

Biological Analysis Report

WQ-ASSESS-2017-05-02-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Wakulla, Moriah, Caney, Wards**

Request ID: **RQ-2017-05-01-28**

Customer: **WQ-ASSESS**

Project ID: **SMP**

Send Reports to:

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Division Of Water Facilities, FL DEP
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Date Certified: 01-JUN-2017 10:39



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, Microbiology and Molecular.

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: Wakulla River Below Highway 98 Bridge

Collection Date/Time: 05/01/2017 09:05

Field ID: G1WA0028_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895461	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.75	I	ug/L	P324896	
		Phaeophytin-a	1.4		ug/L	P324896	
		Chlorophyll/Phaeophytin Ratio	1.2			P324896	
		Chlorophyll-a, Uncorrected	1.7		ug/L	P324896	

Ref. Method and Comment:

SM 10200 H (mod.): Precision data is not available for at least one component due to the small amount of analyte in the QC sample. Refer to QA report for available precision data.

Sample Location: Wakulla River above US 98

Collection Date/Time: 05/02/2017 09:40

Field ID: G1WA0046_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895462	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.83	I	ug/L	P324896	
		Phaeophytin-a	1.3		ug/L	P324896	
		Chlorophyll/Phaeophytin Ratio	1.3			P324896	
		Chlorophyll-a, Uncorrected	1.7		ug/L	P324896	

Ref. Method and Comment:

SM 10200 H (mod.): Precision data is not available for at least one component due to the small amount of analyte in the QC sample. Refer to QA report for available precision data.

Sample Location: Moriah Creek 100 meters upstream of Newport Rd

Collection Date/Time: 05/02/2017 10:20

Field ID: G1WA0057_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895463	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.55	U	ug/L	P324896	
		Phaeophytin-a	0.40	U	ug/L	P324896	
		Chlorophyll/Phaeophytin Ratio	2.8			P324896	
		Chlorophyll-a, Uncorrected	0.40	U	ug/L	P324896	

Ref. Method and Comment:

SM 10200 H (mod.): Precision data is not available for at least one component due to the small amount of analyte in the QC sample. Refer to QA report for available precision data.

Sample Location: Caney Creek Upstream of US 90

Collection Date/Time: 05/02/2017 11:30

Field ID: G1WA0014_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895464	SM 10200 H (mod.)	Chlorophyll-a, Corrected	65		ug/L	P324896	
		Phaeophytin-a	11		ug/L	P324896	
		Chlorophyll/Phaeophytin Ratio	1.6			P324896	
		Chlorophyll-a, Uncorrected	74		ug/L	P324896	

Ref. Method and Comment:

SM 10200 H (mod.): Precision data is not available for at least one component due to the small amount of analyte in the QC sample. Refer to QA report for available precision data.

Sample Location: Caney Creek Downstream of 158A

Collection Date/Time: 05/02/2017 12:48

Field ID: G1WA0060_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Field ID: G1WA0060_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895465	SM 10200 H (mod.)	Chlorophyll-a, Corrected	70		ug/L	P324897	
		Phaeophytin-a	11		ug/L	P324897	
		Chlorophyll/Phaeophytin Ratio	1.6			P324897	
		Chlorophyll-a, Uncorrected	79		ug/L	P324897	

Sample Location: Caney Creek Upstream of US 90

Collection Date/Time: 05/02/2017 11:30

Field ID: G1WA0014_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895466	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	435.2		MPN/100 mL	P324834	RPD

Sample Location: Wards Creek upstream of bridge at CR 259

Collection Date/Time: 05/02/2017 12:10

Field ID: G1WA0002_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895467	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	461.1		MPN/100 mL	P324834	RPD

Sample Location: Caney Creek Downstream of 158A

Collection Date/Time: 05/02/2017 12:48

Field ID: G1WA0060_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895468	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	980.4		MPN/100 mL	P324834	RPD

Sample Location: Caney Creek Upstream of US 90

Collection Date/Time: 05/02/2017 11:30

Field ID: G1WA0014_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895469	SOP-PCR-1.0	HF183-qPCR**	44	T	GEU/100 mL	P324401	

Sample Location: Wards Creek upstream of bridge at CR 259

Collection Date/Time: 05/02/2017 12:10

Field ID: G1WA0002_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895470	SOP-PCR-1.0	HF183-qPCR**	27	T	GEU/100 mL	P324401	

Sample Location: Caney Creek Downstream of 158A

Collection Date/Time: 05/02/2017 12:48

Field ID: G1WA0060_05022017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1895471	SOP-PCR-1.0	HF183-qPCR**	29	IJ	GEU/100 mL	P324915	LCS, SUR

Ref. Method and Comment:
 SOP-PCR-1.0: Duplicate was analyzed and result is 18 TJ.

