

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

Case No. 88-1886-Civ-Moreno

UNITED STATES OF AMERICA,

Plaintiff,

v.

SOUTH FLORIDA WATER MANAGEMENT
DISTRICT, et al.

Defendants.

DECLARATION OF GARY GOFORTH, Ph.D., P.E.

I, Gary Goforth, declare as follows:

1. I have previously provided expert testimony in this proceeding in the areas of environmental engineering, water quality treatment, and constructed wetlands. A copy of my resume is attached.

2. For the past four years, since September 2004, phosphorus concentrations at the network of monitoring stations within the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) have not experienced an exceedance of the interim and long-term phosphorus levels as set forth in Appendix B to the Settlement Agreement in this case. A copy of the Technical Oversight Committee Compliance Tracking Table is attached as Figure 1.

3. Phosphorus concentrations have been in compliance with the interim and long-term discharge limits for inflows into Everglades National Park (Park), as set forth

EXHIBIT D

in Exhibit A to the Settlement Agreement, since they went into effect in October 2003 and December 2006, respectively.

4. Since 1996, farmers in the EAA have been in compliance with their Rule 40E-63, Fla. Admin. Code, permits that require a 25% long-term phosphorus load reduction.

5. Attached as Figure 2 are summaries depicting phosphorus concentrations and loads entering the Refuge and the Everglades Protection Area for the past two years. As indicated, STA-1W, which was damaged during the hurricanes of 2004 and 2005, and was partially off-line between 2005 and 2007 for repairs and to construct performance enhancements, has discharged for the past twelve months at a flow-weighted mean concentration of 45 parts per billion (ppb), which is below 50 ppb. STA-1E began discharging in September 2004 under an Emergency Order to minimize hurricane-induced flooding in upstream basins. STA-1E subsequently commenced routine flow through operations in September 2005 and discharged for the past twelve months at a flow-weighted mean concentration of 18 ppb.

6. Attached as Figure 3 are figures depicting the 12-month cumulative phosphorus inflow loads entering the Refuge from STA-1W and STA-1E, and the corresponding inflow phosphorus concentrations. Also included in Figure 3 is a depiction of the 12-month cumulative phosphorus loads and concentrations entering the Refuge. For the past 12 months, the cumulative phosphorus load entering the Refuge dropped to 12.0 metric tons, in part due to a regional drought. However, the 12-month flow-weighted average phosphorus concentration entering the Refuge was 31 ppb, well below 50 ppb, and a result of the improving performance of STA-1E and STA-1W.

7. Attached as Figure 4 are two figures depicting the relationship between the 12-month cumulative phosphorus loads entering the Refuge since 1994 and 1999 and the average phosphorus concentrations measured at the 14-station network described in Appendix B to the Settlement Agreement. As depicted in the post-1994 figure, despite significant load reductions resulting from the State's phosphorus control program, there has been no significant downward trend in phosphorus concentrations measured at the 14-station network.

8. In December 2006, the State completed construction of approximately 5,270 acres of additional stormwater treatment areas, the first phase of approximately 16,800 acres of STA expansion to the previously existing 39,700 acres.

9. In December 2006, the State completed construction of facilities that divert stormwater runoff from the Village of Wellington that previously discharged a long-term average of approximately 4.7 metric tons per year of phosphorus directly to the Refuge.

10. During the past water year (May 1, 2007 to April 30, 2008), the discharges from the State's stormwater treatment areas met the 85 percent and 80 percent phosphorus load reduction targets for the Refuge and Everglades Protection Area, respectively, as prescribed by the TOC-approved compliance methodology.

I declare, under penalty of perjury, that the foregoing is true and correct.

By: 

Gary Goforth, Ph.D., P.E.

Executed: 7/31/08

FIGURE 1. TOC COMPLIANCE TABLE

Refuge TP Compliance Table

File on May 16, 2008.

Yellow highlighted and bolded months' geomeans were higher than long term levels.
 Green highlighted and italicized months' levels were not applicable (N/A)
 because the average stages were less than 15.42 feet.

Note: May 2005 and June 2005 TP concentration data were qualified as questionable
 and should not be used. GM for those months are shown for reference only.

month-year	TP Geomean (ppb)	Long-Term Level (ppb)	Average Stage (feet)	TP Sample Data (n)	Stage Data (n)
Feb-1999	6.8	9.1	16.62	11	3
Mar-1999	9.1	11.6	16.14	9	3
<i>Apr-1999</i>	<i>11.9</i>	<i>N/A</i>	<i>15.35</i>	<i>3</i>	<i>3</i>
<i>May-1999</i>	<i>16.4</i>	<i>N/A</i>	<i>15.20</i>	<i>2</i>	<i>3</i>
Jun-1999	14.2	9.8	16.47	13	3
Jul-1999	11.1	11.8	16.11	10	3
Aug-1999	12.7	12.3	16.03	8	3
Sep-1999	10.3	8.4	16.79	14	3
Oct-1999	10.3	7.2	17.28	14	3
Nov-1999	9.0	7.2	17.25	14	3
Dec-1999	9.1	7.9	16.94	14	3
Jan-2000	8.1	8.9	16.67	14	3
Feb-2000	9.6	9.9	16.45	13	3
Mar-2000	10.6	12.1	16.08	12	3
Apr-2000	10.4	10.6	16.30	14	3
May-2000	11.0	12.2	16.05	14	3
<i>Jun-2000</i>	<i>12.4</i>	<i>N/A</i>	<i>15.31</i>	<i>6</i>	<i>3</i>
Jul-2000	10.8	13.7	15.83	6	3
Aug-2000	9.4	11.6	16.14	10	3
Sep-2000	10.2	11.1	16.22	11	3
Oct-2000	8.8	7.2	17.49	13	3
Nov-2000	7.5	7.6	17.01	14	3
Dec-2000	6.0	9.4	16.55	9	3
Jan-2001	7.2	11.7	16.13	8	3
Feb-2001	9.6	13.8	15.82	9	3
<i>Mar-2001</i>	<i>19.3</i>	<i>N/A</i>	<i>15.08</i>	<i>2</i>	<i>3</i>
Apr-2001	11.5	16.9	15.48	6	3
<i>May-2001</i>	<i>18.3</i>	<i>N/A</i>	<i>14.88</i>	<i>2</i>	<i>3</i>
<i>Jun-2001</i>	<i>15.1</i>	<i>N/A</i>	<i>15.42</i>	<i>9</i>	<i>3</i>
Jul-2001	11.4	13.8	15.82	11	3
Aug-2001	10.0	8.6	16.74	14	3
Sep-2001	9.6	9.3	16.57	14	3
Oct-2001	8.8	7.2	17.24	14	3
Nov-2001	7.4	7.2	17.46	14	3
Dec-2001	7.5	7.7	16.98	14	3
Jan-2002	6.4	8.8	16.69	14	3
Feb-2002	7.8	9.1	16.63	14	3
Mar-2002	7.3	9.7	16.50	14	3
Apr-2002	7.5	12.7	15.98	11	3
<i>May-2002</i>	<i>10.0</i>	<i>N/A</i>	<i>15.04</i>	<i>3</i>	<i>3</i>
Jun-2002	13.4	12.9	15.94	10	3
Jul-2002	11.2	8.3	16.82	14	3

Refuge Monthly Inflow Load Table

TP loads are calculated using "no ratio-adjustment" and "14 day maximum for auto sampler composite concentration" algorithm

Updated through December 31, 2007.

