Biological Analysis Report

CEN-DIST-2020-09-03-01

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

Event Description: **Boggy/Mills Creek**
Request ID: **RQ-2020-08-10-48**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Kalina Warren

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: 02-OCT-2020 11:51

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: Microbiology and 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: Boggy Creek @ 80m SE J Lawson Blvd. **Collection Date/Time: 09/02/2020 09:55**

Field ID: G4CE0181 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2194015	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	187.2	Q	MPN/100 mL	P387791	
2194016	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P386626	
	SOP-PCR-1.2	GULL2-qPCR**	1.1E+04	U	TSC/100 mL	P386626	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	110	U	TSC/100 mL	P387144	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P386626	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P386626	

Ref. Method and Comment:
SM 9223 Quanti-Tray: Precision data is unavailable due to the small amount of analyte in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: SM 9223 Quanti-Tray
Batch ID: P387791

Component	Result	Code	Units
Escherichia Coli-Quanti-Tray	1.0	U	MPN/100 mL

Reference Method: SOP-PCR-1.0
Batch ID: P386626

Component	Result	Code	Units
HF183-qPCR	280	U	GEU/100 mL

Reference Method: SOP-PCR-1.2
Batch ID: P386626

Component	Result	Code	Units
GULL2-qPCR	1.7E+04	U	TSC/100 mL

Reference Method: SOP-PCR-1.3
Batch ID: P387144

Component	Result	Code	Units
GFD-purified-qPCR	340	U	TSC/100 mL

Reference Method: SOP-PCR-1.4
Batch ID: P386626

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

Reference Method: SOP-PCR-1.5
Batch ID: P386626

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P386626

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	113	107	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P386626

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	96.1	110	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P387144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	90.1	6.04	P/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P386626

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	95.2	92.5	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P386626

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	89.6	98.0	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P386626

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192796	HF183-qPCR	107	109	P/P	50 - 175
2192797	HF183-qPCR	101		P	50 - 175
2192864	HF183-qPCR	108		P	50 - 175
2192865	HF183-qPCR	108		P	50 - 175
2193022	HF183-qPCR	88.7		P	50 - 175
2193023	HF183-qPCR	92.0		P	50 - 175
2193024	HF183-qPCR	100		P	50 - 175
2193347	HF183-qPCR	104		P	50 - 175
2193348	HF183-qPCR	77.2		P	50 - 175
2194016	HF183-qPCR	128		P	50 - 175
2194192	HF183-qPCR	109		P	50 - 175
2194193	HF183-qPCR	83.9		P	50 - 175
2194194	HF183-qPCR	70.2		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P386626

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2
Batch ID: P386626

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192796	GULL2-qPCR	83.3	81.7	P/P	50 - 300
2192797	GULL2-qPCR	85.6		P	50 - 300
2192864	GULL2-qPCR	53.4		P	50 - 300
2192865	GULL2-qPCR	76.4		P	50 - 300
2193347	GULL2-qPCR	83.1		P	50 - 300
2193348	GULL2-qPCR	19.9		F	50 - 300
2194016	GULL2-qPCR	82.2		P	50 - 300
2194193	GULL2-qPCR	73.9		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P387144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192796	GFD-purified-qPCR	127	120	P/P	50 - 175
2192797	GFD-purified-qPCR	99.3		P	50 - 175
2192864	GFD-purified-qPCR	33.7		F	50 - 175
2192865	GFD-purified-qPCR	72.7		P	50 - 175
2193347	GFD-purified-qPCR	84.3		P	50 - 175
2193348	GFD-purified-qPCR	79.8		P	50 - 175
2194016	GFD-purified-qPCR	113		P	50 - 175
2194193	GFD-purified-qPCR	39.8		F	50 - 175
2194437	GFD-purified-qPCR	115		P	50 - 175
2195672	GFD-purified-qPCR	92.9		P	50 - 175
2197429	GFD-purified-qPCR	67.0		P	50 - 175
2197581	GFD-purified-qPCR	91.6		P	50 - 175
2197653	GFD-purified-qPCR	88.8		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P386626

