

Biological Analysis Report

SO-DIST-2021-04-16-02

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

Event Description: **2021 SMP: Lee County Sampling**

Request ID: **RQ-2021-04-12-69**

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: Chris Hormuth

For additional information please contact

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Certified by: Jacqueline Savage, Environmental Administrator

Date Certified: 20-MAY-2021 09:33

A handwritten signature in black ink that reads "Jackie Savage". The signature is written in a cursive, flowing 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 group are included in this report: 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: IOMIGRIO

Collection Date/Time: 04/15/2021 09:34

Field ID: IOMIGRIO

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2240274	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P396605	MS
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P396605	
	SOP-PCR-1.3	GFD-qPCR**	4.8E+03	A	TSC/100 mL	P396605	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P396605	LCS
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P396605	LCS

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
 Batch ID: P396605

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

Reference Method: SOP-PCR-1.2
 Batch ID: P396605

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

Reference Method: SOP-PCR-1.3
 Batch ID: P396605

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

Reference Method: SOP-PCR-1.4
 Batch ID: P396605

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

Reference Method: SOP-PCR-1.5
 Batch ID: P396605

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
 Batch ID: P396605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	63.3	99.5	P/P	50 - 175

Reference Method: SOP-PCR-1.2
 Batch ID: P396605

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

Reference Method: SOP-PCR-1.2
Batch ID: P396605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	86.9	104	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P396605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	86.8	105	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P396605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	77.6	31.5	P/F	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P396605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	83.9	14.9	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P396605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240114	HF183-qPCR	84.3	94.0	P	50 - 175
2240274	HF183-qPCR	87.9		P/P	50 - 175
2240285	HF183-qPCR	74.2		P	50 - 175
2240286	HF183-qPCR	80.9		P	50 - 175
2241115	HF183-qPCR	72.4		P	50 - 175
2241120	HF183-qPCR	82.0		P	50 - 175
2241344	HF183-qPCR	67.4		P	50 - 175
2241552	HF183-qPCR	76.4		P	50 - 175
2241553	HF183-qPCR	75.9		P	50 - 175
2241694	HF183-qPCR	74.8		P	50 - 175
2241695	HF183-qPCR	65.7		P	50 - 175
2241696	HF183-qPCR	41.8		F	50 - 175
2241697	HF183-qPCR	73.0		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P396605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240274	GULL2-qPCR	75.1	82.7	P/P	50 - 300
2240285	GULL2-qPCR	83.0		P	50 - 300
2240286	GULL2-qPCR	85.8		P	50 - 300
2241115	GULL2-qPCR	77.3		P	50 - 300
2241120	GULL2-qPCR	80.1		P	50 - 300
2241344	GULL2-qPCR	80.3		P	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P396605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241552	GULL2-qPCR	63.2		P	50 - 300
2241695	GULL2-qPCR	83.5		P	50 - 300
2241696	GULL2-qPCR	68.4		P	50 - 300
2241697	GULL2-qPCR	74.3		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P396605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240274	GFD-qPCR	90.9	97.8	P/P	50 - 175
2240285	GFD-qPCR	87.8		P	50 - 175
2240286	GFD-qPCR	96.1		P	50 - 175
2241115	GFD-qPCR	84.9		P	50 - 175
2241120	GFD-qPCR	88.8		P	50 - 175
2241344	GFD-qPCR	91.4		P	50 - 175
2241552	GFD-qPCR	96.0		P	50 - 175
2241695	GFD-qPCR	92.7		P	50 - 175
2241696	GFD-qPCR	86.4		P	50 - 175
2241697	GFD-qPCR	90.7		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P396605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240274	BacR-qPCR	87.8	77.0	P/P	50 - 175
2240285	BacR-qPCR	80.8		P	50 - 175
2240286	BacR-qPCR	109		P	50 - 175
2241115	BacR-qPCR	69.9		P	50 - 175
2241120	BacR-qPCR	88.4		P	50 - 175
2241344	BacR-qPCR	74.3		P	50 - 175
2241552	BacR-qPCR	91.7		P	50 - 175
2241553	BacR-qPCR	64.6		P	50 - 175
2241694	BacR-qPCR	73.2		P	50 - 175
2241695	BacR-qPCR	69.7		P	50 - 175
2241696	BacR-qPCR	65.2		P	50 - 175
2241697	BacR-qPCR	61.2		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P396605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240114	DG3-qPCR	75.8		P	50 - 175
2240274	DG3-qPCR	81.0	88.1	P/P	50 - 175
2240285	DG3-qPCR	102		P	50 - 175
2240286	DG3-qPCR	86.0		P	50 - 175
2241115	DG3-qPCR	85.0		P	50 - 175
2241120	DG3-qPCR	106		P	50 - 175
2241344	DG3-qPCR	80.9		P	50 - 175
2241552	DG3-qPCR	85.9		P	50 - 175
2241553	DG3-qPCR	90.8		P	50 - 175
2241694	DG3-qPCR	88.4		P	50 - 175
2241695	DG3-qPCR	83.2		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
 Batch ID: P396605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241696	DG3-qPCR	84.4		P	50 - 175
2241697	DG3-qPCR	86.4		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P396605

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240274	HF183-qPCR	6.69	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P396605

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240274	GULL2-qPCR	9.61	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P396605

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240274	GFD-qPCR	7.24	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P396605

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240274	BacR-qPCR	13.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
 Batch ID: P396605

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240274	DG3-qPCR	8.31	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2240274
 Field Sample ID: IOMIGRIO

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
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Quality Assurance Report Surrogates

Lab Sample ID: 2240274
Field Sample ID: IOMIGRIO

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	114	P	50 - 300
SOP-PCR-1.0	SKETA-qPCR	115	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	109	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	112	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	114	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	98.7	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	98.4	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	110	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	99.5	63.3	84.3	87.9	94.0			6.69
SOP-PCR-1.2	GULL2-qPCR	104	86.9	74.3	75.1	82.7			9.61
SOP-PCR-1.3	GFD-qPCR	105	86.8	90.9	97.8	87.8			7.24
SOP-PCR-1.4	BacR-qPCR	31.5	77.6	87.8	77.0	80.8			13.2
SOP-PCR-1.5	DG3-qPCR	14.9	83.9	75.8	81.0	88.1			8.31

Reference Method Descriptions

Method	Description	Associated Samples
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2240274
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2240274
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2240274
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2240274
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2240274

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SOP-PCR-1.0	04/16/2021	04/16/2021 13:15	DeAsia Armster	04/28/2021 11:22	DeAsia Armster	2240274
SOP-PCR-1.2	04/16/2021	04/16/2021 13:15	DeAsia Armster	05/04/2021 08:24	Mailin Lopez	2240274
SOP-PCR-1.3	04/16/2021	04/16/2021 13:15	DeAsia Armster	05/04/2021 10:57	Mailin Lopez	2240274
SOP-PCR-1.4	04/16/2021	04/16/2021 13:15	DeAsia Armster	05/03/2021 12:53	Mailin Lopez	2240274
SOP-PCR-1.5	04/16/2021	04/16/2021 13:15	DeAsia Armster	04/30/2021 08:21	Mailin Lopez	2240274