

Biological Analysis Report

SO-DIST-2021-06-30-01

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-2021-06-14-49**

Customer: **SO-DIST**

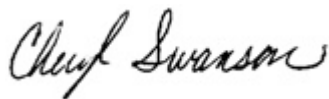
Project ID: **SMP**

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

For additional information please contact
Cheryl Swanson - Administrator
Jacqueline Savage - Bench Biology & Aquatic
Toxicity
Puja Jasrotia, Ph.D. - Molecular Biology & Taxonomy
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8177

Certified by: Cheryl A. Swanson, Program Administrator

Date Certified: 06-AUG-2021 11:57



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: 47A-15GR

Collection Date/Time: 06/29/2021 09:03

Field ID: 47A-15GR

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257983	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.3	GFD-qPCR**	4.0E+03		TSC/100 mL	P400109	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P400109	

Ref. Method and Comment:

SOP-PCR-1.2: Precision data unavailable for Gull2-qPCR component.

SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

Sample Location: 47A-4GR

Collection Date/Time: 06/29/2021 09:27

Field ID: 47A-4GR

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257984	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.3	GFD-qPCR**	8.4E+03		TSC/100 mL	P400109	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P400109	

Ref. Method and Comment:

SOP-PCR-1.2: Precision data unavailable for Gull2-qPCR component.

SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

Sample Location: IMPRGR51

Collection Date/Time: 06/29/2021 09:21

Field ID: IMPRGR51

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257985	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.3	GFD-qPCR**	3.0E+03		TSC/100 mL	P400109	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P400109	

Ref. Method and Comment:

SOP-PCR-1.2: Precision data unavailable for Gull2-qPCR component.

SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

Sample Location: IMPRGR41

Collection Date/Time: 06/29/2021 09:42

Field ID: IMPRGR41

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257986	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.3	GFD-qPCR**	1.2E+03	I	TSC/100 mL	P400109	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P400109	

Ref. Method and Comment:

SOP-PCR-1.2: Precision data unavailable for Gull2-qPCR component.

SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

Sample Location: IMPRGR30

Collection Date/Time: 06/29/2021 10:05

Field ID: IMPRGR30

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257987	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.2	GULL2-qPCR**	2.4E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.3	GFD-qPCR**	6.0E+03		TSC/100 mL	P400109	
	SOP-PCR-1.4	BacR-qPCR**	2.0E+03	U	TSC/100 mL	P400109	
	SOP-PCR-1.5	DG3-qPCR**	1.7E+03	U	TSC/100 mL	P400109	

Ref. Method and Comment:
SOP-PCR-1.2: Precision data unavailable for Gull2-qPCR component.
SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
Batch ID: P400109

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

Reference Method: SOP-PCR-1.2
Batch ID: P400109

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

Reference Method: SOP-PCR-1.3
Batch ID: P400109

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

Reference Method: SOP-PCR-1.4
Batch ID: P400109

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

Reference Method: SOP-PCR-1.5
Batch ID: P400109

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: P400109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	76.8	126	P/P	50 - 175