month-year	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Feb-1999	26	3.1	96
Mar-1999	1	0.1	43
<i>Apr-1999</i>	<i>27</i>	<i>1.5</i>	<i>44</i>
<i>May-1999</i>	<i>19</i>	<i>1.3</i>	<i>55</i>
Jun-1999	142	29.4	167
Jul-1999	38	6.4	137
Aug-1999	22	4.3	155
Sep-1999	91	19.5	173
Oct-1999	151	25.5	137
Nov-1999	45	6.0	108
Dec-1999	36	3.2	72
Jan-2000	35	3.7	86
Feb-2000	13	0.9	58
Mar-2000	33	4.3	106
Apr-2000	58	11.0	154
May-2000	25	2.5	82
<i>Jun-2000</i>	<i>9</i>	<i>0.7</i>	<i>68</i>
Jul-2000	56	6.5	94
Aug-2000	47	3.8	65
Sep-2000	63	8.7	112
Oct-2000	125	24.1	157
Nov-2000	2	0.1	37
Dec-2000	11	0.7	54
Jan-2001	3	0.1	39
Feb-2001	0	0.0	185
<i>Mar-2001</i>	<i>15</i>	<i>3.6</i>	<i>197</i>
Apr-2001	2	0.1	31
<i>May-2001</i>	<i>1</i>	<i>0.1</i>	<i>120</i>
<i>Jun-2001</i>	<i>5</i>	<i>0.6</i>	<i>105</i>
Jul-2001	53	4.9	74
Aug-2001	57	4.1	58
Sep-2001	66	3.5	43
Oct-2001	60	3.2	43
Nov-2001	16	1.2	60
Dec-2001	5	0.2	34
Jan-2002	13	0.3	19
Feb-2002	39	1.4	30
Mar-2002	1	0.1	63
Apr-2002	1	0.0	18
<i>May-2002</i>	<i>13</i>	<i>0.4</i>	<i>25</i>
Jun-2002	69	4.4	52
Jul-2002	79	4.8	50

FIGURE 1. TOC COMPLIANCE TABLE (CONTINUED)

Refuge TP Compliance Table

File on May 16, 2008.

Yellow highlighted and bolded months' geomeans were higher than long term levels.
 Green highlighted and italicized months' levels were not applicable (N/A)
 because the average stages were less than 15.42 feet.

Note: May 2005 and June 2005 TP concentration data were qualified as questionable
 and should not be used. GM for those months are shown for reference only.

month-year	TP Geomean (ppb)	Long-Term Level (ppb)	Average Stage (feet)	TP Sample Data (n)	Stage Data (n)
Aug-2002	9.0	11.1	16.22	12	3
Sep-2002	8.3	8.9	16.66	11	3
Oct-2002	7.5	9.0	16.64	12	3
Nov-2002	6.9	8.9	16.66	12	3
Dec-2002	5.9	7.9	16.93	14	3
Jan-2003	5.7	8.5	16.76	13	3
Feb-2003	7.5	9.5	16.54	11	3
Mar-2003	8.0	11.1	16.23	9	3
Apr-2003	7.6	11.2	16.20	12	3
May-2003	14.0	14.6	15.72	7	3
Jun-2003	7.9	12.1	16.06	11	3
Jul-2003	7.7	12.3	16.02	9	3
Aug-2003	8.0	8.6	16.74	14	3
Sep-2003	8.8	7.2	17.23	13	3
Oct-2003	7.0	7.2	17.15	14	3
Nov-2003	7.5	7.7	16.98	11	3
Dec-2003	7.6	8.0	16.91	14	3
Jan-2004	7.4	8.7	16.71	14	3
Feb-2004	8.2	8.7	16.71	14	3
Mar-2004	9.0	9.8	16.46	14	3
Apr-2004	9.6	13.1	15.91	9	3
May-2004	<i>12.4</i>	<i>N/A</i>	<i>15.37</i>	<i>9</i>	<i>3</i>
Jun-2004	<i>40.0</i>	<i>N/A</i>	<i>15.22</i>	<i>2</i>	<i>3</i>
Jul-2004	<i>21.0</i>	<i>N/A</i>	<i>15.00</i>	<i>1</i>	<i>3</i>
Aug-2004	17.5	12.5	16.00	12	3
Sep-2004	8.5	8.4	16.79	14	3
Oct-2004	8.9	8.5	16.76	13	3
Nov-2004	8.3	9.0	16.65	14	3
Dec-2004	10.4	10.3	16.37	13	3
Jan-2005	7.9	11.4	16.17	12	3
Feb-2005	9.4	12.3	16.03	11	3
Mar-2005	13.4	13.4	15.88	11	3
Apr-2005	8.6	11.4	16.17	11	3
May-2005*	26.8	14.1	15.78	10	3
Jun-2005*	18.1	11.4	16.17	14	3
Jul-2005	7.4	12.1	16.05	14	3
Aug-2005	6.5	11.4	16.17	12	3
Sep-2005	7.5	10.8	16.28	11	3
Oct-2005	6.5	9.6	16.52	13	3
Nov-2005	7.8	8.4	16.79	14	3
Dec-2005	7.6	8.2	16.85	14	3
Jan-2006	6.3	9.7	16.49	13	3

Refuge Monthly Inflow Load Table

TP loads are calculated using "no ratio-adjustment"
 and "14 day maximum for auto sampler composite
 concentration" algorithm

Updated through December 31, 2007.

month-year	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Aug-2002	70	3.3	38
Sep-2002	76	4.5	48
Oct-2002	79	4.5	46
Nov-2002	34	2.3	54
Dec-2002	77	6.6	70
Jan-2003	63	5.3	68
Feb-2003	25	4.4	144
Mar-2003	27	2.7	79
Apr-2003	13	1.2	77
May-2003	23	2.5	88
Jun-2003	48	2.7	45
Jul-2003	18	1.0	43
Aug-2003	124	9.8	64
Sep-2003	34	2.9	70
Oct-2003	13	0.9	57
Nov-2003	17	1.1	53
Dec-2003	10	0.5	43
Jan-2004	5	0.2	28
Feb-2004	24	1.0	34
Mar-2004	25	0.8	25
Apr-2004	1	0.0	36
May-2004	<i>6</i>	<i>0.2</i>	<i>33</i>
Jun-2004	<i>21</i>	<i>0.8</i>	<i>32</i>
Jul-2004	<i>23</i>	<i>1.5</i>	<i>52</i>
Aug-2004	92	4.9	43
Sep-2004	188	44.6	192
Oct-2004	89	22.6	207
Nov-2004	3	0.4	106
Dec-2004	11	1.2	84
Jan-2005	14	2.1	120
Feb-2005	5	0.5	96
Mar-2005	40	7.7	155
Apr-2005	2	0.1	49
May-2005*	9	2.0	172
Jun-2005*	79	15.7	160
Jul-2005	23	2.9	104
Aug-2005	13	1.2	77
Sep-2005	16	1.6	82
Oct-2005	47	7.2	125
Nov-2005	28	5.4	156
Dec-2005	2	0.2	91
Jan-2006	2	0.2	106

FIGURE 1. TOC COMPLIANCE TABLE (CONCLUDED)

Refuge TP Compliance Table

File on May 16, 2008.

Yellow highlighted and bolded months' geomeans were higher than long term levels.

Green highlighted and italicized months' levels were not applicable (N/A)

because the average stages were less than 15.42 feet.

