

Biological Analysis Report

SO-DIST-2022-03-15-01

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: **2022 SMP: Drains and Canals**
Request ID: **RQ-2022-03-14-49**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: William Mullen

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Certified by: Sarah Menz, Environmental Administrator

Date Certified: 22-APR-2022 13:56

A handwritten signature in dark ink, appearing to be 'Sarah Menz', written in a cursive style.

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 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: DRAINAGE DITCH @ CR 850

Collection Date/Time: 03/14/2022 09:05

Field ID: G1SD0061

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2312239	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P410938	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P410938	RPD
	SOP-PCR-1.3	GFD-qPCR**	3.0E+03		TSC/100 mL	P410938	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P410938	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P410938	
2312245	Colilert-18	Escherichia Coli-Quanti-Tray	167		MPN/100 mL		

Sample Location: TownsendCanalatChurchRd

Collection Date/Time: 03/14/2022 09:45

Field ID: G3SD0221

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2312225	SM 10200 H (mod.)	Chlorophyll-a, Corrected	28		ug/L	P411386	
		Phaeophytin-a	12		ug/L	P411386	
		Chlorophyll-a, Uncorrected	37		ug/L	P411386	
2312246	Colilert-18	Escherichia Coli-Quanti-Tray	108		MPN/100 mL		

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: C-139 Annex @ Deer Fence Canal Rd

Collection Date/Time: 03/14/2022 11:10

Field ID: G1SD0076

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2312226	SM 10200 H (mod.)	Chlorophyll-a, Corrected	8.8		ug/L	P411386	
		Phaeophytin-a	3.3		ug/L	P411386	
		Chlorophyll-a, Uncorrected	11		ug/L	P411386	
2312247	Colilert-18	Escherichia Coli-Quanti-Tray	77.1		MPN/100 mL		

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: SM 10200 H (mod.)

Batch ID: P411386

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.82	U	ug/L
Chlorophyll-a, Uncorrected	0.60	U	ug/L
Phaeophytin-a	0.90	U	ug/L

Reference Method: SOP-PCR-1.0

Batch ID: P410938

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

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.2
Batch ID: P410938

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

Reference Method: SOP-PCR-1.3
Batch ID: P410938

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

Reference Method: SOP-PCR-1.4
Batch ID: P410938

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

Reference Method: SOP-PCR-1.5
Batch ID: P410938

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: P411386

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	94.7		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P410938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	77.5	113	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P410938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	99.0	91.5	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P410938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	94.5	86.4	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P410938

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

Reference Method: SOP-PCR-1.4
Batch ID: P410938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	83.6	92.7	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P410938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	80.8	91.6	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P410938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2311763	HF183-qPCR	98.4	104	P/P	50 - 175
2311857	HF183-qPCR	97.0		P	50 - 175
2311858	HF183-qPCR	99.2		P	50 - 175
2311859	HF183-qPCR	102		P	50 - 175
2311860	HF183-qPCR	101		P	50 - 175
2312174	HF183-qPCR	122		P	50 - 175
2312222	HF183-qPCR	118		P	50 - 175
2312223	HF183-qPCR	91.6		P	50 - 175
2312224	HF183-qPCR	97.2		P	50 - 175
2312239	HF183-qPCR	101		P	50 - 175
2312447	HF183-qPCR	88.9		P	50 - 175
2312448	HF183-qPCR	111		P	50 - 175
2312449	HF183-qPCR	82.0		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P410938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2311763	GULL2-qPCR	63.9	46.0	P/F	50 - 300
2311857	GULL2-qPCR	56.0		P	50 - 300
2311860	GULL2-qPCR	75.7		P	50 - 300
2312174	GULL2-qPCR	96.4		P	50 - 300
2312222	GULL2-qPCR	90.9		P	50 - 300
2312223	GULL2-qPCR	62.1		P	50 - 300
2312239	GULL2-qPCR	68.9		P	50 - 300
2312447	GULL2-qPCR	74.8		P	50 - 300
2312448	GULL2-qPCR	79.3		P	50 - 300
2312449	GULL2-qPCR	67.8		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P410938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2311763	GFD-qPCR	94.8	102	P/P	50 - 175
2311857	GFD-qPCR	84.7		P	50 - 175
2311860	GFD-qPCR	109		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.3