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.2
Batch ID: P400109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	87.9	105	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P400109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	73.1	106	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P400109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	85.5	59.9	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P400109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	132	130	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P400109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256760	HF183-qPCR	76.1	81.1	P/P	50 - 175
2256949	HF183-qPCR	77.4		P	50 - 175
2256950	HF183-qPCR	77.9		P	50 - 175
2257598	HF183-qPCR	57.9		P	50 - 175
2257599	HF183-qPCR	77.0		P	50 - 175
2257600	HF183-qPCR	69.0		P	50 - 175
2257601	HF183-qPCR	74.0		P	50 - 175
2257805	HF183-qPCR	65.6		P	50 - 175
2257983	HF183-qPCR	60.3		P	50 - 175
2257984	HF183-qPCR	59.1		P	50 - 175
2257985	HF183-qPCR	66.4		P	50 - 175
2257986	HF183-qPCR	57.7		P	50 - 175
2257987	HF183-qPCR	55.5		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P400109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256949	GULL2-qPCR	56.0		P	50 - 300
2256950	GULL2-qPCR	33.6		F	50 - 300
2257598	GULL2-qPCR	39.8		F	50 - 300
2257599	GULL2-qPCR	34.3		F	50 - 300
2257600	GULL2-qPCR	43.5		F	50 - 300
2257601	GULL2-qPCR	37.9		F	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P400109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257805	GULL2-qPCR	11.6		F	50 - 300
2257983	GULL2-qPCR	64.1		P	50 - 300
2257984	GULL2-qPCR	56.6		P	50 - 300
2257985	GULL2-qPCR	63.4		P	50 - 300
2257986	GULL2-qPCR	61.1		P	50 - 300
2257987	GULL2-qPCR	58.3		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P400109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256949	GFD-qPCR	80.2		P	50 - 175
2256950	GFD-qPCR	87.8		P	50 - 175
2257598	GFD-qPCR	65.8		P	50 - 175
2257599	GFD-qPCR	99.2		P	50 - 175
2257600	GFD-qPCR	85.3		P	50 - 175
2257601	GFD-qPCR	94.2		P	50 - 175
2257805	GFD-qPCR	81.3		P	50 - 175
2257983	GFD-qPCR	65.4		P	50 - 175
2257984	GFD-qPCR	84.4		P	50 - 175
2257985	GFD-qPCR	86.8		P	50 - 175
2257986	GFD-qPCR	85.1		P	50 - 175
2257987	GFD-qPCR	79.9		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P400109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256760	BacR-qPCR	54.6	46.8	P/F	50 - 175
2256949	BacR-qPCR	68.4		P	50 - 175
2256950	BacR-qPCR	61.3		P	50 - 175
2257598	BacR-qPCR	58.6		P	50 - 175
2257599	BacR-qPCR	60.4		P	50 - 175
2257600	BacR-qPCR	63.5		P	50 - 175
2257601	BacR-qPCR	58.7		P	50 - 175
2257805	BacR-qPCR	56.5		P	50 - 175
2257983	BacR-qPCR	53.8		P	50 - 175
2257984	BacR-qPCR	63.8		P	50 - 175
2257985	BacR-qPCR	73.1		P	50 - 175
2257986	BacR-qPCR	65.4		P	50 - 175
2257987	BacR-qPCR	73.7		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P400109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256760	DG3-qPCR	152	153	P/P	50 - 175
2256949	DG3-qPCR	149		P	50 - 175
2256950	DG3-qPCR	161		P	50 - 175
2257598	DG3-qPCR	139		P	50 - 175
2257599	DG3-qPCR	164		P	50 - 175
2257600	DG3-qPCR	155		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
 Batch ID: P400109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257601	DG3-qPCR	152		P	50 - 175
2257805	DG3-qPCR	140		P	50 - 175
2257983	DG3-qPCR	145		P	50 - 175
2257984	DG3-qPCR	136		P	50 - 175
2257985	DG3-qPCR	151		P	50 - 175
2257986	DG3-qPCR	137		P	50 - 175
2257987	DG3-qPCR	137		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P400109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256760	HF183-qPCR	6.32	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P400109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256760	BacR-qPCR	15.4	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
 Batch ID: P400109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256760	DG3-qPCR	0.821	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2257983
 Field Sample ID: 47A-15GR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	107	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	112	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	123	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	109	P	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 2257984
Field Sample ID: 47A-4GR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	109	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	114	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	125	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	107	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	111	P	50 - 300

Lab Sample ID: 2257985
Field Sample ID: IMPRGR51

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	108	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	118	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	109	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	106	P	50 - 300

Lab Sample ID: 2257986
Field Sample ID: IMPRGR41

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	121	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	120	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	102	P	50 - 300

Lab Sample ID: 2257987
Field Sample ID: IMPRGR30

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	69.0	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	130	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	98.5	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	112	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	126	76.8	76.1	81.1	77.4		6.32
SOP-PCR-1.2	GULL2-qPCR	105	87.9	56.0	33.6	39.8		
SOP-PCR-1.3	GFD-qPCR	106	73.1	80.2	87.8	65.8		
SOP-PCR-1.4	BacR-qPCR	59.9	85.5	54.6	46.8	68.4		15.4
SOP-PCR-1.5	DG3-qPCR	130	132	152	153	149		0.821

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	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2257983, 2257984, 2257985, 2257986, 2257987

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SOP-PCR-1.0	06/30/2021	06/30/2021 15:17	Amy M Gordon	07/06/2021 10:39	DeAsia Armster	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.2	06/30/2021	06/30/2021 15:17	Amy M Gordon	07/12/2021 14:22	DeAsia Armster	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.3	06/30/2021	06/30/2021 15:17	Amy M Gordon	07/13/2021 12:27	Mailin Lopez	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.4	06/30/2021	06/30/2021 15:17	Amy M Gordon	07/07/2021 12:00	DeAsia Armster	2257983, 2257984, 2257985, 2257986, 2257987
SOP-PCR-1.5	06/30/2021	06/30/2021 15:17	Amy M Gordon	07/07/2021 14:50	DeAsia Armster	2257983, 2257984, 2257985, 2257986, 2257987