures of Success

Signatory Pages

Individual Stakeholder Commitments

- Specific Management Actions
- Specific Service Areas
- Investments
  - Land
  - Construction
  - Operations
- Schedule
- Reporting of Accomplishments

Let's Discuss

ACTION ITEMS

- Draft Stakeholder Summary Review Comments
- Working Schedules
- Draft Stakeholder Agreement Review Comments
- Technical Working Group Meetings

Scott McClelland
CDM

Current Status

	Comp Plan	Wastewater Master Plan	Stormwater Master Plan	Other Plans and Data	Implementation Schedule
FDOT	NA	NA	Waiting	Waiting	Waiting
Islamorada	✓	✓	✓	✓	Waiting
Key Colony Beach	✓	NR	✓	✓	✓
Key West	✓	NR	In Process	✓	✓
Layton	✓	In Process	None	NA	✓
Marathon	Waiting	Waiting	✓	Waiting	Waiting
Monroe County	✓	✓	✓	✓	Waiting
State Parks	NA	✓	✓	✓	✓
U.S. Navy	NA	Waiting	Waiting	Waiting	Waiting
FKAA	NA	✓	NA	Waiting	Waiting
KLWTD	NA	✓	NA	NA	✓

✓ = Obtained but may need clarification

Working Schedule

- Technical Working Group Meetings
  - Charter Meeting: October 24, 2006
  - Meeting 1: November 17, 2006
  - Meeting 2: December 13, 2006
  - Meeting 3: February 23, 2007
  - Meeting 4: March 23, 2007
  - Meeting 5: April 26, 2007
  - **Meeting 6: May 24, 2007**
  - Meeting 7: June 29, 2007
  - Meeting 8: July 26, 2007

Working Schedule

FKRAD Document

▪ Completion of One-on-One Interviews	February (Done)
▪ Delivery of Draft Stakeholder Summaries	March (Done)
▪ Completion of Initial Stakeholder Reviews	April (This Meeting)
▪ Finalization of Stakeholder Summaries	May (Next Meeting)
▪ Digital Release of Draft FKRAD Document	June/July
▪ Digital Release of Interim Document	July/August
▪ Digital Release of Final Document	September
▪ Distribution of Final Printed Document	September/October

Stakeholders Agreement

▪ Release of Initial Draft Agreement	April (This Meeting)
▪ Release of Interim Draft Agreement	June
▪ Distribution of Final Agreement	August
▪ Execution of the Final Agreement	September

Next Meeting

TWG Meeting Number 6

PROJECTED NUTRIENT CHANGES AND FINALIZED STAKEHOLDER SUMMARIES

May 24th ❖ 9:30AM – 1:30PM

Marathon Government Center
2796 Overseas Highway
Conference Room 104
Marathon, Florida

Questions?

Adaptive Management

Florida Keys Reasonable Assurance Documentation