

Biological Analysis Report

TLH-ROC-2019-05-01-02

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

Event Description: **Lexington Creek**
Request ID: **RQ-2019-04-29-39**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
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Certified by: Jacqueline Savage, Environmental Administrator

Date Certified: 24-MAY-2019 15:18

A handwritten signature in black ink that reads "Jackie Savage". The signature is written in a cursive, flowing style.

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: Lexington Creek @ Timberlane Rd

Collection Date/Time: 05/01/2019 09:00

Field ID: G1TLHR0088

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2082290	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	3053.0	A	MPN/100 mL	P363484	
2082296	SOP-PCR-1.0	HF183-qPCR**	2.33E+03		GEU/100 mL	P362909	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P363169	

Sample Location: Unnamed Branch @ John Hancock Dr.

Collection Date/Time: 05/01/2019 09:10

Field ID: G1TLHR0105

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2082291	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	920.8		MPN/100 mL	P363484	
2082297	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P362909	
	SOP-PCR-1.2	GULL2-qPCR**	1.7E+04	U	TSC/100 mL	P362909	
	SOP-PCR-1.3	GFD-purified-qPCR**	2.27E+03	J	TSC/100 mL	P363659	MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P362909	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P363169	

Ref. Method and Comment:

SOP-PCR-1.2: Precision data unavailable for Analysis Batch A91445.

SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Sample Location: Lexington Creek @ Donation Staton

Collection Date/Time: 05/01/2019 09:25

Field ID: G1TLHR0106

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2082292	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	204.6		MPN/100 mL	P363484	
2082298	SOP-PCR-1.0	HF183-qPCR**	380	I	GEU/100 mL	P362909	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold			P363169	

Sample Location: Lexington Creek @ Powerline

Collection Date/Time: 05/01/2019 09:40

Field ID: G1TLHR0107

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2082293	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	88.2		MPN/100 mL	P363484	
2082299	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P362909	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold			P363169	

Sample Location: Unnamed Branch @ Lakeshore Dr.

Collection Date/Time: 05/01/2019 10:25

Field ID: G1TLHR0108

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2082294	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	816.4		MPN/100 mL	P363484	
2082300	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P362909	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P362909	
	SOP-PCR-1.3	GFD-purified-qPCR**	8.62E+04	J	TSC/100 mL	P363659	MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P362909	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P363169	

Ref. Method and Comment:

SOP-PCR-1.2: Precision data unavailable for Analysis Batch A91445.

SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Quality Assurance Report Method Blank Results

Reference Method: SM 9223 Quanti-Tray
Batch ID: P363484

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

Reference Method: SOP-PCR-1.0
Batch ID: P362909

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

Reference Method: SOP-PCR-1.2
Batch ID: P362909

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

Reference Method: SOP-PCR-1.3
Batch ID: P363659

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

Reference Method: SOP-PCR-1.4
Batch ID: P362909

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P362909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	116	113	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P362909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	97.4	84.1	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P363659

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	158	92.5	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P362909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P362909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	91.8	81.3	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P362909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2081377	HF183-qPCR	92.3		P	50 - 175
2081378	HF183-qPCR	86.2		P	50 - 175
2081891	HF183-qPCR	81.5		P	50 - 175
2081892	HF183-qPCR	79.6		P	50 - 175
2082147	HF183-qPCR	89.4	87.2	P/P	50 - 175
2082296	HF183-qPCR	94.4		P	50 - 175
2082297	HF183-qPCR	78.0		P	50 - 175
2082298	HF183-qPCR	125		P	50 - 175
2082299	HF183-qPCR	99.5		P	50 - 175
2082300	HF183-qPCR	89.8		P	50 - 175
2082368	HF183-qPCR	78.2		P	50 - 175
2082369	HF183-qPCR	75.2		P	50 - 175
2082370	HF183-qPCR	88.2		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P362909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2081377	GULL2-qPCR	87.1		P	50 - 300
2081378	GULL2-qPCR	74.2		P	50 - 300
2082297	GULL2-qPCR	83.1		P	50 - 300
2082300	GULL2-qPCR	72.2		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P363659

