

Biological Analysis Report

CEN-DIST-2021-08-05-04

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

Event Description: **Reedy Creek (1685)**

Request ID: **RQ-2021-06-28-09**

Customer: **CEN-DIST**

Project ID: **SMP**

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Date Certified: 08-SEP-2021 16:16



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: Livingston Creek @ Rucks Dairy Rd

Collection Date/Time: 08/04/2021 13:05

Field ID: G4CE0194

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2267808	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	150.0	Q	MPN/100 mL	P402177	
2267809	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P401872	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P401872	
	SOP-PCR-1.3	GFD-qPCR**	570	I	TSC/100 mL	P401872	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P401872	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P401872	LCS

Quality Assurance Report Method Blank Results

Reference Method: SM 9223 Quanti-Tray
Batch ID: P402177

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

Reference Method: SOP-PCR-1.0
Batch ID: P401872

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

Reference Method: SOP-PCR-1.2
Batch ID: P401872

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

Reference Method: SOP-PCR-1.3
Batch ID: P401872

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

Reference Method: SOP-PCR-1.4
Batch ID: P401872

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

Reference Method: SOP-PCR-1.5
Batch ID: P401872

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: P401872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	75.8	87.7	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P401872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	99.0	87.4	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P401872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	111	82.7	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P401872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	83.3	86.2	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P401872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	77.7	242	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P401872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266515	HF183-qPCR	85.5	84.3	P/P	50 - 175
2266823	HF183-qPCR	88.6		P	50 - 175
2267095	HF183-qPCR	93.0		P	50 - 175
2267096	HF183-qPCR	75.9		P	50 - 175
2267104	HF183-qPCR	89.0		P	50 - 175
2267218	HF183-qPCR	85.2		P	50 - 175
2267219	HF183-qPCR	85.5		P	50 - 175
2267708	HF183-qPCR	89.4		P	50 - 175
2267809	HF183-qPCR	81.2		P	50 - 175
2268131	HF183-qPCR	81.3		P	50 - 175
2268132	HF183-qPCR	80.4		P	50 - 175
2268313	HF183-qPCR	87.7		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P401872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266515	GULL2-qPCR	71.0	79.1	P/P	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P401872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2267096	GULL2-qPCR	78.0		P	50 - 300
2267104	GULL2-qPCR	43.6		F	50 - 300
2267218	GULL2-qPCR	66.4		P	50 - 300
2267219	GULL2-qPCR	53.3		P	50 - 300
2267708	GULL2-qPCR	67.8		P	50 - 300
2267809	GULL2-qPCR	67.0		P	50 - 300
2268313	GULL2-qPCR	75.9		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P401872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266515	GFD-qPCR	98.6	109	P/P	50 - 175
2267096	GFD-qPCR	103		P	50 - 175
2267104	GFD-qPCR	107		P	50 - 175
2267218	GFD-qPCR	109		P	50 - 175
2267219	GFD-qPCR	115		P	50 - 175
2267708	GFD-qPCR	97.9		P	50 - 175
2267809	GFD-qPCR	95.2		P	50 - 175
2268313	GFD-qPCR	87.8		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P401872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266515	BacR-qPCR	71.4	67.6	P/P	50 - 175
2266823	BacR-qPCR	65.7		P	50 - 175
2267095	BacR-qPCR	62.8		P	50 - 175
2267096	BacR-qPCR	70.4		P	50 - 175
2267104	BacR-qPCR	50.8		P	50 - 175
2267218	BacR-qPCR	66.1		P	50 - 175
2267219	BacR-qPCR	75.9		P	50 - 175
2267708	BacR-qPCR	72.1		P	50 - 175
2267809	BacR-qPCR	64.1		P	50 - 175
2268131	BacR-qPCR	51.3		P	50 - 175
2268132	BacR-qPCR	51.2		P	50 - 175
2268313	BacR-qPCR	66.0		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P401872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266515	DG3-qPCR	78.5	67.9	P/P	50 - 175
2266823	DG3-qPCR	71.1		P	50 - 175
2267095	DG3-qPCR	37.3		F	50 - 175
2267096	DG3-qPCR	50.6		P	50 - 175
2267104	DG3-qPCR	55.0		P	50 - 175
2267218	DG3-qPCR	66.6		P	50 - 175
2267219	DG3-qPCR	59.2		P	50 - 175
2267708	DG3-qPCR	67.9		P	50 - 175
2267809	DG3-qPCR	51.2		P	50 - 175
2268131	DG3-qPCR	67.4		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
 Batch ID: P401872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268132	DG3-qPCR	63.1		P	50 - 175
2268313	DG3-qPCR	71.7		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 9223 Quanti-Tray
 Batch ID: P402177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2267670	Escherichia Coli-Quanti-Tray	8.16	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0
 Batch ID: P401872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266515	HF183-qPCR	1.39	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P401872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266515	GULL2-qPCR	10.8	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P401872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266515	GFD-qPCR	10.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P401872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266515	BacR-qPCR	5.42	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
 Batch ID: P401872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266515	DG3-qPCR	14.5	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2267809
 Field Sample ID: G4CE0194

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	94.1	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	107	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	95.6	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	96.1	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	99.2	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray							8.16	
SOP-PCR-1.0	HF183-qPCR	87.7	75.8	85.5	84.3	88.6			1.39
				93.0					
SOP-PCR-1.2	GULL2-qPCR	87.4	99.0	71.0	79.1	78.0			10.8
				43.6					
SOP-PCR-1.3	GFD-qPCR	82.7	111	98.6	109	103			10.2
				107					
SOP-PCR-1.4	BacR-qPCR	86.2	83.3	50.8	66.1	75.9			5.42
				72.1					
SOP-PCR-1.5	DG3-qPCR	242	77.7	78.5	67.9	71.1			14.5
				37.3					

Reference Method Descriptions

Method	Description	Associated Samples
SM 9223 Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2267808
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2267809
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2267809
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2267809
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2267809
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2267809

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 9223 Quanti-Tray	08/05/2021	08/05/2021 15:25	Amber S. Eells	08/06/2021 10:15	Carina A. Tull	2267808
SOP-PCR-1.0	08/05/2021	08/05/2021 14:10	Mailin Lopez	08/11/2021 12:38	DeAsia Armster	2267809
SOP-PCR-1.2	08/05/2021	08/05/2021 14:10	Mailin Lopez	08/17/2021 15:41	DeAsia Armster	2267809
SOP-PCR-1.3	08/05/2021	08/05/2021 14:10	Mailin Lopez	08/18/2021 08:53	Mailin Lopez	2267809
SOP-PCR-1.4	08/05/2021	08/05/2021 14:10	Mailin Lopez	08/12/2021 10:46	DeAsia Armster	2267809
SOP-PCR-1.5	08/05/2021	08/05/2021 14:10	Mailin Lopez	08/13/2021 10:35	DeAsia Armster	2267809