

APPENDIX A SUB-TEAM UPDATE

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Technical Oversight Committee July 18, 2017



TOC Direction to Sub-team

June 27, 2017: Appendix A Subteam meeting held; continued progress on the following directives:

- Evaluate incorporation of S-356
 to the Shark River Slough
 compliance calculation, as
 appropriate.
- Evaluate incorporation of G-737 and S-328 to the Taylor Slough and Coastal Basins compliance calculation, as appropriate.





S-356 / Shark River Slough (SRS): Progress

<u>Purpose</u>: Methodology being contemplated to <u>estimate portion</u> of flow at S356 that is *from the WCAs* that proposes to use open channel (USGS) flow data in the L-31N Canal

Meeting Focus:

- Uncertainty of flow data
- Uncertainty of TP collection and laboratory analysis variability
- Potential impact on certainty of future compliance results

Status:

- SFWMD provided flow ratings and draft uncertainty analysis of flow ratings to team for SRS structures S-333, S-334, and S-356
- USACE has obtained field measurements and flow equation derivations for open channel flow sites in the L-31N Canal



S-356 / Shark River Slough (SRS):

Next Steps

- USACE proposes to document flow rating and uncertainty for flows from south to north in the L-31N Canal (toward S-356)
- USACE to provide existing USGS flow rating and uncertainty information for the S-12 structures, as available
- SFWMD to pursue quantification of TP concentration uncertainty (both sampling replicates and lab uncertainty)





Taylor Slough and Coastal Basins (TSCB): Progress

<u>Purpose</u>: Assess monitoring and compliance reporting needs based upon Florida Bay Initiative/Taylor Slough Headwaters project, which is modifying surface water flows to TSCB

Meeting Focus:

- Establish interim reporting mechanisms and plan for future evaluation of compliance reporting
- Ensure flow and TP monitoring is adequate to support reporting and evaluation needs (i.e. 1-page monitoring agreement)

Status:

- SFWMD initiated monitoring at G-737 and S-328 locations and synchronized sampling to facilitate compliance evaluation
- Interim reporting to Technical Oversight Committee proposed in format similar to Shark River Slough with 3 alternative methods



Taylor Slough and Coastal Basins (TSCB):

Interim Reporting

Three alternative methods of TP FWMC proposed for interim reporting to the Technical Oversight Committee:

TP x Flow at each site / Total Flow*

- 1. S332D +S18C (current method)
- 2. S332D + S18C + G737
- 3. [S332D S332DX1 S328] + S328 + G737 + S18C

*Method 3 exception: TP(S332D) x Flow(S332D-S332DX1-S328)





Taylor Slough and Coastal Basins (TSCB): Next Steps

- SFWMD to develop a TSCB data tracking spreadsheet for the 3 alternative methods similar to what is currently produced for SRS
- Flows were initiated June 2017 through G-737 to Taylor Slough;
 These 2nd Quarter 2017 provisional results will be presented at next regular TOC meeting (October 2017?)
- S-328 has not discharged; Operation depends upon construction features (canal plugs) and water levels; Earliest discharge late August 2017?
- TP samples will continue to be collected weekly along with continuous flow monitoring; The 3 TCSB alternative methods will be tracked quarterly and TP/flow data will be made available on an ongoing basis



Questions?



SFWMD Monitoring of S-328 (S-332D Detention Area Cell 1 Outflow)

The S-328 water control structure consists of eight (8) manually-operable gated 60-inch in diameter culverts. It is in the L-31W levee at the southwest corner of Cell 1 of the S-332D detention area. The structure discharges water from Cell 1 into the L-31W borrow canal (adjacent to Everglades National Park).