Note: May 2005 and June 2005 TP concentration data were qualified as questionable and should not be used. GM for those months are shown for reference only.

month-year	TP Geomean (ppb)	Long-Term Level (ppb)	Average Stage (feet)	TP Sample Data (n)	Stage Data (n)
Feb-2006	6.4	9.8	16.48	13	3
Mar-2006	8.1	10.8	16.28	12	3
Apr-2006	8.4	12.2	16.05	12	3
May-2006	8.8	15.9	15.58	10	3
Jun-2006	9.9	16.5	15.51	5	3
Jul-2006	11.7	13.0	15.92	9	3
Aug-2006	9.0	11.1	16.22	11	3
Sep-2006	8.2	7.8	16.96	14	3
Oct-2006	7.5	8.6	16.74	14	3
Nov-2006	7.4	9.4	16.56	14	3
Dec-2006	5.6	11.0	16.23	11	3
Jan-2007	6.9	9.3	16.57	14	3
Feb-2007	6.2	10.4	16.34	13	3
Mar-2007	7.3	11.8	16.10	10	3
<i>Apr-2007</i>	<i>8.0</i>	<i>N/A</i>	<i>15.30</i>	<i>3</i>	<i>3</i>
<i>May-2007</i>	<i>no data</i>	<i>N/A</i>	<i>14.68</i>	<i>0</i>	<i>3</i>
<i>Jun-2007</i>	<i>13.6</i>	<i>N/A</i>	<i>15.37</i>	<i>4</i>	<i>3</i>
Jul-2007	10.4	13.5	15.86	13	3
Aug-2007	10.1	10.5	16.33	13	3
Sep-2007	8.5	9.2	16.59	14	3
Oct-2007	8.4	7.2	17.26	14	3
Nov-2007	7.0	7.2	17.19	14	3
Dec-2007	7.9	8.2	16.84	14	3
Jan-2008	6.2	8.9	16.68	13	3
Feb-2008	7.6	9.4	16.55	14	3
Mar-2008	6.7	9.4	16.54	14	3
Apr-2008*	5.8	10.3	16.36	14	3

* April 2008 stage and TP concentration data are preliminary values.

Refuge Monthly Inflow Load Table

TP loads are calculated using "no ratio-adjustment" and "14 day maximum for auto sampler composite concentration" algorithm

Updated through December 31, 2007.

month-year	Inflow (kac-ft)	TP loads (metric tons)	Inflow FWMC (ppb)
Feb-2006	29	6.9	192
Mar-2006	4	0.4	85
Apr-2006	0	0.0	69
May-2006	8	0.9	93
Jun-2006	10	1.3	113
Jul-2006	61	8.0	107
Aug-2006	66	7.0	86
Sep-2006	76	11.5	123
Oct-2006	3	0.3	93
Nov-2006	4	0.4	83
Dec-2006	17	1.5	74
Jan-2007	4	0.2	34
Feb-2007	1	0.0	31
Mar-2007	1	0.0	43
<i>Apr-2007</i>	<i>0</i>	<i>0.0</i>	<i>53</i>
<i>May-2007</i>	<i>0</i>	<i>0.0</i>	<i>80</i>
<i>Jun-2007</i>	<i>1</i>	<i>0.0</i>	<i>31</i>
Jul-2007	15	0.5	25
Aug-2007	35	2.0	46
Sep-2007	45	2.2	40
Oct-2007	64	3.1	39
Nov-2007	8	0.3	28
Dec-2007	5	0.2	32

FIGURE 2.

12-month Cumulative Flows and TP Loads to the WCAs Through July 27, 2008 – Preliminary Data Subject to Revision

Source	August 1, 2007 Through July 27, 2008					
	All Sources			From the EAA (including diversions)		
	Flow, AF	Load, mtons	Conc, ppb	Flow, AF	Load, mtons	Conc, ppb
STA-1E	162,570	3.667	18	43,894	0.990	18
STA-1W	149,455	8.372	45	149,455	8.372	45
To WCA-1	312,025	12.039	31.3	193,349	9.362	39.3
STA-2	274,321	6.824	20	274,321	6.824	20
STA-3/4	392,856	8.382	17	392,856	8.382	17
STA-6	2,716	0.141	42	2,716	0.141	42
To all WCAs	1,293,943	39.424	24.7	1,056,590	34.070	26.1

12-month Cumulative Flows and TP Loads to the WCAs For WY2008 (May 1, 2007 – April 30, 2008) – Preliminary Data Subject to Revision

Source	WY2008 (May 1, 2007 - April 30, 2008)					
	All Sources			From the EAA (including diversions)		
	Flow, AF	Load, mtons	Conc, ppb	Flow, AF	Load, mtons	Conc, ppb
STA-1E	125,391	3.138	20	9,474	0.237	20
STA-1W	117,002	7.611	53	94,258	6.132	53
To WCA-1	242,393	10.749	36.0	103,732	6.369	49.8
STA-2	227,003	6.085	22	226,481	6.071	22
STA-3/4	302,148	7.707	21	296,363	7.329	20
STA-6	2,458	0.117	39	2,458	0.117	39
To all WCAs	1,016,395	35.407	28.2	732,766	26.255	29.0

TP Loads from the EAA to the WCAs for WY2007 (May 1, 2006 – April 30, 2007)

Water Year 2007 May 1, 2006 - April 2007	Flow AF	Phosphorus	
		Load (mtons)	FWMC (ppb)
From EAA to WCA-1	140,777	18.342	106
from EAA to WCA-2	393,062	12.841	26
From EAA to WCA-3	167,326	4.303	21
Total from EAA to WCAs	701,166	35.486	41

FIGURE 3.

