

Biological Analysis Report

SE-DIST-2022-01-21-01

Florida Department of Environmental Protection
Central Laboratory
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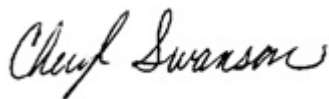
Event Description: **Palm Beach/Tidal Lox**
Request ID: **RQ-2022-01-17-33**
Customer: **SE-DIST**
Project ID: **SMP**

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Certified by: Cheryl A. Swanson, Program Administrator

Date Certified: 02-MAR-2022 11:01



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 by the Florida Department of Health Environmental Laboratory Certification Program 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: C-51 Forest Hill Blvd.

Collection Date/Time: 01/20/2022 10:30

Field ID: G3SE0057

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2300972	SM 10200 H (mod.)	Chlorophyll-a, Corrected	18		ug/L	P409156	
		Phaeophytin-a	3.4		ug/L	P409156	
		Chlorophyll-a, Uncorrected	21		ug/L	P409156	
2300975	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	32.3	Q	MPN/100 mL	P408964	

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: Lake Worth @ PGA Blvd.

Collection Date/Time: 01/20/2022 11:00

Field ID: G3SE0056

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2300973	SM 10200 H (mod.)	Chlorophyll-a, Corrected	3.9		ug/L	P409156	
		Phaeophytin-a	0.90	U	ug/L	P409156	
		Chlorophyll-a, Uncorrected	4.1		ug/L	P409156	

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: Tidal Creek to Lox

Collection Date/Time: 01/20/2022 11:50

Field ID: G2SE0027

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2300974	SM 10200 H (mod.)	Chlorophyll-a, Corrected	5.4		ug/L	P409156	
		Phaeophytin-a	0.98	U	ug/L	P409156	
		Chlorophyll-a, Uncorrected	6.0		ug/L	P409156	
2300976	Enterolert/QT	Enterococci-Quanti-Tray	31.0	Q	MPN/100 mL	P408964	
2300977	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P408621	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P408621	
	SOP-PCR-1.3	GFD-qPCR**	2.24E+04		TSC/100 mL	P408621	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P408621	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P408621	

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.

Quality Assurance Report Method Blank Results

Reference Method: Enterolert/QT

Batch ID: P408964

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

Reference Method: SM 10200 H (mod.)

Batch ID: P409156

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.82	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P409156

Component	Result	Code	Units
Chlorophyll-a, Uncorrected	0.60	U	ug/L
Phaeophytin-a	0.90	U	ug/L

Reference Method: SM 9223 B Quanti-Tray
Batch ID: P408964

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

Reference Method: SOP-PCR-1.0
Batch ID: P408621

Component	Result	Code	Units
HF183-qPCR	3.3E+03	U	TSC/100 mL

Reference Method: SOP-PCR-1.2
Batch ID: P408621

Component	Result	Code	Units
GULL2-qPCR	3.6E+03	U	TSC/100 mL

Reference Method: SOP-PCR-1.3
Batch ID: P408621

Component	Result	Code	Units
GFD-qPCR	720	U	TSC/100 mL

Reference Method: SOP-PCR-1.4
Batch ID: P408621

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

Reference Method: SOP-PCR-1.5
Batch ID: P408621

Component	Result	Code	Units
DG3-qPCR	2.6E+03	U	TSC/100 mL

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P409156

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	97.4		P	84 - 116

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P408621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	79.6	68.4	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P408621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	75.1	94.9	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P408621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	81.5	71.3	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P408621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	78.5	73.6	P/P	50 - 175
BacR-qPCR	78.5	73.6	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P408621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	80.1	85.9	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P408621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300068	HF183-qPCR	73.7		P	50 - 175
2300308	HF183-qPCR	76.6		P	50 - 175
2300309	HF183-qPCR	74.1		P	50 - 175
2300310	HF183-qPCR	86.0	78.7	P/P	50 - 175
2300311	HF183-qPCR	69.4		P	50 - 175
2300477	HF183-qPCR	73.9		P	50 - 175
2300698	HF183-qPCR	78.9		P	50 - 175
2300699	HF183-qPCR	72.8		P	50 - 175
2300891	HF183-qPCR	76.7		P	50 - 175
2300892	HF183-qPCR	73.3		P	50 - 175
2300977	HF183-qPCR	82.7		P	50 - 175
2301014	HF183-qPCR	72.6		P	50 - 175
2301272	HF183-qPCR	75.5		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P408621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300068	GULL2-qPCR	95.0	72.0	P	50 - 300
2300308	GULL2-qPCR	94.0		P	50 - 300
2300309	GULL2-qPCR	92.3		P	50 - 300
2300310	GULL2-qPCR	70.2		P/P	50 - 300
2300311	GULL2-qPCR	67.7		P	50 - 300
2300698	GULL2-qPCR	92.1		P	50 - 300
2300699	GULL2-qPCR	69.7		P	50 - 300
2300977	GULL2-qPCR	78.2		P	50 - 300
2301014	GULL2-qPCR	80.7		P	50 - 300
2301272	GULL2-qPCR	77.7		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P408621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300068	GFD-qPCR	110	114	P	50 - 175
2300308	GFD-qPCR	102		P	50 - 175
2300309	GFD-qPCR	101		P	50 - 175
2300310	GFD-qPCR	123		P/P	50 - 175
2300311	GFD-qPCR	111		P	50 - 175
2300698	GFD-qPCR	98.8		P	50 - 175
2300699	GFD-qPCR	101		P	50 - 175
2300977	GFD-qPCR	105		P	50 - 175
2301014	GFD-qPCR	84.7		P	50 - 175
2301272	GFD-qPCR	93.6		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P408621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300068	BacR-qPCR	57.0	57.0	P/P	50 - 175
2300308	BacR-qPCR	64.8	64.8	P/P	50 - 175
2300309	BacR-qPCR	71.5	71.5	P/P	50 - 175
2300310	BacR-qPCR	51.8	51.8	P/P	50 - 175
2300310	BacR-qPCR	53.2	53.2	P/P	50 - 175
2300311	BacR-qPCR	57.8	57.8	P/P	50 - 175
2300477	BacR-qPCR	68.9	68.9	P/P	50 - 175
2300698	BacR-qPCR	68.1	68.1	P/P	50 - 175
2300699	BacR-qPCR	59.3	59.3	P/P	50 - 175
2300891	BacR-qPCR	53.4	53.4	P/P	50 - 175
2300892	BacR-qPCR	52.1	52.1	P/P	50 - 175
2300977	BacR-qPCR	65.6	65.6	P/P	50 - 175
2301014	BacR-qPCR	50.7	50.7	P/P	50 - 175
2301272	BacR-qPCR	62.9	62.9	P/P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P408621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300068	DG3-qPCR	102		P	50 - 175
2300308	DG3-qPCR	93.1		P	50 - 175
2300309	DG3-qPCR	91.9		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P408621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300310	DG3-qPCR	107	106	P/P	50 - 175
2300311	DG3-qPCR	103		P	50 - 175
2300477	DG3-qPCR	90.1		P	50 - 175
2300698	DG3-qPCR	92.6		P	50 - 175
2300699	DG3-qPCR	103		P	50 - 175
2300891	DG3-qPCR	86.9		P	50 - 175
2300892	DG3-qPCR	87.1		P	50 - 175
2300977	DG3-qPCR	92.3		P	50 - 175
2301014	DG3-qPCR	86.8		P	50 - 175
2301272	DG3-qPCR	80.1		P	50 - 175