Water Quality Monitoring

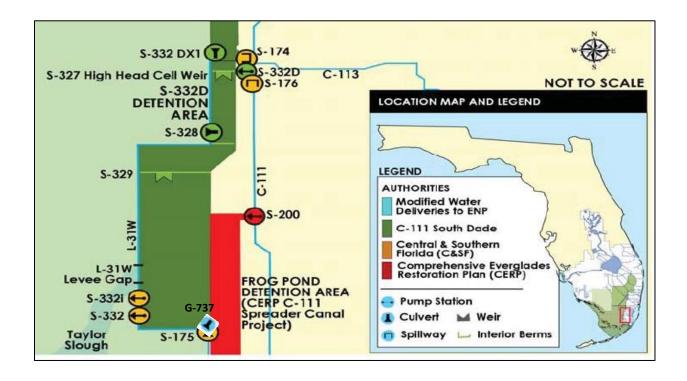
SFWMD will collect grab samples on the upstream and downstream sides of the S-328 structure on a weekly basis beginning the week of July 3-7, 2017 and for an initial period of two years.

Parameters measured will include total phosphorus (TP), ortho-phosphate and physical parameters (temperature, total suspended solids, pH, dissolved oxygen and specific conductance). The SFWMD laboratory will analyze the samples and report results on a priority basis. Preliminary data may be available approximately one week after sampling and will be made available to interested staff for review. The SFWMD will also make the data available, after undergoing normal QA data validation procedures, through DBHydro generally within a month after collection. The water quality monitoring data is intended to be used for reporting and evaluation purposes associated with FDEP Emergency Order #9 "Emergency Authorization to Operate the S-332B, S-332C, and S-332D Pump Stations and Appurtenant Structures" issued to the USACE and for tracking progress with the Taylor Slough and Coastal Basins long-term limit and goal for discharges into Everglades National Park established under the Everglades Settlement Agreement (Appendix A). At the end of the initial two-year period, the water quality monitoring will be revisited and appropriate reductions or modifications will be implemented based on guidance from the Everglades Technical Oversight Committee charged with tracking progress with the Everglades Settlement Agreement Appendix A requirements.

Hydrologic Monitoring

Stage levels will be measured using pressure sensor probes on both the headwater and tailwater side of the S-328 structure. These probes will record stage data at 15-minute intervals and store this data locally on-site. The headwater probe will be secured through a PVC or metal pipe attached to the existing catwalk at the structure. The tailwater probe will be secured through a PVC or metal pipe that is attached to the existing staff gauge or other in-water structure. For a minimum of the initial 8 weeks with recorded positive flow at S-328, SFWMD staff will retrieve the data and confirm calibration of the sensors (accomplished by comparing the current sensor readings to the existing staff gauges) on a bi-weekly frequency (once every two weeks). After the initial 8-week operational period at S-328, SFWMD staff will retrieve the data and confirm sensor probe calibration once per month. Any gate operations (gate height and time of opening and closing) during the month will be recorded by SFWMD at the time of gate position changes. Preliminary stage and gate operations data will first be uploaded to the SFWMD's internal database and will be made available to interested staff for review. The SFWMD FLOW program will automatically compute preliminary discharge rates through the culvert(s) associated with gate openings. After undergoing QA/QC data validation, the stage, gate, and flow data will be made available in DBHydro within two weeks after collection. Stage data from the pressure sensor probes, gate opening information, and computed S-328 flows will continue to be provided by SFWMD for continued S-328 operations until implementation of MWD Increment 3 (Combined Operations Plan [COP]) begins. Currently COP is anticipated to begin no later than 31 December 2019. Data collected by SFWMD will be used to evaluate

the need for continued hydrological monitoring at the S-328 structure, with future monitoring requirements identified within the COP monitoring plan.



Taylor Slough and Coastal Basins Data Tracking Alternative **Method 1**: S332D + S18C Total Phosphorus (TP) Tracking Provisional Data Report

