

Biological Analysis Report

WQAP-2017-04-27-06

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

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

Event Description: **RUN 15**
Request ID: **RQ-2017-04-24-20**
Customer: **WQAP**
Project ID: **SMP**

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Certified by: Daisys Matthews,

Date Certified: 15-JUN-2017 15:32

A handwritten signature in black ink, appearing to read "D Matthews", with a stylized initial "D" and a long horizontal stroke.

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: GAP CRK

Collection Date/Time: 04/26/2017 09:30

Field ID: G2SW0030

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893552	SM 10200 H (mod.)	Chlorophyll-a, Corrected	43		ug/L	P324567	
		Phaeophytin-a	3.4		ug/L	P324567	
		Chlorophyll/Phaeophytin Ratio	1.6			P324567	
		Chlorophyll-a, Uncorrected	47		ug/L	P324567	

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: WARES CRK (FRESH)

Collection Date/Time: 04/26/2017 10:00

Field ID: G2SW0031

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893553	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.2		ug/L	P324567	
		Phaeophytin-a	1.5		ug/L	P324567	
		Chlorophyll/Phaeophytin Ratio	1.4			P324567	
		Chlorophyll-a, Uncorrected	3.2		ug/L	P324567	

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: RICE CRK

Collection Date/Time: 04/26/2017 14:50

Field ID: G2SW0032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893554	SM 10200 H (mod.)	Chlorophyll-a, Corrected	6.1		ug/L	P324567	
		Phaeophytin-a	0.83	I	ug/L	P324567	
		Chlorophyll/Phaeophytin Ratio	1.6			P324567	
		Chlorophyll-a, Uncorrected	6.8		ug/L	P324567	

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: GAP CRK

Collection Date/Time: 04/26/2017 09:30

Field ID: G2SW0030

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893555	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P325481	
	SOP-PCR-1.2	GULL2-qPCR**	1.1E+04	UJ	TSC/100 mL	P325481	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	110	UJ	TSC/100 mL	P325960	LCS, MS, RPD
	SOP-PCR-1.4	BacR-qPCR**	2.0E+03	U	TSC/100 mL	P325481	LCS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1893559	EPA 1603	Escherichia coli-Membrane Filter**	1040	B	cfu/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.0: No amplification of HF183 marker.
 SOP-PCR-1.2: No amplification of GULL2 marker. Quality control failure(s) observed. See QA report for details.
 SOP-PCR-1.3: No amplification of GFD marker. Quality control failure(s) observed. See QA report for details.
 SOP-PCR-1.4: No amplification of BACR marker.

Sample Location: WARES CRK (FRESH)

Collection Date/Time: 04/26/2017 10:00

Field ID: G2SW0031					Matrix: W-SURF-SLT		
Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893556	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1893560	EPA 1603	Escherichia coli-Membrane Filter**	240		cfu/100 mL		

Sample Location: LITTLE MANATEE river Collection Date/Time: 04/26/2017 12:40

Field ID: G2SW0023					Matrix: W-SURF-SLT		
Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893557	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P325481	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P325481	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	170	U	TSC/100 mL	P325960	LCS, MS, RPD
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P325481	LCS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1893561	EPA 1603	Escherichia coli-Membrane Filter**	5900		cfu/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.0: No amplification of HF183 marker.
 SOP-PCR-1.2: No amplification of GULL2 marker.
 SOP-PCR-1.3: No amplification of GFD marker.
 SOP-PCR-1.4: No amplification of BACR marker.

Sample Location: RICE CRK Collection Date/Time: 04/26/2017 14:50

Field ID: G2SW0032					Matrix: W-SURF-SLT		
Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1893558	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P325481	
	SOP-PCR-1.2	GULL2-qPCR**	5.6E+03	U	TSC/100 mL	P325481	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	110	U	TSC/100 mL	P325960	LCS, MS, RPD
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P325481	LCS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1893562	EPA 1603	Escherichia coli-Membrane Filter**	1180	B	cfu/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.0: No amplification of HF183 marker.
 SOP-PCR-1.2: No amplification of GULL2 marker.
 SOP-PCR-1.3: No amplification of GFD marker.
 SOP-PCR-1.4: No amplification of BACR marker.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
 Batch ID: P324567

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: P325481

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: P325481

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

Reference Method: SOP-PCR-1.2
Batch ID: P325481

Component	Result	Code	Units
GULL2-qPCR	1.7E+04	U	TSC/100 mL

Reference Method: SOP-PCR-1.3
Batch ID: P325960

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

Reference Method: SOP-PCR-1.4
Batch ID: P325481

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P324567

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	99.4		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P325481

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	66.9	91.8	P/P	50 - 175
HF183-qPCR	98.0	86.3	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P325481

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	92.7	107	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P325960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	118	30.9	P/F	50 - 175

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.4
 Batch ID: P325481

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	101	38.6	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
 Batch ID: P325481

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893555	HF183-qPCR	67.3		P	50 - 175
1893557	HF183-qPCR	79.4		P	50 - 175
1893558	HF183-qPCR	83.5		P	50 - 175
1894258	HF183-qPCR	73.7		P	50 - 175
1894305	HF183-qPCR	94.0		P	50 - 175
1894648	HF183-qPCR	66.5		P	50 - 175
1895705	HF183-qPCR	96.7		P	50 - 175
1896293	HF183-qPCR	94.3		P	50 - 175
1896294	HF183-qPCR	96.8		P	50 - 175
1897338	HF183-qPCR	86.0	88.9	P/P	50 - 175
1899957	HF183-qPCR	88.1		P	50 - 175
1899958	HF183-qPCR	84.6		P	50 - 175

