

Biological Analysis Report

SW-DIST-2018-07-25-01

Florida Department of Environmental Protection
Central Laboratory
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Tallahassee, FL 32399-2400
DOH Accreditation E31780

Overflow Analyses Performed By:
Advanced Environmental Laboratories - Tampa
9610 Princess Palm Avenue
Tampa, Florida 33619
DOH Accreditation E84589

Event Description: **Spartman, Flint, Bellows, Baker**
Request ID: **RQ-2018-07-23-02**
Customer: **SW-DIST**
Project ID: **SMP**

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Date Certified: 05-SEP-2018 16:52



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Chlorophyll/Grain Size/BOD, Molecular and Overflow.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Spartman Branch @ Harvey Tew Rd

Collection Date/Time: 07/24/2018 11:20

Field ID: G2SW0067

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010299	EPA 1603	Escherichia coli-Membrane Filter**	1000	B	cfu/100 mL		

Sample Location: Spartman Branch @ Harvey Tew Rd

Collection Date/Time: 07/24/2018 11:20

Field ID: G2SW0067

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010268	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P349949	
	SOP-PCR-1.4	BacR-qPCR**	3.9E+04	J	TSC/100 mL	P349949	MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Ref. Method and Comment:
 SOP-PCR-1.4: Quality control failure(s) observed. See QA report for details.

Sample Location: Spartman Branch @ US 92

Collection Date/Time: 07/24/2018 11:30

Field ID: G2SW0013

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010300	EPA 1603	Escherichia coli-Membrane Filter**	3100		cfu/100 mL		

Sample Location: Spartman Branch @ US 92

Collection Date/Time: 07/24/2018 11:30

Field ID: G2SW0013

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010270	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P349949	
	SOP-PCR-1.4	BacR-qPCR**	4.19E+06	J	TSC/100 mL	P349949	MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Ref. Method and Comment:
 SOP-PCR-1.4: Quality control failure(s) observed. See QA report for details.

Sample Location: Flint Creek @ SR 301 TP39

Collection Date/Time: 07/24/2018 10:27

Field ID: G2SW0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010301	EPA 1603	Escherichia coli-Membrane Filter**	172		cfu/100 mL		

Sample Location: Flint Creek @ SR 301 TP39

Collection Date/Time: 07/24/2018 10:27

Field ID: G2SW0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010271	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

Sample Location: Flint Creek @ Knights Griffin Rd

Collection Date/Time: 07/24/2018 10:45

Field ID: G2SW0066

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010302	EPA 1603	Escherichia coli-Membrane Filter**	3600		cfu/100 mL		

Sample Location: Flint Creek @ Knights Griffin Rd

Collection Date/Time: 07/24/2018 10:45

Field ID: G2SW0066

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010272	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P349949	
	SOP-PCR-1.4	BacR-qPCR**	8.13E+05		TSC/100 mL	P349949	MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Sample Location: Bellows Lake Outlet

Collection Date/Time: 07/24/2018 12:05

Field ID: G1SW0060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010267	SM 10200 H (mod.)	Chlorophyll-a, Corrected	55		ug/L	P349530	
		Phaeophytin-a	7.1		ug/L	P349530	
		Chlorophyll-a, Uncorrected	61		ug/L	P349530	

Sample Location: Bellows Lake Outlet

Collection Date/Time: 07/24/2018 12:05

Field ID: G1SW0060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010303	EPA 1603	Escherichia coli-Membrane Filter**	900	B	cfu/100 mL		

Sample Location: Bellows Lake Outlet

Collection Date/Time: 07/24/2018 12:05

Field ID: G1SW0060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2010273	SOP-PCR-1.0	HF183-purified-qPCR**	24	UJ	GEU/100 mL	P350553	LCS, SUR
	SOP-PCR-1.2	GULL2-purified-qPCR**	1.4E+03	UJ	TSC/100 mL	P350553	LCS, SUR
	SOP-PCR-1.3	GFD-purified-qPCR**	170	UJ	TSC/100 mL	P350553	MS
	SOP-PCR-1.4	BacR-purified-qPCR**	250	UJ	TSC/100 mL	P350553	LCS, SUR
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Ref. Method and Comment:

SOP-PCR-1.0: Quality control failure(s) observed. See QA report for details. Precision data unavailable for Analysis Batch A86228
SOP-PCR-1.2: Quality control failure(s) observed. See QA report for details. Precision data unavailable for Analysis Batch A86270.
SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details. Precision data unavailable for Analysis Batch A86279.
SOP-PCR-1.4: Quality control failure(s) observed. See QA report for details. Precision data unavailable for Analysis Batch A86247

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P349530

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.55	U	ug/L
Chlorophyll-a, Uncorrected	0.40	U	ug/L
Phaeophytin-a	0.40	U	ug/L

Reference Method: SOP-PCR-1.0

Batch ID: P349949

Component	Result	Code	Units
HF183-qPCR	280	U	GEU/100 mL

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
Batch ID: P350553

Component	Result	Code	Units
HF183-purified-qPCR	47	U	GEU/100 mL

Reference Method: SOP-PCR-1.2
Batch ID: P350553

Component	Result	Code	Units
GULL2-purified-qPCR	2.8E+03	U	TSC/100 mL

Reference Method: SOP-PCR-1.3
Batch ID: P350553

Component	Result	Code	Units
GFD-purified-qPCR	340	U	TSC/100 mL

Reference Method: SOP-PCR-1.4
Batch ID: P349949

Component	Result	Code	Units
BacR-qPCR	3.0E+03	U	TSC/100 mL

Reference Method: SOP-PCR-1.4
Batch ID: P350553

Component	Result	Code	Units
BacR-purified-qPCR	510	U	TSC/100 mL

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P349530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	92.9		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P349949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	108	133	P/P	50 - 175