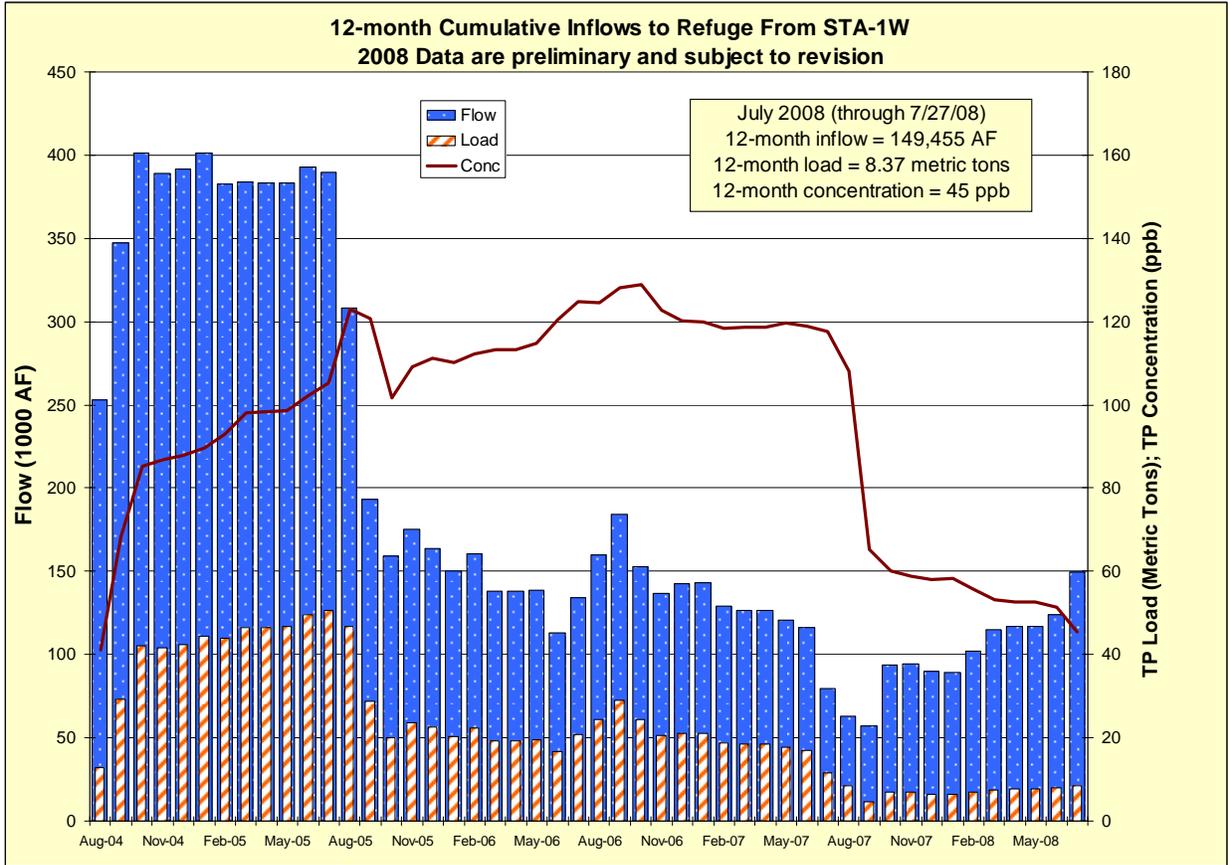


FIGURE 3. (CONTINUED)

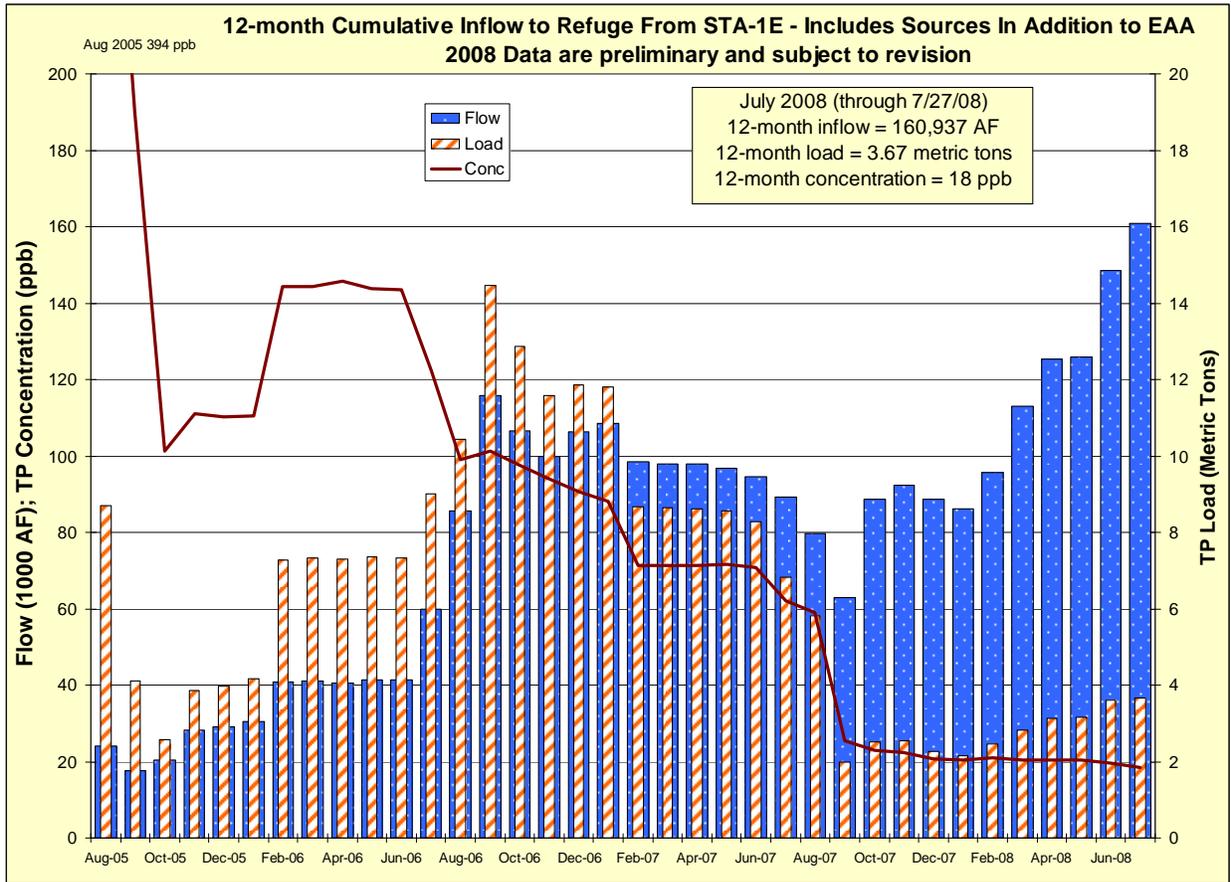


FIGURE 3 (CONCLUDED).

