

Biological Analysis Report

SO-DIST-2021-04-22-01

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-2021-04-19-56**

Customer: **SO-DIST**

Project ID: **SMP**

Send Reports to:

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FLDEP South District Office
2295 Victoria Ave. Suite 364
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Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 26-MAY-2021 15:28

A handwritten signature in black ink, appearing to be 'Puja Jasrotia', with a horizontal line extending to the right.

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: IMPRGR51

Collection Date/Time: 04/21/2021 09:55

Field ID: IMPRGR51

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241706	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P396963	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P396963	MS
	SOP-PCR-1.3	GFD-qPCR**	2.6E+03	A	TSC/100 mL	P396963	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P396963	LCS
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P396963	LCS

Sample Location: IMPRGR41

Collection Date/Time: 04/21/2021 10:19

Field ID: IMPRGR41

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241707	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	UJ	TSC/100 mL	P396963	SUR
	SOP-PCR-1.2	GULL2-qPCR**	2.4E+03	U	TSC/100 mL	P396963	MS
	SOP-PCR-1.3	GFD-qPCR**	4.7E+03		TSC/100 mL	P396963	
	SOP-PCR-1.4	BacR-qPCR**	2.0E+03	U	TSC/100 mL	P396963	LCS
	SOP-PCR-1.5	DG3-qPCR**	1.7E+03	U	TSC/100 mL	P396963	LCS

Ref. Method and Comment:
 SOP-PCR-1.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: IMPRGR30

Collection Date/Time: 04/21/2021 10:43

Field ID: IMPRGR30

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241708	SOP-PCR-1.0	HF183-qPCR**	940	I	TSC/100 mL	P396963	
	SOP-PCR-1.4	BacR-qPCR**	760	U	TSC/100 mL	P396963	LCS
	SOP-PCR-1.5	DG3-qPCR**	640	U	TSC/100 mL	P396963	LCS

Sample Location: 47A-15GR

Collection Date/Time: 04/21/2021 09:20

Field ID: 47A-15GR

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241709	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P396963	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P396963	MS
	SOP-PCR-1.3	GFD-qPCR**	4.5E+03		TSC/100 mL	P396963	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P396963	LCS
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P396963	LCS

Sample Location: 47A-4GR

Collection Date/Time: 04/21/2021 09:39

Field ID: 47A-4GR

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241710	SOP-PCR-1.0	HF183-qPCR**	830	U	TSC/100 mL	P396963	
	SOP-PCR-1.2	GULL2-qPCR**	900	U	TSC/100 mL	P396963	MS
	SOP-PCR-1.3	GFD-qPCR**	9.61E+03		TSC/100 mL	P396963	
	SOP-PCR-1.4	BacR-qPCR**	760	U	TSC/100 mL	P396963	LCS
	SOP-PCR-1.5	DG3-qPCR**	640	U	TSC/100 mL	P396963	LCS

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
Batch ID: P396963

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

Reference Method: SOP-PCR-1.2
Batch ID: P396963

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

Reference Method: SOP-PCR-1.3
Batch ID: P396963

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

Reference Method: SOP-PCR-1.4
Batch ID: P396963

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: P396963

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: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	98.3	109	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	92.4	99.7	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	101	131	P/P	50 - 175

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	24.4	81.4	F/P	50 - 175
BacR-qPCR	20.7	84.4	F/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	83.6	25.2	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	HF183-qPCR	97.2	93.3	P/P	50 - 175
2241707	HF183-qPCR	85.0		P	50 - 175
2241708	HF183-qPCR	95.9		P	50 - 175
2241709	HF183-qPCR	86.0		P	50 - 175
2241710	HF183-qPCR	84.4		P	50 - 175
2242747	HF183-qPCR	72.7		P	50 - 175
2243049	HF183-qPCR	87.1		P	50 - 175
2243481	HF183-qPCR	74.3		P	50 - 175
2243991	HF183-qPCR	80.4		P	50 - 175
2243992	HF183-qPCR	78.8		P	50 - 175
2244081	HF183-qPCR	70.7		P	50 - 175
2244251	HF183-qPCR	81.1		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	GULL2-qPCR	64.6	72.3	P/P	50 - 300
2241707	GULL2-qPCR	88.5		P	50 - 300
2241709	GULL2-qPCR	87.7		P	50 - 300
2241710	GULL2-qPCR	74.6		P	50 - 300
2242747	GULL2-qPCR	72.2		P	50 - 300
2243481	GULL2-qPCR	32.7		F	50 - 300
2243991	GULL2-qPCR	88.4		P	50 - 300
2243992	GULL2-qPCR	80.2		P	50 - 300
2244251	GULL2-qPCR	77.0		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	GFD-qPCR	101	97.9	P/P	50 - 175
2241707	GFD-qPCR	98.9		P	50 - 175
2241709	GFD-qPCR	94.1		P	50 - 175
2241710	GFD-qPCR	90.0		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.3

Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2242747	GFD-qPCR	87.9		P	50 - 175
2243481	GFD-qPCR	82.5		P	50 - 175
2243991	GFD-qPCR	98.0		P	50 - 175
2243992	GFD-qPCR	83.4		P	50 - 175
2244081	GFD-qPCR	90.3		P	50 - 175
2244251	GFD-qPCR	90.5		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	BacR-qPCR	60.1	61.6	P/P	50 - 175
2241707	BacR-qPCR	70.2		P	50 - 175
2241708	BacR-qPCR	68.9		P	50 - 175
2241709	BacR-qPCR	67.5		P	50 - 175
2241710	BacR-qPCR	63.1		P	50 - 175
2242747	BacR-qPCR	56.9		P	50 - 175
2243049	BacR-qPCR	56.2		P	50 - 175
2243481	BacR-qPCR	76.2		P	50 - 175
2243991	BacR-qPCR	65.3		P	50 - 175
2243992	BacR-qPCR	60.8		P	50 - 175
2244081	BacR-qPCR	57.0		P	50 - 175
2244251	BacR-qPCR	63.3		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	DG3-qPCR	87.0	90.2	P/P	50 - 175
2241707	DG3-qPCR	84.8		P	50 - 175
2241708	DG3-qPCR	96.3		P	50 - 175
2241709	DG3-qPCR	84.6		P	50 - 175
2241710	DG3-qPCR	90.6		P	50 - 175
2242747	DG3-qPCR	77.1		P	50 - 175
2243049	DG3-qPCR	85.6		P	50 - 175
2243481	DG3-qPCR	77.5		P	50 - 175
2243991	DG3-qPCR	83.0		P	50 - 175
2243992	DG3-qPCR	105		P	50 - 175
2244251	DG3-qPCR	86.2		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0

Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	HF183-qPCR	4.14	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.2
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	GULL2-qPCR	11.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	GFD-qPCR	3.42	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	BacR-qPCR	10.3	Spike	P	0 - 25
2241706	BacR-qPCR	2.50	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	DG3-qPCR	3.57	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2241706
Field Sample ID: IMPRGR51

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	94.2	P	50 - 300
SOP-PCR-1.0	SKETA-qPCR	90.1	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	109	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	111	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	116	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	118	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	90.3	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	95.0	P	50 - 300

Lab Sample ID: 2241707
Field Sample ID: IMPRGR41

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	41.2	F	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 2241707
 Field Sample ID: IMPRGR41

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.2	SKETA-qPCR	108	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	127	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	133	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	103	P	50 - 300

Lab Sample ID: 2241708
 Field Sample ID: IMPRGR30

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	76.3	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	105	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	77.0	P	50 - 300

Lab Sample ID: 2241709
 Field Sample ID: 47A-15GR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	91.2	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	108	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	114	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	121	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	92.5	P	50 - 300

Lab Sample ID: 2241710
 Field Sample ID: 47A-4GR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	82.9	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	98.2	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	107	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	103	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	84.9	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	109	98.3	97.2	93.3	85.0		4.14
SOP-PCR-1.2	GULL2-qPCR	99.7	92.4	64.6	72.3	88.5		11.2
SOP-PCR-1.3	GFD-qPCR	131	101	101	97.9	98.9		3.42
SOP-PCR-1.4	BacR-qPCR	24.4	84.4	20.7	60.1	61.6	70.2	2.50 10.3
SOP-PCR-1.5	DG3-qPCR	25.2	83.6	87.0	90.2	84.8		3.57

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	2241706, 2241707, 2241708, 2241709, 2241710
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2241706, 2241707, 2241709, 2241710
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2241706, 2241707, 2241709, 2241710
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2241706, 2241707, 2241708, 2241709, 2241710
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2241706, 2241707, 2241708, 2241709, 2241710

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SOP-PCR-1.0	04/22/2021	04/22/2021 15:00	Mailin Lopez	05/05/2021 12:34	DeAsia Armster	2241706, 2241707, 2241708, 2241709, 2241710
SOP-PCR-1.2	04/22/2021	04/22/2021 15:00	Mailin Lopez	05/11/2021 14:54	Mailin Lopez	2241706, 2241707, 2241709, 2241710
SOP-PCR-1.3	04/22/2021	04/22/2021 15:00	Mailin Lopez	05/11/2021 12:21	DeAsia Armster	2241706, 2241707, 2241709, 2241710
SOP-PCR-1.4	04/22/2021	04/22/2021 15:00	Mailin Lopez	05/06/2021 12:09	DeAsia Armster	2241706, 2241707, 2241708, 2241709, 2241710
SOP-PCR-1.5	04/22/2021	04/22/2021 15:00	Mailin Lopez	05/07/2021 10:10	Mailin Lopez	2241706, 2241707, 2241708, 2241709, 2241710