0	TP Concentr	ration (mg/L)	Daily Mear	Flow (cfs)	Sampling Events				
Sampling Event Date	\$332DX	S18C	\$332D	S18C	Sampled Flow (cfs)	Total Loads (cfs*mg/L)	FWMC (ppb)		
10/3/2016	0.005		518	421	518	3	5.0		
10/4/2016	0.005	0.004	557	360	360	1	4.0		
10/10/2016	0.005	0.000	495	249 206	495	2	5.0		
10/11/2016 10/17/2016	0.005	0.003	483 452	220	206 452	1 2	3.0 5.0		
10/17/2016	0.003	0.003	440	231	231	1	3.0		
10/24/2016	0.005	0.000	429	213	429	2	5.0		
10/25/2016		0.003	433	158	158	0	3.0		
10/31/2016	0.005		485	290	485	2	5,0		
11/1/2016		0.004	484	291	291		4.0		
11/7/2016	0.007		500	250	500	3	7.0		
11/8/2016	0.005	0.003	496 533	261 235	261 533	1 3	3.0 5.0		
11/14/2016 11/15/2016	0.005	0.005	488	204	204	3	5.0		
11/21/2016	0.005	0.003	490	214	490	2	5.0		
11/22/2016	0.000	0.002	472	191	191	0	2.0		
11/28/2016	0.005		429	201	429	2	5.0		
11/29/2016		0.004	384	204	204		4.0		
12/5/2016	0.006		167	273	167	1	6.0		
12/6/2016		0.004	191	225	225	1	4.0		
12/12/2016	0.006		173	271	173	1	6.0		
12/13/2016	0.005	0.004	191	235	235	1	4.0		
12/19/2016	0.005	0.004	186	225 189	186 189	<u>1</u> 1	5.0 4.0		
12/20/2016 12/27/2016	0.005	0.004	124	180	124	1	5.0		
12/28/2016	0.003	0.004	118	167	167	1	4.0		
1/3/2017	0.005	0.001	124	140	124	1	5.0		
1/4/2017		0.004	140	181	181	1	4.0		
1/9/2017	0.004		66	148	65.56	0.26	4.0		
1/10/2017		0.004	67	146	146	1	4.0		
1/17/2017	0.006		65	127	65	0	6.0		
1/18/2017		0.004	68	105	105	0	4.0		
1/23/2017	0.008	0.004	67	70	67	1	8.0		
1/24/2017 1/30/2017	0.006	0.004	69 62	53 57	53 62	0	4.0 6.0		
1/31/2017	0.006	0.004	68	77	77	0	4.0		
2/6/2017	0.006	0.004	135	57	135	1	6.0		
2/7/2017		0.006	140	70	70	0	6.0		
2/13/2017	0.006		134	38	134	1	6.0		
2/14/2017		0.004	139	39	39	0	4.0		
2/20/2017	0.006		118	53.9	118	1	6.0		
2/21/2017		0.004	102	63.5	64	0	4.0		
2/27/2017	0.004	0.004	91	92.7	91	0	4.0		
2/28/2017 3/6/2017	0.007	0.004	101 86	57.6 34	58 86	<u> </u>	4.0 7.0		
3/7/2017	0.007	0.005	67	63.2	63	0	5.0		
3/13/2017	0.008	0.000	19	82.7	19	0	8.0		
3/14/2017		0.005	37	37.5	38	0	5.0		
3/20/2017	0.006		0	17.8	0	0			
3/21/2017		0.006	0	34.1	34	0	6.0		
3/27/2017	0.006		0	45.3	0	0			
3/28/2017		0.009	0	46.4	46	0	9.0		
					40.84				
Period			Flow ¹	12-Month Long-term Limit	12-Month FWMC ²	Percent of Sampling Ever Greater than 10 ppb			
		acre	-feet	(ppb)	(ppb)	Observed	Guideline		
October 2016 - September 2017				11.0			53.1%		

Blue shaded and **bolded** dates are the bi-weekly compliance sampling events and corresponding flow-weighted mean concentrations (FWMC). Light green shaded cell indicates there was flow at the site on the sampling day.

Taylor Slough and Coastal Basins Data Tracking Alternative Method 2: S332D + G737 + S18C

