Biological Analysis Report

SO-DIST-2022-03-31-01

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-2022-04-04-42**
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: Cheryl A. Swanson, Program Administrator

Date Certified: 11-MAY-2022 17:30

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: 03/30/2022 08:25**

Field ID: G1SD0061 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315652	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P411480	
	SOP-PCR-1.2	GULL2-qPCR**	2.4E+03	U	TSC/100 mL	P411480	
	SOP-PCR-1.3	GFD-qPCR**	820	I	TSC/100 mL	P411480	
	SOP-PCR-1.4	BacR-qPCR**	2.0E+03	U	TSC/100 mL	P411480	
	SOP-PCR-1.5	DG3-qPCR**	1.7E+03	U	TSC/100 mL	P411480	
2315653	Colilert-18	Escherichia Coli-Quanti-Tray	171		MPN/100 mL		

Sample Location: TownsendCanalatChurchRd **Collection Date/Time: 03/30/2022 08:50**

Field ID: G3SD0221 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315650	SM 10200 H (mod.)	Chlorophyll-a, Corrected	21		ug/L	P411954	
		Phaeophytin-a	11		ug/L	P411954	
		Chlorophyll-a, Uncorrected	28		ug/L	P411954	
2315654	Colilert-18	Escherichia Coli-Quanti-Tray	31.0		MPN/100 mL		

Sample Location: C-139 Annex @ Deer Fence Canal Rd **Collection Date/Time: 03/30/2022 10:15**

Field ID: G1SD0076 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2315651	SM 10200 H (mod.)	Chlorophyll-a, Corrected	22	A	ug/L	P411954	
		Phaeophytin-a	7.0	A	ug/L	P411954	
		Chlorophyll-a, Uncorrected	27	A	ug/L	P411954	
2315655	Colilert-18	Escherichia Coli-Quanti-Tray	20.0		MPN/100 mL		

Quality Assurance Report
Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P411954

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.89	U	ug/L
Chlorophyll-a, Uncorrected	0.65	U	ug/L
Phaeophytin-a	0.98	U	ug/L

Reference Method: SOP-PCR-1.0
Batch ID: P411480

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

Reference Method: SOP-PCR-1.2
Batch ID: P411480

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

Quality Assurance Report
Method Blank Results

Reference Method: SOP-PCR-1.3
Batch ID: P411480

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

Reference Method: SOP-PCR-1.4
Batch ID: P411480

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

Reference Method: SOP-PCR-1.5
Batch ID: P411480

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: P411954

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	93.5		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P411480

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	83.6	86.9	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P411480

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	53.7	95.3	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P411480

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	89.2	82.6	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P411480

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	80.4	69.9	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P411480

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P411480

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	74.7	67.5	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P411480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314088	HF183-qPCR	83.9		P	50 - 175
2314704	HF183-qPCR	85.3	89.6	P/P	50 - 175
2314705	HF183-qPCR	85.5		P	50 - 175
2314885	HF183-qPCR	77.3		P	50 - 175
2314886	HF183-qPCR	77.2		P	50 - 175
2314909	HF183-qPCR	85.6		P	50 - 175
2314931	HF183-qPCR	84.0		P	50 - 175
2315116	HF183-qPCR	76.5		P	50 - 175
2315305	HF183-qPCR	75.7		P	50 - 175
2315343	HF183-qPCR	87.2		P	50 - 175
2315344	HF183-qPCR	84.2		P	50 - 175
2315481	HF183-qPCR	79.1		P	50 - 175
2315652	HF183-qPCR	84.5		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P411480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314088	GULL2-qPCR	59.2		P	50 - 300
2314704	GULL2-qPCR	26.7	20.9	F/F	50 - 300
2314705	GULL2-qPCR	8.76		F	50 - 300
2314909	GULL2-qPCR	79.7		P	50 - 300
2314931	GULL2-qPCR	68.9		P	50 - 300
2315116	GULL2-qPCR	82.6		P	50 - 300
2315305	GULL2-qPCR	87.4		P	50 - 300
2315343	GULL2-qPCR	34.7		F	50 - 300
2315344	GULL2-qPCR	4.40		F	50 - 300
2315481	GULL2-qPCR	97.9		P	50 - 300
2315652	GULL2-qPCR	87.2		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P411480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314088	GFD-qPCR	99.4		P	50 - 175
2314704	GFD-qPCR	109	113	P/P	50 - 175
2314705	GFD-qPCR	108		P	50 - 175
2314909	GFD-qPCR	105		P	50 - 175
2314931	GFD-qPCR	86.5		P	50 - 175
2315116	GFD-qPCR	103		P	50 - 175
2315305	GFD-qPCR	90.4		P	50 - 175
2315343	GFD-qPCR	114		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.3
Batch ID: P411480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2315344	GFD-qPCR	104		P	50 - 175
2315481	GFD-qPCR	96.4		P	50 - 175
2315652	GFD-qPCR	98.2		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P411480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314088	BacR-qPCR	50.1		P	50 - 175
2314704	BacR-qPCR	50.8	52.3	P/P	50 - 175
2314705	BacR-qPCR	48.4		F	50 - 175
2314909	BacR-qPCR	63.8		P	50 - 175
2314931	BacR-qPCR	55.1		P	50 - 175
2315116	BacR-qPCR	67.6		P	50 - 175
2315305	BacR-qPCR	70.7		P	50 - 175
2315343	BacR-qPCR	49.8		F	50 - 175
2315344	BacR-qPCR	47.9		F	50 - 175
2315481	BacR-qPCR	74.7		P	50 - 175
2315652	BacR-qPCR	71.6		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P411480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314088	DG3-qPCR	69.7		P	50 - 175
2314704	DG3-qPCR	56.1	51.8	P/P	50 - 175
2314705	DG3-qPCR	50.3		P	50 - 175
2314909	DG3-qPCR	65.9		P	50 - 175
2314931	DG3-qPCR	74.1		P	50 - 175
2315116	DG3-qPCR	81.2		P	50 - 175
2315305	DG3-qPCR	74.1		P	50 - 175
2315343	DG3-qPCR	59.9		P	50 - 175
2315344	DG3-qPCR	42.5		F	50 - 175
2315481	DG3-qPCR	69.9		P	50 - 175
2315652	DG3-qPCR	80.7		P	50 - 175