Reference Method: SOP-PCR-1.0
Batch ID: P350553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-purified-qPCR	104	17.1	P/F	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P350553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.2
Batch ID: P350553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-purified-qPCR	99.7	24.5	P/F	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P350553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	117	61.0	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P349949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	169	117	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P350553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-purified-qPCR	82.9	36.2	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P349949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010268	HF183-qPCR	71.8		P	50 - 175
2010270	HF183-qPCR	99.8		P	50 - 175
2010272	HF183-qPCR	76.6		P	50 - 175
2012344	HF183-qPCR	102		P	50 - 175
2012345	HF183-qPCR	112		P	50 - 175
2012346	HF183-qPCR	116		P	50 - 175
2012394	HF183-qPCR	107		P	50 - 175
2012935	HF183-qPCR	101		P	50 - 175
2012937	HF183-qPCR	93.7		P	50 - 175
2017360	HF183-qPCR	91.1		P	50 - 175
2017361	HF183-qPCR	104	118	P/P	50 - 175
2017362	HF183-qPCR	62.4		P	50 - 175

Reference Method: SOP-PCR-1.0
Batch ID: P350553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010273	HF183-purified-qPCR	102		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P350553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010273	GULL2-purified-qPCR	99.6		P	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.3

Batch ID: P350553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010273	GFD-purified-qPCR	35.4		F	50 - 175
2012935	GFD-purified-qPCR	102		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P349949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010268	BacR-qPCR	28.5		F	50 - 175
2010270	BacR-qPCR	44.6		F	50 - 175
2010272	BacR-qPCR	50.7		P	50 - 175
2012935	BacR-qPCR	88.1		P	50 - 175
2017360	BacR-qPCR	57.7		P	50 - 175
2017361	BacR-qPCR	80.6	77.8	P/P	50 - 175
2017362	BacR-qPCR	56.1		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P350553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2010273	BacR-purified-qPCR	81.1		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)

Batch ID: P349530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2010276	Chlorophyll-a, Corrected	2.82	Sample	P	0 - 25
2010276	Chlorophyll-a, Uncorrected	0.613	Sample	P	0 - 25
2010276	Phaeophytin-a	6.15	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0

Batch ID: P349949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017361	HF183-qPCR	13.0	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4

Batch ID: P349949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2017361	BacR-qPCR	3.22	Spike	P	0 - 25

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Surrogates

Lab Sample ID: 2010268
Field Sample ID: G2SW0067

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	84200	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	67.4	P	50 - 300

Lab Sample ID: 2010270
Field Sample ID: G2SW0013

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	91100	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	79.4	P	50 - 300

Lab Sample ID: 2010272
Field Sample ID: G2SW0066

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	83900	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	72.0	P	50 - 300

Lab Sample ID: 2010273
Field Sample ID: G1SW0060

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	16.7	F	30 - 300
SOP-PCR-1.2	SKETA-qPCR	12.5	F	30 - 300
SOP-PCR-1.4	SKETA-qPCR	12.8	F	30 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	92.9						2.82	
	Chlorophyll-a, Uncorrected							0.613	
	Phaeophytin-a							6.15	
SOP-PCR-1.0	HF183-purified-qPCR	17.1	104	102					
	HF183-qPCR	133	108	107	91.1	104			13.0
				118					
SOP-PCR-1.2	GULL2-purified-qPCR	24.5	99.7	99.6					
SOP-PCR-1.3	GFD-purified-qPCR	61.0	117	35.4		102			
SOP-PCR-1.4	BacR-purified-qPCR	36.2	82.9	81.1					
	BacR-qPCR	117	169	57.7	80.6	77.8			3.22
				56.1					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 1603 / E84589	Escherichia coli by membrane filter	Advanced Environmental Laboratory in Tampa 2010299, 2010300, 2010301, 2010302, 2010303
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2010267
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2010268, 2010270, 2010272

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2010273
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2010273
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2010273
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2010268, 2010270, 2010272
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2010273
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2010268, 2010270, 2010271, 2010272, 2010273

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 1603	07/24/2018	07/24/2018 16:10		07/25/2018 15:45	AEL - Tampa	2010299, 2010300, 2010301, 2010302, 2010303
SM 10200 H (mod.)	07/25/2018	07/25/2018 15:00	Mariam Hanna	07/31/2018 08:15	Carina A. Tull	2010267
SOP-PCR-1.0	07/25/2018	07/25/2018 12:00	Mailin Lopez	08/31/2018 09:08	Mailin Lopez	2010273
	07/25/2018	07/25/2018 12:00	Puja Jasrotia	08/21/2018 14:26	Mailin Lopez	2010268, 2010270, 2010272
SOP-PCR-1.2	07/25/2018	07/25/2018 12:00	Mailin Lopez	09/04/2018 11:03	Sarah Menz	2010273
SOP-PCR-1.3	07/25/2018	07/25/2018 12:00	Mailin Lopez	09/04/2018 13:46	Sarah Menz	2010273
SOP-PCR-1.4	07/25/2018	07/25/2018 12:00	Mailin Lopez	08/31/2018 13:44	Mailin Lopez	2010273
	07/25/2018	07/25/2018 12:00	Puja Jasrotia	08/22/2018 10:28	Mailin Lopez	2010268, 2010270, 2010272
SOP-PCR-4.0	07/25/2018	07/25/2018 12:00	Angela Smith	08/20/2018 09:38	Sarah Menz	2010270, 2010271, 2010272, 2010273
	07/25/2018	07/25/2018 12:00	Sarah Menz	08/20/2018 09:38	Sarah Menz	2010268