Total Phosphorus (TP) Tracking Provisional Data Report

Committee Trans	Concentration (mg	J/L)			Sampling Events					
Sampling Event Date	S332DX S18C		G737	S332D	S18C	G737	Sampled Flow (cfs)	Total Loads (cfs*mg/L)	FWMC (ppb)	
10/3/2016	0.005			518	421		518	3	5.0	
10/4/2016	0.005	0.004		557	360		360	1	4.0	
10/10/2016 10/11/2016	0.005	0.003		495 483	249 206		495 206	2	5.0 3.0	
10/17/2016	0.005	0.003		452	220		452	2	5.0	
10/18/2016		0.003		440	231		231	1	3.0	
10/24/2016	0.005	0.000		429	213		429	2	5.0	
10/25/2016 10/31/2016	0.005	0.003		433 485	158 290		158 485	0	3.0 5.0	
11/1/2016	0.000	0.004		484	291		291	/1	4.0	
11/7/2016	0.007			500	250		500	3	7.0	
11/8/2016 11/14/2016	0.005	0.003		496 533	261 235		261 533	1 3	3.0 5.0	
11/15/2016	0.005	0.005		488	204		204	1	5.0	
11/21/2016	0.005	3.000		490	214	1	490	2	5.0	
11/22/2016		0.002		472	191		191	0	2.0	
11/28/2016 11/29/2016	0.005	0.004		429 384	201		429 204	2	5.0 4.0	
12/5/2016	0.006	0.004		167	273		167	1	6.0	
12/6/2016		0.004		191	225		225	1	4.0	
12/12/2016	0.006	0.551		173	271		173	1	6.0	
12/13/2016 12/19/2016	0.005	0.004		191 186	235 225		235 186	1	4.0 5.0	
12/20/2016	0.003	0.004		181	189		189	1	4.0	
12/27/2016	0.005			124	180		124	1	5.0	
12/28/2016		0.004	-	118	167		167	1	4.0	
1/3/2017 1/4/2017	0.005	0.004		124 140	140 181		124 181	1	5.0 4.0	
1/9/2017	0.004	0.004		66	148		65.56	0.26	4.0	
1/10/2017		0.004	_	67	146		146	1	4.0	
1/17/2017	0.006			65	127		65	0	6.0	
1/18/2017 1/23/2017	0.008	0.004		68 67	105 70		105 67	0	4.0 8.0	
1/24/2017	0.008	0.004		69	53		53	0	4.0	
1/30/2017	0.006			62	57		62	0	6.0	
1/31/2017		0.004		68	77		77	0	4.0	
2/6/2017 2/7/2017	0.006	0.006		135 140	57 70		135 70	0	6.0 6.0	
2/13/2017	0.006	0.000		134	38		134	1	6.0	
2/14/2017		0.004		139	39		39	0	4.0	
2/20/2017	0.006			118	53.9		118	1	6.0	
2/21/2017 2/27/2017	0.004	0.004		102 91	63.5 92.7		64 91	0	4.0 4.0	
2/28/2017	0.004	0.004		101	57.6		58	0	4.0	
3/6/2017	0.007			86	34		86	1	7.0	
3/7/2017	0.000	0.005		67	63.2		63	0	5.0	
3/13/2017 3/14/2017	0.008	0.005		19 37	82.7 37.5		19 38	0	8.0 5.0	
3/20/2017	0.006	V.000		0	17.8		0	0	0.0	
3/21/2017		0.006		0	34.1		34	0	6.0	
3/27/2017 3/28/2017	0.006	0.009		0	45.3 46.4		0 46	0	9.0	
3/20/2017		0.009		U	40.4		40	0	9.0	
	 	 								
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Period		Total Flow ¹		12-Month Long-term Limit	12-Month FWMC ²		mpling Events an 10 ppb			
		acre-feet		(ppb)	(ppb)	Observed	Guideline	1		
October 2016 - September 2017				11.0			53.1%			

Blue shaded and **bolded** dates are the bi-weekly compliance sampling events and corresponding flow-weighted mean concentrations (FWMC). Light green shaded cell indicates there was flow at the site on the sampling day.