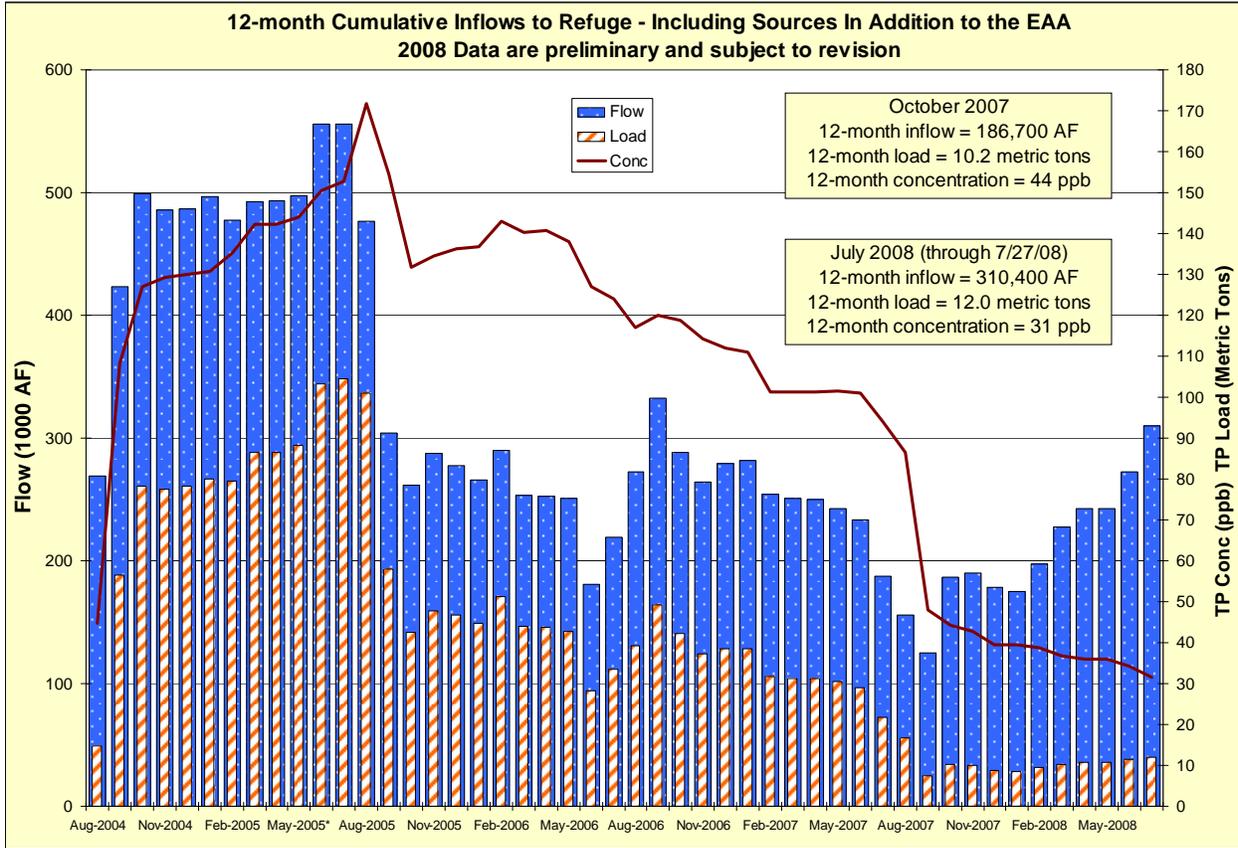
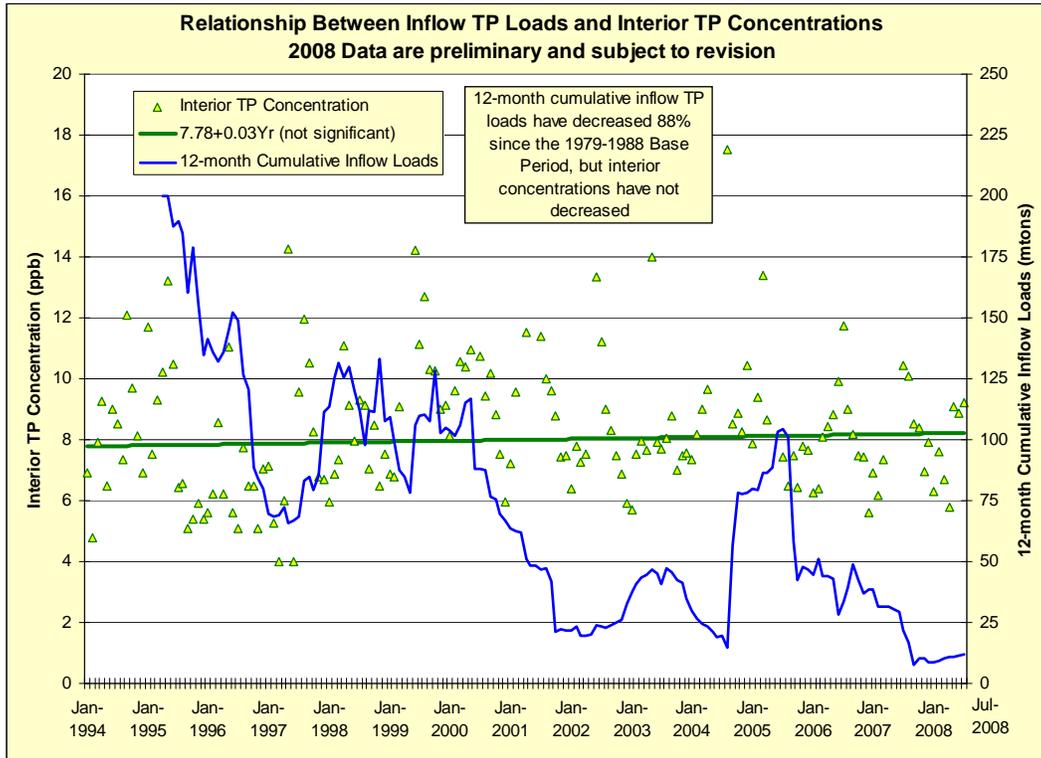


FIGURE 4.





Gary Goforth, Inc.
10924 S.W. Hawkview Circle
Stuart, Florida 34997

Voice/Fax (772) 223-8593
Cell (772) 631-1025
gary@garygoforth.net

SUMMARY Gary Goforth, P.E., Ph.D. has more than 25 years of experience in water resources engineering, encompassing strategic planning, design, permitting, construction, operation and program management. For the last 19 years, his focus has been on large-scale environmental restoration programs in the Kissimmee-Okeechobee-Everglades ecosystem. He was the Chief Consulting Engineer during the design, construction and operation of the \$700 million Everglades Construction Project, containing over 41,000 acres of constructed wetlands. He is experienced in water quality treatment design and evaluation, engineering design and peer review, systems ecology, statistical hydrology, hydrologic and hydrodynamic modeling, environmental permit acquisition and administration, and public education.

PROFESSIONAL EXPERIENCE

Presently President and Principal Engineer, Gary Goforth, Inc.

1/97-12/2004 CHIEF CONSULTING ENGINEER, South Florida Water Management District (SFWMD). Responsible for strategic planning, design review, development of operational plans, and program management of Everglades restoration projects. Provided factual and expert witness testimony in State and Federal courts.

4/94-12/96 DIRECTOR, Everglades Program Management Division, Ecosystem Restoration Department, SFWMD. Developed and implemented a management system for over 50 projects comprising the Everglades Program, estimated value of approximately \$800 million. Responsible for state and federal coordination of Everglades Program implementation, including acquisition and administration of environmental permits.

12/88 - 4/94 DIRECTOR, Project Management Division, Construction Management Department, South Florida Water Management District. Responsible for coordinating the planning, engineering design, permitting and construction of capital facilities.

8/86 - 12/88 SR. WATER RESOURCES ENGINEER, Resource Operations Dept., South Florida Water Management District. Developed a functional prototype of a decision support system to aid in the operation of the agency's 250 major water control facilities.

12/83 - 7/86 RESEARCH ENGINEER, Dept. of Environmental Engineering Sciences, University of Florida. Evaluated the technical feasibility of using a large-scale centrifuge to investigate the movement of hazardous waste through soil. Appointment included assignment at the U.S. Army Engineer Waterways



GARY F. GOFORTH, P.E., Ph.D.

www.garygoforth.net

Experiment Station; provided engineering support in the design of dredged material containment areas.

6/81 - 11/83 WATER RESOURCES ENGINEER, Espey, Huston and Assoc., Inc., Austin, Texas. Participated in numerous water resources projects, including hydrologic modeling in support of stormwater management systems for lignite mines, numerous water quality studies and hydrodynamic modeling of thermal discharges on estuaries.

1/80 - 5/81 GRADUATE RESEARCH ASSISTANT, Dept. of Environmental Engineering Sciences, University of Florida. Conducted field sampling and analyzed the impacts of thermal discharges from a nuclear power plant on marsh productivity.

2/77 - 12/79 RESEARCH ASSISTANT, Dept. of Environmental Engineering Sciences, University of Florida. Conducted field sampling to determine the nutrient dynamics in a freshwater marsh receiving secondary waste effluent.

LEGAL TESTIMONY

1995 – 2006 Federal court, qualified as an expert in environmental engineering, water quality treatment and constructed wetlands

1996 State land condemnation hearing; qualified as fact witness in environmental permitting

1997 State of Florida administrative hearing; qualified as an expert in environmental engineering, water quality treatment and constructed wetlands

2003 State of Florida; factual testimony to the Environmental Regulation Commission during hearings to develop a Phosphorus Water Quality Standard for the Everglades

EDUCATION

Ph.D. May 1986, Environmental Engineering Sciences, University of Florida, Gainesville, Florida; Dissertation: "Technical Feasibility of Centrifugal Techniques for Evaluation of Hazardous Waste Migration." Course work focused on soil physics, surfactant chemistry, groundwater hydrology and physical and computer modeling.

M.E. June 1981, Environmental Engineering Sciences, University of Florida, Gainesville, Florida. Thesis: "Long-Term Performance of Stormwater Detention Facilities: A Comparison of Design Methodologies." Course work focused on applied and statistical hydrology, surface water hydraulics, operations research, and systems ecology.