Reference Method: SOP-PCR-1.2
 Batch ID: P325481

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893555	GULL2-qPCR	47.0		F	50 - 300
1893557	GULL2-qPCR	91.3		P	50 - 300
1893558	GULL2-qPCR	64.6		P	50 - 300
1894258	GULL2-qPCR	88.0		P	50 - 300
1894305	GULL2-qPCR	103		P	50 - 300
1895705	GULL2-qPCR	76.9		P	50 - 300

Reference Method: SOP-PCR-1.3
 Batch ID: P325960

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893555	GFD-purified-qPCR	0.0		F	50 - 175
1893557	GFD-purified-qPCR	140		P	50 - 175
1893558	GFD-purified-qPCR	141		P	50 - 175
1894258	GFD-purified-qPCR	17.6		F	50 - 175
1895705	GFD-purified-qPCR	100		P	50 - 175
1897242	GFD-purified-qPCR	0.0		F	50 - 175
1900677	GFD-purified-qPCR	3.84	5.47	F/F	50 - 175
1901185	GFD-purified-qPCR	61.6		P	50 - 175
1901186	GFD-purified-qPCR	27.7		F	50 - 175

Reference Method: SOP-PCR-1.4
 Batch ID: P325481

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

Reference Method: SOP-PCR-1.4
Batch ID: P325481

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1893555	BacR-qPCR	51.0		P	50 - 175
1893557	BacR-qPCR	57.6		P	50 - 175
1893558	BacR-qPCR	58.4		P	50 - 175
1894258	BacR-qPCR	61.0		P	50 - 175
1894305	BacR-qPCR	66.5		P	50 - 175
1895705	BacR-qPCR	58.8		P	50 - 175
1896294	BacR-qPCR	58.4		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P324567

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1893612	Chlorophyll/Phaeophytin Ratio	6.06	Sample	P	0 - 25
1893612	Chlorophyll-a, Corrected	2.13	Sample	P	0 - 25
1893612	Chlorophyll-a, Uncorrected	4.91	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P325481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1897338	HF183-qPCR	3.30	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P325481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1900677	GULL2-qPCR	19.7	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P325960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1900677	GFD-purified-qPCR	35.1	Spike	F	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P325481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1900677	BacR-qPCR	10.8	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: 1893555
Field Sample ID: G2SW0030

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	50.6	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	77.2	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	103	P	50 - 300

Lab Sample ID: 1893557
Field Sample ID: G2SW0023

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	122	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	115	P	50 - 300

Lab Sample ID: 1893558
Field Sample ID: G2SW0032

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	91.8	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	98.9	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery			MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll/Phaeophytin Ratio								6.06	
	Chlorophyll-a, Corrected	99.4							2.13	
	Chlorophyll-a, Uncorrected								4.91	
SOP-PCR-1.0	HF183-qPCR	66.9	86.3	98.0	84.6	67.3	79.4			3.30
		91.8			83.5					
SOP-PCR-1.2	GULL2-qPCR	107	92.7		91.3	64.6	88.0			19.7
					103					
SOP-PCR-1.3	GFD-purified-qPCR	30.9	118		0.0	140	141			35.1
					17.6					
SOP-PCR-1.4	BacR-qPCR	38.6	101		58.8	58.4	51.0			10.8
					57.6					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 1603 / E84589	Escherichia coli by membrane filter method using modified mTEC by Advanced Environmental Tampa Lab for SWD	1893559, 1893560, 1893561, 1893562
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, phaeophytin and ratio by spectrophotometry	1893552, 1893553, 1893554
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1893555, 1893557, 1893558
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium genetic marker with quantitative polymerase chain reaction	1893555, 1893557, 1893558
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter genetic marker with quantitative polymerase chain reaction	1893555, 1893557, 1893558
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes genetic marker with quantitative polymerase chain reaction	1893555, 1893557, 1893558

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	1893555, 1893556, 1893557, 1893558

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 1603	04/26/2017			04/26/2017 16:30	AEL - Tampa	1893559, 1893560, 1893561, 1893562
SM 10200 H (mod.)	04/27/2017	04/27/2017 13:55	Jennifer Mihalic	05/03/2017	Brian Cumbie	1893552, 1893553, 1893554
SOP-PCR-1.0	04/27/2017	04/27/2017 13:30	Puja Jasrotia	05/23/2017	Puja Jasrotia	1893558
	04/27/2017	04/27/2017 14:00	Puja Jasrotia	05/23/2017	Puja Jasrotia	1893555, 1893557
SOP-PCR-1.2	04/27/2017	04/27/2017 13:30	Puja Jasrotia	05/26/2017	Sarah Menz	1893558
	04/27/2017	04/27/2017 14:00	Puja Jasrotia	05/26/2017	Sarah Menz	1893555, 1893557
SOP-PCR-1.3	04/27/2017	04/27/2017 13:30	Sarah Menz	06/05/2017	Sarah Menz	1893558
	04/27/2017	04/27/2017 14:00	Sarah Menz	06/05/2017	Sarah Menz	1893555, 1893557
SOP-PCR-1.4	04/27/2017	04/27/2017 13:30	Puja Jasrotia	05/26/2017	Sarah Menz	1893558
	04/27/2017	04/27/2017 14:00	Puja Jasrotia	05/26/2017	Sarah Menz	1893555, 1893557
SOP-PCR-4.0	04/27/2017	04/27/2017 13:30	Avril Wood	05/12/2017	Puja Jasrotia	1893558
	04/27/2017	04/27/2017 14:00	Sarah Menz	05/12/2017	Puja Jasrotia	1893555, 1893556, 1893557