Quality Assurance Report Precision

Reference Method: Enterolert/QT
Batch ID: P408964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301161	Enterococci-Quanti-Tray	66.7	Sample	P	0 - 80

Reference Method: SM 10200 H (mod.)
Batch ID: P409156

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300957	Chlorophyll-a, Corrected	17.0	Sample	P	0 - 25
2300957	Chlorophyll-a, Uncorrected	17.6	Sample	P	0 - 25

Reference Method: SM 9223 B Quanti-Tray
Batch ID: P408964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301069	Escherichia Coli-Quanti-Tray	24.6	Sample	P	0 - 80
2301162	Escherichia Coli-Quanti-Tray	22.7	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0
Batch ID: P408621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300310	HF183-qPCR	8.87	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P408621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300310	GULL2-qPCR	2.57	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.3
Batch ID: P408621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300310	GFD-qPCR	7.36	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P408621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300310	BacR-qPCR	2.72	Spike	P	0 - 25
2300310	BacR-qPCR	2.72	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P408621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300310	DG3-qPCR	0.907	Spike	P	0 - 25

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Surrogates

Lab Sample ID: 2300977
Field Sample ID: G2SE0027

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	91.6	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	88.9	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	91.0	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	102	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	90.6	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
Enterolert/QT	Enterococci-Quanti-Tray							66.7	
SM 10200 H (mod.)	Chlorophyll-a, Corrected	97.4						17.0	
	Chlorophyll-a, Uncorrected							17.6	
SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray							24.6	22.7
SOP-PCR-1.0	HF183-qPCR	68.4	79.6	73.7	76.6	74.1			8.87
				86.0					
SOP-PCR-1.2	GULL2-qPCR	94.9	75.1	95.0	94.0	92.3			2.57
				70.2					
SOP-PCR-1.3	GFD-qPCR	71.3	81.5	110	102	101			7.36
				123					
SOP-PCR-1.4	BacR-qPCR	78.5	73.6	78.5	57.0	64.8	71.5		2.72
		73.6			51.8				2.72

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.5	DG3-qPCR	85.9	80.1	102	93.1	91.9	107		0.907

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
Enterolert/QT	Enterococci by Enterolert Quanti-Tray method - non-chlorinated water systems	2300976
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2300972, 2300973, 2300974
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2300975
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2300977
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2300977
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2300977
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2300977
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2300977

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	01/21/2022	01/21/2022 13:48	Caitlyn Owens	01/22/2022 13:59	Amber S. Eells	2300976
SM 10200 H (mod.)	01/21/2022	01/21/2022 14:36	Jillian G Hanley	01/28/2022 09:10	Joel Wharton	2300972, 2300973, 2300974
SM 9223 B Quanti-Tray	01/21/2022	01/21/2022 16:50	Caitlyn Owens	01/22/2022 13:35	Amber S. Eells	2300975
SOP-PCR-1.0	01/21/2022	01/21/2022 14:25	Luke Hudson	02/04/2022 11:18	DeAsia Armster	2300977
SOP-PCR-1.2	01/21/2022	01/21/2022 14:25	Luke Hudson	02/18/2022 09:17	DeAsia Armster	2300977
SOP-PCR-1.3	01/21/2022	01/21/2022 14:25	Luke Hudson	02/22/2022 09:35	DeAsia Armster	2300977
SOP-PCR-1.4	01/21/2022	01/21/2022 14:25	Luke Hudson	02/14/2022 09:14	DeAsia Armster	2300977
SOP-PCR-1.5	01/21/2022	01/21/2022 14:25	Luke Hudson	02/23/2022 09:46	DeAsia Armster	2300977