B.S.E. December 1979, Environmental Engineering Sciences, University of Florida, Gainesville, Florida. Course work focused on comprehensive environmental engineering curriculum.



PROFESSIONAL REGISTRATION

Registered Professional Engineer – Florida, No. 35525
Certificate of Authorization – Florida, No. 26236

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers

PUBLICATIONS – Proceedings, Peer-reviewed Reports and Refereed Journal Articles

Goforth, G., J. Heaney and W. Huber, 1981, "A Comparison of Design Methodologies for Stormwater Detention Facilities," Proceedings ASCE National Convention, St. Louis, Missouri.

Goforth, G., 1983, "An Advancement in Hydraulic Modeling of Porous Pavement Facilities," in Proceedings of Conference and Water Quality Model User Group Meeting, January, 1983.

Goforth, G., J. Heaney and W. Huber, 1983, "Comparison of Basin Performance Modeling Techniques," ASCE, Journal of Environmental Engineering, Vol. 109, No. 5, October 1983, pp. 1082 - 1098.

Goforth, G., 1984, "Evapoconsolidation in Fine-grained Material," in Proceedings, ASCE Waterway, Port, Coastal and Ocean Division, Specialty Conference on Dredging, Clearwater, Florida.

Goforth, G. 1987, "OASIS - The South Florida Water Management Advisor," presented at the Spring 1987 Conference of the American Geophysical Union, Baltimore Md.

Goforth, G., 1987, "OASIS: Florida's water management expert system," in AI Week, Applied Artificial Intelligence Reporter, November 1, 1987.

Goforth, G., "OASIS - The South Florida Water Management Advisor," Proceedings of the First Florida Artificial Intelligence Research Symposium, May 4-6, 1988.

Series of Articles Presented at the 1988 ASCE Water Resources Planning and Management Conference, Norfolk, Va., June 2, 1988:

"An Operations Advisor for Regional Water Management", with T. MacVicar.

"Design of the OASIS Advisory System," Goforth, G. F.

"What I Thought You Said When I Asked You What You Thought," with R. E. Slyfield.

"Knowledge Representation Within OASIS," Goforth, G. F.

"The OASIS Prototype," Goforth, G. F.

Goforth, G. F., 1988, "Advisory System for South Florida Water Management," proceedings of the 3rd Water Resources Operations Management Workshop, Ft. Collins, Colorado, June 1988.



- Goforth, G. F., J. S. Tongue, 1989, "OASIS - The South Florida Water Management Advisor," presented by J. Tongue at the 5th International Conference on Interactive & Processing Systems for Meteorology, Oceanography and Hydrology, January 1989, Anaheim, California.
- Floris, V., G. F. Goforth, 1990, "Planning the Development of the OASIS Advisory System," proceedings 17th Annual Water Resources Planning and Management Specialty Conf., ASCE.
- Goforth, G. F., and V. Floris, 1991, "OASIS: An Intelligent Water Management System for South Florida," in AI Applications, Vol. 5, No. 1, 1991, pp. 47-55.
- Goforth, G., F. Townsend and D. Bloomquist, 1991, "Saturated and unsaturated flow in a centrifuge," Proceedings of Centrifuge 1991, A. A. Balkema, pp. 497-502.
- Goforth, G., J. B. Jackson, L. Fink, 1994, "Restoring the Everglades," Civil Engineering.
- Guardo, M., L. Fink, T.D. Fontaine, S. Newman, M. J. Chimney, R. Bearzotti, and G. Goforth, 1995, Large-Scale Constructed Wetlands for Nutrient Removal from Stormwater Runoff: An Everglades Restoration Project. Environmental Mgmt. Vol. 19, No. 6, pp. 879-889.
- Redfield G., Chimney M., Goforth G. and Rizzardi K., 1999, Major Findings and Preliminary Implications, in *Everglades Interim Report*.
- Goforth G., 1999, Integrated Strategy to Achieve Water Quality Goals by 2006, Chapter 12 in *Everglades Interim Report*.
- Chimney M. and Goforth G., 2000, Environmental impacts to the Everglades ecosystem: A historical perspective and restoration strategies. In: *Proceedings 7th International Conference on Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, Florida, pp. 159-168.
- Goforth G., 2000, Surmounting the engineering challenges of Everglades restoration, In: *Proceedings 7th International Conference on Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, Florida, pp. 697-705.
- Goforth G. and Piccone T., Baseline Data Sets for the Basin-Specific Feasibility Studies, May 2000.
- Redfield G., Chimney M., Goforth G. and Rizzardi K., 2000, Introduction to the 2000 Everglades Consolidated Report, Chapter 1 in *2000 Everglades Consolidated Report*.
- Chimney M., Nungesser M., Newman J., Pietro K., Germain G., Lynch T., Goforth G., Moustafa Z., 2000, Stormwater Treatment Areas – Status of Research and Monitoring to Optimize



Effectiveness of Nutrient Removal and Annual Report on Operational Compliance, Chapter 6 in *2000 Everglades Consolidated Report*.

Redfield G., Chimney M., Goforth G. and Rizzardi K., 2000, Major Findings and Preliminary Implications of the 2000 Everglades Consolidated Report, Chapter 15 in *2000 Everglades Consolidated Report*.

Redfield G., Goforth G. and Rizzardi K., 2001, Introduction to the 2001 Everglades Consolidated Report, Chapter 1 in *2001 Everglades Consolidated Report*.

Goforth G. and Piccone T., Updated Baseline Data Sets for the Basin-Specific Feasibility Studies, May 2001.

Redfield G., Goforth G. and Rizzardi K., 2002, Introduction to the 2002 Everglades Consolidated Report, Chapter 1 in *2002 Everglades Consolidated Report*.

Goforth G., Bechtel T., Germain G., Rumbold D., Fink L., Bearzotti R., Iricanin N., Meeker R., 2002, STA Performance and Compliance, Chapter 4A in *2002 Everglades Consolidated Report*.

Goforth G., 2002, Achieving Long-Term Water Quality Goals, Chapter 8A in *2002 Everglades Consolidated Report*.

Goforth, G., 2002, Foundation For Success: The Everglades Construction Project, in proceedings Watershed 2002.

Goforth, G. and T. Piccone, 2002, Evaluation Methodology for Water Quality Improvement Strategies for the Everglades.

Redfield G., Burns K. and Goforth G., 2003, Introduction to the 2003 Everglades Consolidated Report, Chapter 1 in *2003 Everglades Consolidated Report*.

Goforth G., Bechtel T., Germain G., Rumbold D., Fink L., Bearzotti R., Iricanin N., Larson N., Meeker R., 2003, STA Performance and Compliance, Chapter 4A in *2003 Everglades Consolidated Report*.

Goforth G., Piccone T., Van Horn S., Pescatore D., Mo C., 2003, Achieving Long-Term Water Quality Goals, Chapter 8A in *2003 Everglades Consolidated Report*.

Redfield G., Goforth G. and Burns K., 2004, Introduction to the 2004 Everglades Consolidated Report, Chapter 1 in *2004 Everglades Consolidated Report*.

Goforth G., Pietro K., Germain G., Iricanin N., Fink L., Rumbold D., Bearzotti R., 2004, STA Performance and Compliance, Chapter 4A in *2004 Everglades Consolidated Report*.