Taylor Slough and Coastal Basins Data Tracking Alternative **Method 3**: [S332D-S332DX1-S328] + S328 + G737 + S18C Total Phosphorus (TP) Tracking Provisional Data Report

Compline Torres	TP Concentration (mg/L)				Daily Mean Flow (cfs)						Sampling Events		
Sampling Event Date	S332DX	S18C	S328	G737	S332D-S332DX1 -S328	S18C	S328	G737	\$332D	S332DX1	Sampled Flow (cfs)	Total Loads (cfs*mg/L)	FWMC (ppb)
10/3/2016	0.005				518	421			518	0	518	3	5.0
10/4/2016 10/10/2016	0.005	0.004			557 495	360 249			557 495	0	360 495	1	4.0
10/11/2016	0.005	0.003			483	206			483	0	206	1	5.0 3.0
10/17/2016	0.005	0.000			452	220			452	0	452	2	5.0
10/18/2016	0.005	0.003			440	231			440	0	231	1	3.0
10/24/2016 10/25/2016	0.005	0.003			429 433	213 158			429 433	0	429 158	0	5.0 3.0
10/31/2016	0.005	0.000			485	290			485	0	485	2	5.0
11/1/2016		0.004			484	291			484	0	291	1	4.0
11/7/2016 11/8/2016	0.007	0.003			500 496	250 261			500 496	0	500 261	3	7.0 3.0
11/14/2016	0.005	0.003			533	235		/	533	0	533	3	5.0
11/15/2016		0.005			488	204			488	0	204	1	5.0
11/21/2016 11/22/2016	0.005	0.002			490 472	214 191			490 472	0	490 191	0	5.0 2.0
11/28/2016	0.005	0.002			429	201			472	0	429	2	5.0
11/29/2016		0.004			384	204			384	0	204	1	4.0
12/5/2016	0.006	0.001			167	273			167	0	167	1	6.0
12/6/2016 12/12/2016	0.006	0.004			191 173	225 271			191 173	0	225 173	1	4.0 6.0
12/13/2016		0.004			191	235			191	0	235	1	4.0
12/19/2016	0.005	6 :			186	225			186	0	186	1	5.0
12/20/2016 12/27/2016	0.005	0.004			181 124	189 180			181 124	0	189 124	1	4.0 5.0
12/28/2016	0.005	0.004			118	167			118	0	167	1	4.0
1/3/2017	0.005				124	140		\rightarrow	124	0	124	1	5.0
1/4/2017	0.004	0.004			140	181			140	0	181	1	4.0
1/9/2017 1/10/2017	0.004	0.004			66 67	148 146	\sim		66 67	0.01	65.55 146	0.26 1	4.0 4.0
1/17/2017	0.006	0.001			65	127			65	0	65	0	6.0
1/18/2017		0.004			68	105			68	0	105	0	4.0
1/23/2017 1/24/2017	0.008	0.004			67 69	70 53			67 69	0	67 53	0	8.0 4.0
1/30/2017	0.006	0.004			62	57			62	0	62	0	6.0
1/31/2017		0.004			68	77			68	0	77	0	4.0
2/6/2017	0.006	0.006			135	57			135 140	0	135 70	0	6.0 6.0
2/7/2017 2/13/2017	0.006	0.006			140 134	70 38			134	0	134	1	6.0
2/14/2017		0.004			139	39			139	0	39	0	4.0
2/20/2017	0.006				118 102	53.9			118 102	0	118 64	1	6.0 4.0
2/21/2017 2/27/2017	0.004	0.004			91	63.5 92.7			91	0	91	0	4.0
2/28/2017		0.004			101	57.6			101	0	58	0	4.0
3/6/2017	0.007	0005			86	34			86	0	86	1	7.0
3/7/2017 3/13/2017	0.008	0.005			67 19	63.2 82.7			67 19	0	63 19	0	5.0 8.0
3/14/2017	5.500	0.005		~	37	37.5			37	0	38	0	5.0
3/20/2017	0.006				0	17.8			0	0	0	0	
3/21/2017 3/27/2017	0.006	0.006			0	34.1 45.3			0	0	34 0	0	6.0
3/28/2017	0.006	0.009	\checkmark		0	46.4			0	0	46	0	9.0
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Period		Total	Flow ¹	12-Month Long-term Limit		12-Month FWMC ²		Pe		mpling Ever nan 10 ppb	pling Events		
			acre	-feet	(ppb)		(ppb)		Observed		Guideline		1
October 2016 - September 2017					"" / "" /" /					.1%	1		

Blue shaded and **bolded** dates are the bi-weekly compliance sampling events and corresponding flow-weighted mean concentrations (FWMC). Light green shaded cell indicates there was flow at the site on the sampling day.