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076372	GFD-purified-qPCR	921		F	50 - 175
2078231	GFD-purified-qPCR	855		F	50 - 175
2082297	GFD-purified-qPCR	447		F	50 - 175
2082300	GFD-purified-qPCR	681		F	50 - 175
2084684	GFD-purified-qPCR	1120		F	50 - 175
2084685	GFD-purified-qPCR	1330		F	50 - 175
2084686	GFD-purified-qPCR	1040	1010	F/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P362909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2081891	BacR-qPCR	58.4		P	50 - 175
2081892	BacR-qPCR	70.3		P	50 - 175
2082147	BacR-qPCR	68.7	71.0	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
 Batch ID: P362909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2082297	BacR-qPCR	70.8		P	50 - 175
2082300	BacR-qPCR	80.4		P	50 - 175
2082368	BacR-qPCR	62.8		P	50 - 175
2082369	BacR-qPCR	64.3		P	50 - 175
2082370	BacR-qPCR	75.3		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 9223 Quanti-Tray
 Batch ID: P363484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2081972	Escherichia Coli-Quanti-Tray	40.0	Sample	P	0 - 80
2082011	Escherichia Coli-Quanti-Tray	14.9	Sample	P	0 - 80
2082290	Escherichia Coli-Quanti-Tray	13.2	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0
 Batch ID: P362909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2082147	HF183-qPCR	2.52	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P363659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084686	GFD-purified-qPCR	3.56	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P362909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2082147	BacR-qPCR	3.32	Spike	P	0 - 25

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
 Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Surrogates

Lab Sample ID: 2082296
 Field Sample ID: G1TLHR0088

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	104	P	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 2082297
Field Sample ID: G1TLHR0105

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	66.2	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	67.8	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	66.6	P	50 - 300

Lab Sample ID: 2082298
Field Sample ID: G1TLHR0106

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	101	P	50 - 300

Lab Sample ID: 2082299
Field Sample ID: G1TLHR0107

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	96.0	P	50 - 300

Lab Sample ID: 2082300
Field Sample ID: G1TLHR0108

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	91.0	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	92.0	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	97.7	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							40.0 14.9 13.2	
SOP-PCR-1.0	HF183-qPCR	113	116	81.5 79.6 89.4 87.2					2.52
SOP-PCR-1.2	GULL2-qPCR	84.1	97.4	83.1 72.2 87.1 74.2					
SOP-PCR-1.3	GFD-purified-qPCR	92.5	158	1120 1330 1040 1010					3.56
SOP-PCR-1.4	BacR-qPCR	81.3	91.8	58.4 70.3 68.7 71.0					3.32

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 9223 Quanti-Tray / E31780	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2082290, 2082291, 2082292, 2082293, 2082294
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2082296, 2082297, 2082298, 2082299, 2082300
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2082297, 2082300
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2082297, 2082300

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2082297, 2082300
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2082296, 2082297, 2082298, 2082299, 2082300

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 9223 Quanti-Tray	05/01/2019	05/01/2019 16:41	Edwin Gonzalez-Soto	05/02/2019 10:45	Edwin Gonzalez-Soto	2082290, 2082291, 2082292, 2082293, 2082294
SOP-PCR-1.0	05/01/2019	05/02/2019 09:30	Angela Smith	05/09/2019 11:17	Sarah Menz	2082296, 2082297, 2082298, 2082299, 2082300
SOP-PCR-1.2	05/01/2019	05/02/2019 09:30	Angela Smith	05/15/2019 10:25	Sarah Menz	2082297, 2082300
SOP-PCR-1.3	05/01/2019	05/02/2019 09:30	Angela Smith	05/17/2019 09:40	Sarah Menz	2082297, 2082300
SOP-PCR-1.4	05/01/2019	05/02/2019 09:30	Angela Smith	05/13/2019 14:57	Sarah Menz	2082297, 2082300
SOP-PCR-4.0	05/01/2019	05/02/2019 09:30	Angela Smith	05/13/2019 08:33	Sarah Menz	2082296, 2082297, 2082298, 2082299, 2082300