Quality Assurance Report
Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P411954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2315651	Chlorophyll-a, Corrected	5.67	Sample	P	0 - 25
2315651	Chlorophyll-a, Uncorrected	5.93	Sample	P	0 - 25
2315651	Phaeophytin-a	7.45	Sample	P	0 - 25

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.0
Batch ID: P411480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314704	HF183-qPCR	4.91	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P411480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314704	GULL2-qPCR	24.4	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P411480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314704	GFD-qPCR	3.64	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P411480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314704	BacR-qPCR	2.90	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P411480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314704	DG3-qPCR	7.97	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2315652
Field Sample ID: G1SD0061

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	73.5	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	97.8	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	107	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	96.8	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	89.2	P	50 - 300

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision		
				LCS	SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	93.5			5.67	
	Chlorophyll-a, Uncorrected				5.93	
	Phaeophytin-a				7.45	
SOP-PCR-1.0	HF183-qPCR	86.9 83.6	85.3 89.6 83.9 85.5			4.91
SOP-PCR-1.2	GULL2-qPCR	95.3 53.7	26.7 20.9 59.2 8.76			24.4
SOP-PCR-1.3	GFD-qPCR	82.6 89.2	109 113 99.4 108			3.64
SOP-PCR-1.4	BacR-qPCR	69.9 80.4	50.8 52.3 50.1 48.4			2.90
SOP-PCR-1.5	DG3-qPCR	67.5 74.7	56.1 51.8 69.7 50.3			7.97

Reference Method Descriptions

Method	Description	Associated Samples
Colilert-18	E. coli by Colilert-18/QT by Sanders in Fort Myers	2315653, 2315654, 2315655
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2315650, 2315651
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2315652
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2315652
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2315652
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2315652
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2315652

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Colilert-18	03/30/2022	03/30/2022 15:35		03/31/2022 10:30	Sanders-Fort Myers	2315653, 2315654, 2315655
SM 10200 H (mod.)	03/31/2022	03/31/2022 15:09	Joel Wharton	04/04/2022 09:30	Jillian G Hanley	2315650, 2315651
SOP-PCR-1.0	03/31/2022	03/31/2022 13:20	Roberta Tatti	04/25/2022 11:52	Roberta Tatti	2315652
SOP-PCR-1.2	03/31/2022	03/31/2022 13:20	Roberta Tatti	04/28/2022 12:18	Roberta Tatti	2315652
SOP-PCR-1.3	03/31/2022	03/31/2022 13:20	Roberta Tatti	04/28/2022 15:32	Roberta Tatti	2315652
SOP-PCR-1.4	03/31/2022	03/31/2022 13:20	Roberta Tatti	04/27/2022 13:40	Roberta Tatti	2315652
SOP-PCR-1.5	03/31/2022	03/31/2022 13:20	Roberta Tatti	04/27/2022 14:45	Roberta Tatti	2315652