Batch ID: P410938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2312174	GFD-qPCR	111		P	50 - 175
2312222	GFD-qPCR	103		P	50 - 175
2312223	GFD-qPCR	86.7		P	50 - 175
2312239	GFD-qPCR	96.1		P	50 - 175
2312447	GFD-qPCR	90.2		P	50 - 175
2312448	GFD-qPCR	94.8		P	50 - 175
2312449	GFD-qPCR	94.1		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P410938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2311763	BacR-qPCR	56.7	54.9	P/P	50 - 175
2311857	BacR-qPCR	50.6		P	50 - 175
2311858	BacR-qPCR	45.6		F	50 - 175
2311859	BacR-qPCR	57.3		P	50 - 175
2311860	BacR-qPCR	71.9		P	50 - 175
2312174	BacR-qPCR	97.2		P	50 - 175
2312222	BacR-qPCR	87.6		P	50 - 175
2312223	BacR-qPCR	77.3		P	50 - 175
2312224	BacR-qPCR	75.4		P	50 - 175
2312239	BacR-qPCR	90.5		P	50 - 175
2312447	BacR-qPCR	55.9		P	50 - 175
2312448	BacR-qPCR	86.6		P	50 - 175
2312449	BacR-qPCR	62.8		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P410938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2311763	DG3-qPCR	83.9	86.0	P/P	50 - 175
2311857	DG3-qPCR	67.1		P	50 - 175
2311858	DG3-qPCR	80.7		P	50 - 175
2311859	DG3-qPCR	71.8		P	50 - 175
2311860	DG3-qPCR	78.8		P	50 - 175
2312174	DG3-qPCR	92.0		P	50 - 175
2312222	DG3-qPCR	90.3		P	50 - 175
2312223	DG3-qPCR	70.4		P	50 - 175
2312224	DG3-qPCR	75.0		P	50 - 175
2312239	DG3-qPCR	87.4		P	50 - 175
2312447	DG3-qPCR	83.1		P	50 - 175
2312448	DG3-qPCR	87.2		P	50 - 175
2312449	DG3-qPCR	80.5		P	50 - 175

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
 Batch ID: P411386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2312351	Chlorophyll-a, Corrected	10.0	Sample	P	0 - 25
2312351	Chlorophyll-a, Uncorrected	10.1	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
 Batch ID: P410938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2311763	HF183-qPCR	5.20	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P410938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2311763	GULL2-qPCR	32.6	Spike	F	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P410938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2311763	GFD-qPCR	7.20	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P410938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2311763	BacR-qPCR	3.07	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
 Batch ID: P410938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2311763	DG3-qPCR	2.44	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2312239
 Field Sample ID: G1SD0061

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	78.9	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	92.0	P	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 2312239
 Field Sample ID: G1SD0061

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.3	SKETA-qPCR	85.6	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	80.1	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	80.3	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	94.7					10.0	
	Chlorophyll-a, Uncorrected						10.1	
SOP-PCR-1.0	HF183-qPCR	113	77.5	98.4	104	97.0		5.20
SOP-PCR-1.2	GULL2-qPCR	91.5	99.0	63.9	46.0	56.0		32.6
				75.7				
SOP-PCR-1.3	GFD-qPCR	86.4	94.5	94.8	102	84.7		7.20
				109				
SOP-PCR-1.4	BacR-qPCR	83.6	92.7	56.7	54.9	50.6		3.07
				45.6				
SOP-PCR-1.5	DG3-qPCR	91.6	80.8	83.9	86.0	67.1		2.44
				80.7				

Reference Method Descriptions

Method	Description	Associated Samples
Colilert-18	E. coli by Colilert-18/QT by Sanders in Fort Myers	2312245, 2312246, 2312247
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2312225, 2312226
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2312239
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2312239
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2312239
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2312239
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2312239

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Colilert-18	03/14/2022	03/14/2022 13:40		03/15/2022 11:00	Sanders-Fort Myers	2312245, 2312246, 2312247
SM 10200 H (mod.)	03/15/2022	03/15/2022 14:38	Joel Wharton	03/17/2022 15:12	Jillian G Hanley	2312225, 2312226
SOP-PCR-1.0	03/15/2022	03/15/2022 13:50	Roberta Tatti	04/14/2022 14:17	Roberta Tatti	2312239
SOP-PCR-1.2	03/15/2022	03/15/2022 13:50	Roberta Tatti	04/18/2022 11:49	Roberta Tatti	2312239
SOP-PCR-1.3	03/15/2022	03/15/2022 13:50	Roberta Tatti	04/18/2022 17:24	Roberta Tatti	2312239
SOP-PCR-1.4	03/15/2022	03/15/2022 13:50	Roberta Tatti	04/15/2022 09:33	Roberta Tatti	2312239
SOP-PCR-1.5	03/15/2022	03/15/2022 13:50	Roberta Tatti	04/18/2022 14:52	DeAsia Armster	2312239