Biological Analysis Report

CEN-DIST-2021-07-16-02

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-2021-06-07-41**
Customer: **CEN-DIST**
Project ID: **SMP**

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Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 19-AUG-2021 14:48

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: 07/15/2021 12:45**

Field ID: G4CE0194 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2262770	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	143.9	Q	MPN/100 mL	P401524	
2262771	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P400964	
	SOP-PCR-1.2	GULL2-qPCR**	3.6E+03	U	TSC/100 mL	P400964	
	SOP-PCR-1.3	GFD-qPCR**	3.0E+03	I	TSC/100 mL	P400964	
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	U	TSC/100 mL	P400964	
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P400964	

Quality Assurance Report
Method Blank Results

Reference Method: SM 9223 Quanti-Tray
Batch ID: P401524

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

Reference Method: SOP-PCR-1.0
Batch ID: P400964

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

Reference Method: SOP-PCR-1.2
Batch ID: P400964

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

Reference Method: SOP-PCR-1.3
Batch ID: P400964

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

Reference Method: SOP-PCR-1.4
Batch ID: P400964

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

Reference Method: SOP-PCR-1.5
Batch ID: P400964

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: P400964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	99.8	82.6	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P400964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	105	109	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P400964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	97.6	112	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P400964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	89.8	127	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P400964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	58.5	100	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P400964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262194	HF183-qPCR	81.6		P	50 - 175
2262195	HF183-qPCR	84.3		P	50 - 175
2262290	HF183-qPCR	69.4	79.8	P/P	50 - 175
2262362	HF183-qPCR	71.6		P	50 - 175
2262399	HF183-qPCR	78.7		P	50 - 175
2262439	HF183-qPCR	74.4		P	50 - 175
2262598	HF183-qPCR	76.4		P	50 - 175
2262633	HF183-qPCR	67.5		P	50 - 175
2262634	HF183-qPCR	79.1		P	50 - 175
2262771	HF183-qPCR	57.6		P	50 - 175
2262791	HF183-qPCR	76.3		P	50 - 175
2263296	HF183-qPCR	81.9		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P400964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262194	GULL2-qPCR	68.6		P	50 - 300

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2
Batch ID: P400964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262195	GULL2-qPCR	75.0		P	50 - 300
2262290	GULL2-qPCR	102	83.9	P/P	50 - 300
2262362	GULL2-qPCR	53.8		P	50 - 300
2262439	GULL2-qPCR	62.8		P	50 - 300
2262598	GULL2-qPCR	74.5		P	50 - 300
2262633	GULL2-qPCR	61.7		P	50 - 300
2262634	GULL2-qPCR	71.2		P	50 - 300
2262771	GULL2-qPCR	71.3		P	50 - 300
2262791	GULL2-qPCR	66.1		P	50 - 300
2263296	GULL2-qPCR	67.1		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P400964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262194	GFD-qPCR	98.4		P	50 - 175
2262195	GFD-qPCR	98.1		P	50 - 175
2262290	GFD-qPCR	100	105	P/P	50 - 175
2262362	GFD-qPCR	91.0		P	50 - 175
2262439	GFD-qPCR	88.2		P	50 - 175
2262598	GFD-qPCR	96.9		P	50 - 175
2262633	GFD-qPCR	97.0		P	50 - 175
2262634	GFD-qPCR	99.5		P	50 - 175
2262771	GFD-qPCR	93.9		P	50 - 175
2262791	GFD-qPCR	88.5		P	50 - 175
2263296	GFD-qPCR	94.4		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P400964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262194	BacR-qPCR	75.6		P	50 - 175
2262195	BacR-qPCR	71.7		P	50 - 175
2262290	BacR-qPCR	74.5	79.6	P/P	50 - 175
2262362	BacR-qPCR	60.2		P	50 - 175
2262399	BacR-qPCR	74.0		P	50 - 175
2262439	BacR-qPCR	56.9		P	50 - 175
2262598	BacR-qPCR	72.9		P	50 - 175
2262633	BacR-qPCR	64.7		P	50 - 175
2262634	BacR-qPCR	62.9		P	50 - 175
2262771	BacR-qPCR	63.1		P	50 - 175
2262791	BacR-qPCR	64.4		P	50 - 175
2263296	BacR-qPCR	64.8		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P400964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262194	DG3-qPCR	77.3		P	50 - 175
2262195	DG3-qPCR	75.5		P	50 - 175
2262290	DG3-qPCR	75.5	73.5	P/P	50 - 175
2262362	DG3-qPCR	66.8		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P400964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262399	DG3-qPCR	82.8		P	50 - 175
2262439	DG3-qPCR	72.9		P	50 - 175
2262598	DG3-qPCR	71.6		P	50 - 175
2262633	DG3-qPCR	76.9		P	50 - 175
2262634	DG3-qPCR	69.6		P	50 - 175
2262771	DG3-qPCR	71.0		P	50 - 175
2262791	DG3-qPCR	71.5		P	50 - 175
2263296	DG3-qPCR	59.5		P	50 - 175

Quality Assurance Report
Precision

Reference Method: SM 9223 Quanti-Tray
Batch ID: P401524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262854	Escherichia Coli-Quanti-Tray	23.2	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0
Batch ID: P400964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262290	HF183-qPCR	13.9	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P400964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262290	GULL2-qPCR	19.9	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P400964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262290	GFD-qPCR	5.34	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P400964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262290	BacR-qPCR	6.69	Spike	P	0 - 25

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.5
Batch ID: P400964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262290	DG3-qPCR	2.68	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2262771
Field Sample ID: G4CE0194

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	84.1	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	117	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	152	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	104	P	50 - 300

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision		
				LCS	SMP	MS
SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray				23.2	
SOP-PCR-1.0	HF183-qPCR	82.6 99.8	81.6 84.3 69.4 79.8			13.9
SOP-PCR-1.2	GULL2-qPCR	109 105	68.6 75.0 102 83.9			19.9
SOP-PCR-1.3	GFD-qPCR	112 97.6	98.4 98.1 100 105			5.34
SOP-PCR-1.4	BacR-qPCR	127 89.8	75.6 71.7 74.5 79.6			6.69
SOP-PCR-1.5	DG3-qPCR	100 58.5	77.3 75.5 75.5 73.5			2.68

Reference Method Descriptions

Method	Description	Associated Samples
SM 9223 Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2262770
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2262771
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2262771
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2262771
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2262771
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2262771

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 9223 Quanti-Tray	07/16/2021	07/16/2021 17:00	Jessica Fetgatter	07/17/2021 14:10	Carina A. Tull	2262770
SOP-PCR-1.0	07/16/2021	07/16/2021 14:35	Amy M Gordon	07/23/2021 11:16	DeAsia Armster	2262771
SOP-PCR-1.2	07/16/2021	07/16/2021 14:35	Amy M Gordon	07/28/2021 12:12	Mailin Lopez	2262771
SOP-PCR-1.3	07/16/2021	07/16/2021 14:35	Amy M Gordon	07/28/2021 14:38	Mailin Lopez	2262771
SOP-PCR-1.4	07/16/2021	07/16/2021 14:35	Amy M Gordon	07/26/2021 10:29	DeAsia Armster	2262771
SOP-PCR-1.5	07/16/2021	07/16/2021 14:35	Amy M Gordon	07/27/2021 11:54	DeAsia Armster	2262771