- Piccone T., Goforth G., Van Horn S., Pescatore D., Germain G., 2004, Achieving Long-Term Water Quality Goals, Chapter 8A in *2004 Everglades Consolidated Report*.
- Abteu W., G. Goforth, and G. Germain, 2004, Stormwater Treatment Areas: Constructed Wetlands for Phosphorus Removal in South Florida Surface Waters, Proceedings of the 2004 World Water and Environmental Resources Congress, June 27 – July 1, 2004.
- Goforth G., Cypress Trees: Demonstrating the Utility of Swamps, in *Ecological Modeling*, Volume 178, Issues 1-2, Pages 1-292 (15 October 2004); Through the MACROSCOPE: the legacy of H. T. Odum.
- Redfield G., K. Burns and G. Goforth, 2005, Introduction to the 2005 South Florida Environmental Report - Volume I, Chapter 1 in *2005 South Florida Environmental Report*.
- Payne G., K. Weaver, G. Goforth, and T. Piccone, 2005, Status of Phosphorus and Nitrogen in the Everglades Protection Area, Chapter 2C in *2005 South Florida Environmental Report*.
- Goforth G., Pietro K., M. Chimney, J. Newman, T. Bechtel, G. Germain, and N. Iricanin, 2005, STA Performance, Compliance and Optimization, Chapter 4 in *2005 South Florida Env. Report*.
- Piccone T., and G. Goforth, 2005, Implementation of the Long-Term Plan for Achieving Water Quality Goals in the Everglades Protection Area, Chapter 8 in *2005 South Florida Environmental Report*.
- Chimney M. and Goforth G. 2006. History and Description of the Everglades Nutrient Removal Project, a Subtropical Constructed Wetland in South Florida (USA), *Ecological Engineering* (2006) 268-278, Elsevier Press.
- Redfield, G., S. Efron, G. Goforth, R. T. James, S. Van Horn, C. Adorisio, B. Jones, T. Piccone, K. Pietro and J. Zhang, 2007, An Integrative Perspective on Regional Water Quality and Phosphorus Chapter 1B in *2007 South Florida Environmental Report*.
- Pietro, K., R. Bearzotti, M. Chimney, G. Germain, N. Iricanin and T. Piccone; Contributors: W. Abteu, V. Ciuca, C. Combs, G. Goforth, T. Griffin, G. Hwa, M. Imru, D. Johnson, E. Fogarty-Kellis, R. S. Huebner, M. Korvela, J. Galloway, N. Jimenez, T. Kosier, N. Larson, R. Mierau, J. Newman, K. Snell, D. Thayer, L. Toth, C. Wilson and S. Xue, 2007, STA Performance, Compliance and Optimization, Ch 5 in *2007 South Florida Environmental Report*.



TECHNICAL REPORTS

- Goforth, G., 1979 Annual Report to Florida Power Corporation: Metabolism Measurement at the Crystal River, Florida Nuclear Power Plant, Dept. of Env. Eng. Sci., Univ. of Florida, 3/80.
- Goforth, G., Critical Parameters in Construction and Reconstruction of Freshwater Wetlands: Hydrology, The Center for Wetlands, University of Florida, Florida, June 1980.
- Huber, W.C., Brezonik, P.L., Heaney, J.P., Cullum, M.G., Polmann, D.J. and G.F. Goforth, An Environmental Study of Hogtown Creek in Gainesville, Florida, Publication No. 59, Florida Water Resources Research Center, University of Florida, Gainesville, June 1981, 150 pp.
- Goforth, G., Long-Term Performance of Stormwater Detention Facilities: A Comparison of Design Methodologies, Pub. No. 58, Florida Water Resources Research Center, Univ. of Florida, 1981.
- Goforth, F., Preliminary Report - Field Survey of Somerville Lake, EH&A Doc. No. 81350, 1981.
- Stubblefield D., J. Cromer and G. Goforth, Assessment of Surface Water Impact, Fayette County Lignite Surface Mine, EH&A Doc. No. 81403, August 1981.
- Goforth, G., Wastewater Facility Needs, Upper Guadalupe River Basin, EH&A Doc. No. 81579, December 1981.
- Goforth, G. and D. Carlyle, Summary Report, Water Quality Studies, Nueces River Basin, EH&A Doc. No. 82034, February 1982.
- Goforth, G., Lake Corpus Christi Chloride Budget Study, EH&A Doc. No. 8160, March 1982.
- Goforth, G., Baseline Surface Water Quality, Powell Bend Mine Project, EH&A Doc. No. 81576, July 1982.
- Goforth, G., Assessment of Surface Water Impact, Powell Bend Lignite Surface Mine, EH&A Doc. No. 82282, July 1982.
- Goforth, G., Design of Data Collection Program, Longview Urban Runoff Program, EH&A Doc. No. 82115, July 1982.
- Goforth, G., Overview and Results of the Baseline Water Quality Monitoring Program for Motorola's Oak Hill Site, EH&A Doc. No. 82443, September 1982 - October 1983.
- Goforth, G., Statistical Characterization of Rainfall, Cross Lake Watershed Study, EH&A Doc. No. 83106, March 1983.



- Goforth, G., Hydrologic Evaluation of Concrete Overflow Dam Hurst Creek MUD Dams Nos. 1 and 2, EH&A Doc. No. 83156, March 1983.
- Goforth, G., E. Diniz and J. Rauhaut, Stormwater Hydrological Characteristics of Porous and Conventional Paving Systems, EPA Grant No. R806338-01-2 with City of Austin, Texas, EH&A Doc. No. 82336, April 1983, also EPA-600/S2-83-106, February 1984.
- Goforth, G., Thermal Simulation of the P.H. Robinson Discharge, EH&A Doc. No. 83618, Nov. 1983.
- Goforth, G., The Theory of Evapoconsolidation in Fine-grained Material Containment Areas, U.S. Army Engineer Waterways Experiment Station.
- Goforth, G., Technical Feasibility of Centrifugal Techniques for Evaluation Hazardous Water Migration, Ph.D. Dissertation, University of Florida, Gainesville, Florida, March 1986.
- Goforth G., Settlement Agreement Load Reductions, June 2002
- Goforth G., Settlement Agreement Load Reductions – Updated, September 2002
- Goforth G., The Operational Design Envelope For The STAs, May 2004
- Goforth G. and T. Piccone, 2004 (working draft), Strategy for Using Compartments B & C for Water Quality Improvement .
- Abteu W., G Goforth, and G. Germain, 2004, Stormwater Treatment Areas: Constructed Wetlands for Phosphorus Removal in South Florida Surface Waters, January 2004, Technical Paper #414.
- Goforth, G. F. 2005, Summary of STA Vegetation Management Practices, prepared for the South Florida Water Management District, February 2005.
- Goforth, G., 2005, Preliminary Estimates of Loads to the Refuge After STA-1E is in Operation, May 2005.
- Nearhoof Frank, K. Weaver, G. Goforth, and S. Xue. 2005. Test for Determining Achievement of 50 ppb Phosphorus Initial TBEL For Everglades Stormwater Treatment Areas. August 2005.
- Pietro, K. and G. Goforth, 2005, C-51W Sub-basin Updated Analysis of Flow and Phosphorus Data. June 2005. Technical Publication ERA #430.
- Goforth, G., April 2005, Compilation of Florida's TMDL Program Information, for the South Florida Water Management District.