Quality Assurance Report

Method Blank Results

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P324896

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: SM 10200 H (mod.)
Batch ID: P324897

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: SM 9223 Quanti-Tray
Batch ID: P324834

Component	Result	Code	Units
Escherichia Coli-Quanti-Tray	1.0	U	MPN/100 mL

Reference Method: SOP-PCR-1.0
Batch ID: P324401

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

Reference Method: SOP-PCR-1.0
Batch ID: P324915

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P324896

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	98.8		P	84 - 116

Reference Method: SM 10200 H (mod.)
Batch ID: P324897

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	99.0		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P324401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	80.7	92.7	P/P	50 - 175

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P324915

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	87.5	20.9	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P324401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887856	HF183-qPCR	67.0		P	50 - 175
1888120	HF183-qPCR	88.4		P	50 - 175
1888121	HF183-qPCR	86.8		P	50 - 175
1888122	HF183-qPCR	83.5		P	50 - 175
1888123	HF183-qPCR	168		P	50 - 175
1888671	HF183-qPCR	89.3		P	50 - 175
1888808	HF183-qPCR	78.4		P	50 - 175
1888810	HF183-qPCR	87.5		P	50 - 175
1888886	HF183-qPCR	95.0		P	50 - 175
1895469	HF183-qPCR	107		P	50 - 175
1895470	HF183-qPCR	70.6		P	50 - 175

Reference Method: SOP-PCR-1.0

Batch ID: P324915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888809	HF183-qPCR	81.4		P	50 - 175
1893783	HF183-qPCR	74.5		P	50 - 175
1895471	HF183-qPCR	77.7	72.1	P/P	50 - 175
1895706	HF183-qPCR	82.7		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)

Batch ID: P324897

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1895606	Chlorophyll/Phaeophytin Ratio	0.0	Sample	P	0 - 25
1895606	Chlorophyll-a, Corrected	4.11	Sample	P	0 - 25
1895606	Chlorophyll-a, Uncorrected	3.59	Sample	P	0 - 25
1895606	Phaeophytin-a	2.40	Sample	P	0 - 25

Reference Method: SM 9223 Quanti-Tray

Batch ID: P324834

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1894866	Escherichia Coli-Quanti-Tray	83.0	Sample	F	0 - 80
1895192	Escherichia Coli-Quanti-Tray	19.6	Sample	P	0 - 80

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P324401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1895471	HF183-qPCR	21.8	Spike	P	0 - 25

Reference Method: SOP-PCR-1.0
 Batch ID: P324915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1895471	HF183-qPCR	7.43	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: 1895469
 Field Sample ID: G1WA0014_05022017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	59.2	P	50 - 300

Lab Sample ID: 1895470
 Field Sample ID: G1WA0002_05022017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	68.4	P	50 - 300

Lab Sample ID: 1895471
 Field Sample ID: G1WA0060_05022017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	26.2	F	30 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll/Phaeophytin Ratio							0.0	
	Chlorophyll-a, Corrected	98.8							
	Chlorophyll-a, Corrected	99.0						4.11	
	Chlorophyll-a, Uncorrected							3.59	
	Phaeophytin-a							2.40	
SM 9223 Quanti-Tray SOP-PCR-1.0	Escherichia Coli-Quanti-Tray							19.6	83.0
	HF183-qPCR	92.7	80.7	86.8	83.5	168			21.8
	HF183-qPCR			89.3					
		20.9	87.5	74.5	81.4	77.7			7.43
				72.1					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, phaeophytin and ratio by spectrophotometry	1895461, 1895462, 1895463, 1895464, 1895465
SM 9223 Quanti-Tray / E31780	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	1895466, 1895467, 1895468
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1895469, 1895470, 1895471

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	05/02/2017	05/02/2017 16:35	Morgan Lane	05/08/2017	Brian Cumbie	1895461, 1895462, 1895463, 1895464
	05/02/2017	05/02/2017 16:35	Morgan Lane	05/09/2017	Brian Cumbie	1895465
SM 9223 Quanti-Tray	05/02/2017	05/02/2017 16:05	Carina A. Tull	05/03/2017 10:25	Carina A. Tull	1895466, 1895467, 1895468
SOP-PCR-1.0	05/02/2017	05/03/2017 09:30	Avril Wood	05/08/2017	Puja Jasrotia	1895469, 1895470
	05/02/2017	05/03/2017 09:30	Puja Jasrotia	05/17/2017	Puja Jasrotia	1895471