

Biological Analysis Report

SO-DIST-2018-05-10-01

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

Overflow Analyses Performed By:
Sanders Laboratories
10090 Bavaria Road
Ft. Myers, FL 33913
DOH Accreditation E85457

Event Description: **Wilderness Waterway**
Request ID: **RQ-2018-04-16-22**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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Date Certified: 25-OCT-2018 14:58



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: ENRE 11 at Huston Bay

Collection Date/Time: 05/09/2018 11:00

Field ID: G5SD0026

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1991759	SM 10200 H (mod.)	Chlorophyll-a, Corrected	3.6		ug/L	P345639	
		Phaeophytin-a	0.45	U	ug/L	P345639	
		Chlorophyll-a, Uncorrected	3.9		ug/L	P345639	
1991768	Enterolert/QT	ENTEROCOCCI-ENTEROLERT	10	U	MPN/100 mL		
	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray**	10	U	MPN/100 mL		

Sample Location: ENRE 9

Collection Date/Time: 05/09/2018 12:20

Field ID: G1SD0090

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1991760	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.2		ug/L	P345639	
		Phaeophytin-a	0.89	I	ug/L	P345639	
		Chlorophyll-a, Uncorrected	2.8		ug/L	P345639	
1991769	Enterolert/QT	ENTEROCOCCI-ENTEROLERT	179		MPN/100 mL		
	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray**	10	U	MPN/100 mL		

Sample Location: ENRE 9

Collection Date/Time: 05/09/2018 12:20

Field ID: G1SD0090

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1991767	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P346535	
	SOP-PCR-1.2	GULL2-purified-qPCR**	930	UJ	TSC/100 mL	P346882	LCS, SUR
	SOP-PCR-1.3	GFD-purified-qPCR**	210	I	TSC/100 mL	P346882	
	SOP-PCR-1.4	BacR-purified-qPCR**	170	UJ	TSC/100 mL	P346882	LCS, MS, SUR
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Ref. Method and Comment:

SOP-PCR-1.2: Quality control failure(s) observed. See QA report for details.

SOP-PCR-1.4: Quality control failure(s) observed. See QA report for details. Precision data unavailable for Analysis Batch A84700.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P345639

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: P346535

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

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.2
Batch ID: P346882

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

Reference Method: SOP-PCR-1.3
Batch ID: P346882

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

Reference Method: SOP-PCR-1.4
Batch ID: P346882

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: P345639

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	97.6		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P346535

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	121	145	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P346882

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-purified-qPCR	98.2	21.9	P/F	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P346882

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	82.1	65.0	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P346882

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-purified-qPCR	83.3	48.9	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P346535

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991767	HF183-qPCR	120	110	P	50 - 175
1995477	HF183-qPCR	112		P	50 - 175
1998500	HF183-qPCR	99.5		P/P	50 - 175
1998501	HF183-qPCR	110		P	50 - 175
1998502	HF183-qPCR	103	110	P	50 - 175
1998872	HF183-qPCR	93.3		P	50 - 175
1999081	HF183-qPCR	82.9		P	50 - 175
1999759	HF183-qPCR	72.5		P	50 - 175
1999760	HF183-qPCR	91.8		P	50 - 175
1999761	HF183-qPCR	86.9		P	50 - 175
1999762	HF183-qPCR	96.7		P	50 - 175
1999929	HF183-qPCR	105		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P346882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991767	GULL2-purified-qPCR	102	95.3	P	50 - 175
1995474	GULL2-purified-qPCR	99.0		P	50 - 300
1996836	GULL2-purified-qPCR	119		P	50 - 300
1997116	GULL2-purified-qPCR	102		P	50 - 300
1997120	GULL2-purified-qPCR	103		P	50 - 300
1997900	GULL2-purified-qPCR	102		P	50 - 300
1998501	GULL2-purified-qPCR	96.6		P	50 - 175
1999081	GULL2-purified-qPCR	102		P	50 - 300
1999759	GULL2-purified-qPCR	97.4		P	50 - 300
1999761	GULL2-purified-qPCR	103		P/P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P346882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991767	GFD-purified-qPCR	88.8	67.9	P	50 - 175
1992753	GFD-purified-qPCR	64.0		P	50 - 175
1992754	GFD-purified-qPCR	56.9		P/P	50 - 175
1992842	GFD-purified-qPCR	62.5		P	50 - 175
1995474	GFD-purified-qPCR	133		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P346882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991767	BacR-purified-qPCR	80.4	67.9	P	50 - 175
1995474	BacR-purified-qPCR	65.8		P	50 - 175
1997120	BacR-purified-qPCR	51.0		P	50 - 175
1997900	BacR-purified-qPCR	47.6		F	50 - 175

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P345639

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1991771	Chlorophyll-a, Corrected	4.57	Sample	P	0 - 25
1991771	Chlorophyll-a, Uncorrected	5.02	Sample	P	0 - 25
1991771	Phaeophytin-a	14.8	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P346535

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1998500	HF183-qPCR	9.69	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P346882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1999761	GULL2-purified-qPCR	7.62	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P346882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992754	GFD-purified-qPCR	7.40	Sample	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: 1991767
Field Sample ID: G1SD0090

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	85.3	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	12.1	F	30 - 300
SOP-PCR-1.4	SKETA-qPCR	13.2	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	97.6						4.57	
	Chlorophyll-a, Uncorrected							5.02	
	Phaeophytin-a							14.8	
	HF183-qPCR	145	121	112	72.5	91.8			9.69
				86.9					

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.2	GULL2-purified-qPCR	21.9	98.2	102	96.6	103			7.62
SOP-PCR-1.3	GFD-purified-qPCR	65.0	82.1	133	64.0	56.9		7.40	
SOP-PCR-1.4	BacR-purified-qPCR	48.9	83.3	51.0	65.8	47.6			
				95.3					
				67.9					
				80.4					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
Enterolert/QT / E85457	Enterococci by MPN method by Sanders Laboratories Overflow Laboratory for SD	1991768, 1991769
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	1991759, 1991760
SM 9223 Quanti-Tray / E85457	Escherichia coli by Colilert 18 Quanti-Tray method by Sanders Laboratories	1991768, 1991769
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1991767
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	1991767
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	1991767
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	1991767
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	1991767

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	05/09/2018	05/09/2018 17:00		05/10/2018 17:00	Sanders-Fort Myers	1991768, 1991769
SM 10200 H (mod.)	05/10/2018	05/10/2018 13:55	Edwin Gonzalez-Soto	05/18/2018 09:00	Carina A. Tull	1991759, 1991760
SM 9223 Quanti-Tray	05/09/2018	05/09/2018 15:30		05/10/2018 10:00	Sanders-Fort Myers	1991768, 1991769
SOP-PCR-1.0	05/10/2018	05/10/2018 14:25	Angela Smith	06/15/2018 08:33	Mailin Lopez	1991767
SOP-PCR-1.2	05/10/2018	05/10/2018 14:25	Sarah Menz	06/20/2018 08:54	Sarah Menz	1991767
SOP-PCR-1.3	05/10/2018	05/10/2018 14:25	Sarah Menz	06/20/2018 12:44	Sarah Menz	1991767
SOP-PCR-1.4	05/10/2018	05/10/2018 14:25	Sarah Menz	06/19/2018 13:50	Sarah Menz	1991767
SOP-PCR-4.0	05/10/2018	05/10/2018 14:25	Angela Smith	06/12/2018 12:42	Puja Jasrotia	1991767