- Goforth, G., August 2005, Operation Plan for the Taylor Creek/Grassy Island Stormwater Treatment Area, prepared for the South Florida Water Management District.
- Goforth, G. and R. Meeker, August 2005, Vegetation Management Plan for the Taylor Creek/Grassy Island Stormwater Treatment Area, prepared for the South Florida Water Management District.
- Goforth, G., August 2005, Performance Plan for the Taylor Creek/Grassy Island Stormwater Treatment Area, prepared for the South Florida Water Management District.
- Goforth, G., November 2005, Operation Plan for the Nubbin Slough / New Palm Stormwater Treatment Area, prepared for the South Florida Water Management District.
- Goforth, G., November 2005, Performance Plan for the Nubbin Slough / New Palm Stormwater Treatment Area, prepared for the South Florida Water Management District.
- Goforth, G., January 2006, Operation Plan for the Ten Mile Creek Water Preserve Area, prepared for the South Florida Water Management District.
- Goforth, G., January 2006, Performance Plan for the Ten Mile Creek Water Preserve Area, prepared for the South Florida Water Management District.
- Goforth, G., January 2006, Interim Operation Plan Stormwater Treatment Area 1 East, prepared for the South Florida Water Management District.
- Goforth, G., February 2006, Integrated Operation Plan Stormwater Treatment Areas 5 and 6, prepared for the South Florida Water Management District.
- Goforth, G., February 2006, Integrated Pollution Prevention Plan Stormwater Treatment Areas 5 and 6, prepared for the South Florida Water Management District.
- Goforth, G., March 2006, Updated Operation Plan Stormwater Treatment Area 2, prepared for the South Florida Water Management District.
- Goforth, G., February 2006. Updated Pollution Prevention Plan Stormwater Treatment Area 2, prepared for the South Florida Water Management District.
- Goforth, G. October 2006, Preliminary Sizing Analysis of the Proposed EAASR STA - Final Draft, prepared for the South Florida Water Management District.
- Goforth, G., August 2006. Conceptual-level Sizing Analysis of the Proposed EAA Storage Reservoir STA, prepared for the South Florida Water Management District.



- Goforth, G., July 2006. Lake Okeechobee Regulation Schedule Study - Evaluation of the Base Condition and the Tentatively Selected Plan on the Performance of STA-3/4, prepared for the South Florida Water Management District.
- Goforth, G., June 2006. Five-Year Summary Of Operations Affecting WCA-1, prepared for the South Florida Water Management District.
- Goforth, G., February 2006. STA-3/4 Phosphorus Loading Performance Measure, prepared for the South Florida Water Management District.
- Goforth, G., August 2006. Conceptual-level Sizing Analysis of the Proposed EAASR, prepared for the South Florida Water Management District.
- Goforth, G. October 2006. Sizing Analysis of the Proposed EAASR STA - Final Draft, prepared for the South Florida Water Management District.
- Goforth, G. December 2006. EAASR STAR Preliminary Alternatives Evaluation, prepared for the South Florida Water Management District.
- Goforth, G. February 2007. Evaluation Of An Alternative Method For Assessing Compliance With The Load Reduction Expectations Of The Settlement Agreement, prepared for the South Florida Water Management District.
- Goforth, G., N. Iricanin, S. Hill, S. Xue, T. Piccone, F. Nearhoof, K. Weaver 2007. Technical Support Document for the STA-2 TBEL. May 2007.
- Goforth, G., N. Iricanin, S. Hill, S. Xue, T. Piccone, F. Nearhoof, K. Weaver 2007. Technical Support Document for the STA-5 TBEL. June 2007.
- Goforth, G., N. Iricanin, S. Hill, S. Xue, T. Piccone, F. Nearhoof, K. Weaver 2007. Technical Support Document for the STA-6 TBEL. June 2007.
- Goforth, G. 2007. Operation Plan Integrated STA-5 and STA-6. Prepared for the South Florida Water Management District. August 2007.
- Goforth, G. 2007. Pollution Prevention Plan Integrated STA-5 and STA-6. Prepared for the South Florida Water Management District. August 2007.
- Goforth, G. 2007. Updated Flow and Phosphorus Data Sets for the ECP Basins Covering the Period May 1, 1994 - April 30, 2007. Prepared for the South Florida Water Management District. October 2007.
- Goforth, G. 2007. Updated STA Inflow Data Sets For the 2010 Planning Period. Prepared for the South Florida Water Management District. October 2007.



Goforth, G. 2007. Updated STA Phosphorus Modeling For the 2010 Planning Period. Prepared for the South Florida Water Management District. October 2007.

Goforth, G. , N. Iricanin, S. Hill, S. Xue, T. Piccone, F. Nearhoof, K. Weaver 2007. Technical Support Document for the STA-1E TBEL. October 2007.

Goforth, G. , N. Iricanin, S. Hill, S. Xue, T. Piccone, F. Nearhoof, K. Weaver 2007. Technical Support Document for the STA-1W TBEL. October 2007.

Goforth, G. 2008. Technical Memorandum - Examples Of STA-2 Flow-way Hydraulic Analyses Using Existing Data. Prepared for the South Florida Water Management District. February 2008.

Goforth, G. 2008. Technical Memorandum - Examples of STA-3/4 Flow-way Hydraulic Analyses Using Existing Data. Prepared for the South Florida Water Management District. March 2008.

Goforth, G. 2008. Technical Memorandum - Examples of STA-1E Flow-way Hydraulic Analyses Using Existing Data. Prepared for the South Florida Water Management District. April 2008.

CH2M Hill and Goforth, G. 2008. Everglades 2008 Report Technical Memorandum 3.2.1 – Evaluation of Analytical Tools. Prepared for the South Florida Water Management District. March 2008.

Goforth, G. and CH2M Hill 2008. Everglades 2008 Report Technical Memorandum 3.3.1 – Updated Basin Data. Prepared for the South Florida Water Management District. March 2008.

Goforth, G. and CH2M Hill 2008. Everglades 2008 Report Technical Memorandum 3.1.1 – Water Quality Performance Evaluation of the Pre-2006 Projects. Prepared for the South Florida Water Management District. April 2008.

CH2M Hill and Goforth, G. 2008. Everglades 2008 Report Technical Memorandum 2.1.1 – Evaluation Methods for Alternatives Analysis Supporting Plan Formulation. Prepared for the South Florida Water Management District. April 2008.

CH2M Hill and Goforth, G. 2008. Everglades 2008 Report Technical Memorandum 2.2.1 – Candidate Hydropattern Restoration Alternatives for the Northern Everglades Protection Area. Prepared for the South Florida Water Management District. May 2008.

Goforth, G. 2008. Technical Memorandum - Influence of STA-5 Operation on C-139 Basin Load Compliance. Prepared for the South Florida Water Management District. June 2008.



CH2M Hill and Goforth, G. 2008. Everglades 2008 Report Technical Memorandum 3.4.1 – Potential Supplemental Water Quality Improvement Measures. Prepared for the South Florida Water Management District. July 2008.

Goforth, G. 2008. Technical Memorandum - Independent Technical Review of Intermediate Design Report Technical Memorandum No. 1: Water Budget Modeling. Prepared for ADA Engineering and URS Corporation. July 2008.

Goforth, G. 2008. Technical Memorandum - Independent Technical Review of Intermediate Design Report Technical Memorandum No. 3: Phosphorus Removal Performance. Prepared for ADA Engineering and URS Corporation. July 2008.

ACADEMIC HONORS AND AWARDS

Tau Beta Pi, Engineering Honor Society University of Florida - 1979

Phi Kappa Phi, Academic Honor Society University of Florida - 1979

Government Engineer of the Year (1998), awarded by Palm Beach Branch American Society of Civil Engineers

President's Award, presented by the Florida Association of Environmental Professionals, Treasure Coast Chapter, September 2005

Outstanding Technical Achievement 2005-2006, awarded by Palm Beach Chapter, Florida Engineering Society, April 2006