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192796	BacR-qPCR	80.9	84.0	P/P	50 - 175
2192797	BacR-qPCR	82.4		P	50 - 175
2192864	BacR-qPCR	60.1		P	50 - 175
2192865	BacR-qPCR	67.6		P	50 - 175
2193022	BacR-qPCR	67.0		P	50 - 175
2193023	BacR-qPCR	86.7		P	50 - 175
2193024	BacR-qPCR	80.6		P	50 - 175
2193347	BacR-qPCR	81.6		P	50 - 175
2193348	BacR-qPCR	67.9		P	50 - 175
2194016	BacR-qPCR	67.6		P	50 - 175
2194192	BacR-qPCR	86.2		P	50 - 175
2194193	BacR-qPCR	66.0		P	50 - 175
2194194	BacR-qPCR	78.7		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P386626

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192796	DG3-qPCR	86.6	88.4	P/P	50 - 175
2192797	DG3-qPCR	92.8		P	50 - 175
2192864	DG3-qPCR	76.3		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P386626

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192865	DG3-qPCR	109		P	50 - 175
2193022	DG3-qPCR	79.1		P	50 - 175
2193023	DG3-qPCR	84.5		P	50 - 175
2193024	DG3-qPCR	87.9		P	50 - 175
2193347	DG3-qPCR	85.3		P	50 - 175
2193348	DG3-qPCR	71.0		P	50 - 175
2194016	DG3-qPCR	82.8		P	50 - 175
2194192	DG3-qPCR	92.1		P	50 - 175
2194193	DG3-qPCR	87.7		P	50 - 175
2194194	DG3-qPCR	93.5		P	50 - 175

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.0
Batch ID: P386626

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192796	HF183-qPCR	1.80	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P386626

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192796	GULL2-qPCR	1.86	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P387144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192796	GFD-purified-qPCR	5.86	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P386626

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192796	BacR-qPCR	3.65	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P386626

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192796	DG3-qPCR	2.10	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2194016
Field Sample ID: G4CE0181

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	85.5	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	88.5	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	91.4	P	50 - 300

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision		
				LCS	SMP	MS
SOP-PCR-1.0	HF183-qPCR	107 113	107 109 101 108			1.80
SOP-PCR-1.2	GULL2-qPCR	110 96.1	83.3 81.7 85.6 53.4			1.86
SOP-PCR-1.3	GFD-purified-qPCR	6.04 90.1	127 120 99.3 33.7			5.86
SOP-PCR-1.4	BacR-qPCR	92.5 95.2	80.9 84.0 82.4 60.1			3.65
SOP-PCR-1.5	DG3-qPCR	98.0 89.6	86.6 88.4 92.8 76.3			2.10

Reference Method Descriptions

Method	Description	Associated Samples
SM 9223 Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2194015
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2194016
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2194016
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2194016
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2194016
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2194016

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 9223 Quanti-Tray	09/03/2020	09/03/2020 16:57	Carina A. Tull	09/04/2020 11:57	Jessica Fetgatter	2194015
SOP-PCR-1.0	09/03/2020	09/03/2020 15:15	Mailin Lopez	09/08/2020 13:01	Lauren Campbell	2194016
SOP-PCR-1.2	09/03/2020	09/03/2020 15:15	Mailin Lopez	09/10/2020 10:02	Mailin Lopez	2194016
SOP-PCR-1.3	09/03/2020	09/03/2020 15:15	Lauren Campbell	10/01/2020 15:58	Mailin Lopez	2194016
SOP-PCR-1.4	09/03/2020	09/03/2020 15:15	Mailin Lopez	09/09/2020 10:25	Lauren Campbell	2194016
SOP-PCR-1.5	09/03/2020	09/03/2020 15:15	Mailin Lopez	09/09/2020 11:48	Lauren Campbell	2194016