

Biological Analysis Report

SO-DIST-2020-03-03-01

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

Overflow Analyses Performed By:
Sanders Laboratories
10090 Bavaria Road
Ft. Myers, FL 33913
DOH Accreditation E85457

Event Description: **SMP: Caloosa Creeks Sites**
Request ID: **RQ-2020-03-02-16**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
2295 Victoria Ave. Suite 364
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Certified by: Cheryl A. Swanson, Program Administrator

Date Certified: 25-MAR-2020 15:27



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: Molecular and Overflow.

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: Telegraph Creek

Collection Date/Time: 03/02/2020 09:40

Field ID: G3SD0129

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2161357	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P379866	
	SOP-PCR-1.4	BacR-qPCR**	1.44E+04		TSC/100 mL	P379866	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P379866	
2161359	Colilert-18	Escherichia Coli-Quanti-Tray	52.0		MPN/100 mL		

Sample Location: Orange River

Collection Date/Time: 03/02/2020 10:25

Field ID: G3SD0128

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2161358	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P379866	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P379866	
	SOP-PCR-1.3	GFD-purified-qPCR**	170	U	TSC/100 mL	P380834	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P379866	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P379866	
2161360	Colilert-18	Escherichia Coli-Quanti-Tray	20.0		MPN/100 mL		

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0

Batch ID: P379866

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

Reference Method: SOP-PCR-1.2

Batch ID: P379866

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

Reference Method: SOP-PCR-1.3

Batch ID: P380834

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

Reference Method: SOP-PCR-1.4

Batch ID: P379866

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

Reference Method: SOP-PCR-1.5

Batch ID: P379866

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: P379866

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	116	109	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P379866

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	99.1	139	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P380834

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	89.6	21.3	P/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P379866

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	99.7	121	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P379866

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	96.4	86.4	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P379866

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161208	HF183-qPCR	112		P	50 - 175
2161209	HF183-qPCR	109		P	50 - 175
2161357	HF183-qPCR	99.0		P	50 - 175
2161358	HF183-qPCR	118	118	P/P	50 - 175
2161748	HF183-qPCR	110		P	50 - 175
2161864	HF183-qPCR	91.5		P	50 - 175
2161865	HF183-qPCR	89.9		P	50 - 175
2161866	HF183-qPCR	86.9		P	50 - 175
2163117	HF183-qPCR	117		P	50 - 175
2163118	HF183-qPCR	103		P	50 - 175
2163986	HF183-qPCR	119		P	50 - 175
2163987	HF183-qPCR	115		P	50 - 175
2163988	HF183-qPCR	100		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P379866

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

Reference Method: SOP-PCR-1.2

Batch ID: P379866

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161208	GULL2-qPCR	99.8	90.5	P	50 - 300
2161209	GULL2-qPCR	96.2		P	50 - 300
2161358	GULL2-qPCR	97.7		P/P	50 - 300
2161748	GULL2-qPCR	92.3		P	50 - 300
2161864	GULL2-qPCR	73.2		P	50 - 300
2161865	GULL2-qPCR	63.0		P	50 - 300
2161866	GULL2-qPCR	67.7		P	50 - 300
2163117	GULL2-qPCR	86.7		P	50 - 300
2163118	GULL2-qPCR	65.3		P	50 - 300
2163986	GULL2-qPCR	91.0		P	50 - 300
2163987	GULL2-qPCR	86.8		P	50 - 300
2163988	GULL2-qPCR	94.8		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P380834

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161208	GFD-purified-qPCR	73.6	129	P	50 - 175
2161209	GFD-purified-qPCR	28.5		F	50 - 175
2161358	GFD-purified-qPCR	106		P/P	50 - 175
2161748	GFD-purified-qPCR	177		F	50 - 175
2163117	GFD-purified-qPCR	171		P	50 - 175
2163118	GFD-purified-qPCR	200		F	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P379866

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161208	BacR-qPCR	81.6	96.2	P	50 - 175
2161209	BacR-qPCR	78.0		P	50 - 175
2161357	BacR-qPCR	84.1		P	50 - 175
2161358	BacR-qPCR	98.4		P/P	50 - 175
2161748	BacR-qPCR	77.5		P	50 - 175
2161864	BacR-qPCR	73.0		P	50 - 175
2161865	BacR-qPCR	66.8		P	50 - 175
2161866	BacR-qPCR	77.1		P	50 - 175
2163117	BacR-qPCR	84.6		P	50 - 175
2163118	BacR-qPCR	74.0		P	50 - 175
2163986	BacR-qPCR	71.2		P	50 - 175
2163987	BacR-qPCR	71.3		P	50 - 175
2163988	BacR-qPCR	64.3		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P379866

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161208	DG3-qPCR	79.5	93.6	P	50 - 175
2161209	DG3-qPCR	84.9		P	50 - 175
2161357	DG3-qPCR	91.2		P	50 - 175
2161358	DG3-qPCR	92.2		P/P	50 - 175
2161748	DG3-qPCR	91.7		P	50 - 175
2161864	DG3-qPCR	75.0		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
 Batch ID: P379866

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161865	DG3-qPCR	77.5		P	50 - 175
2161866	DG3-qPCR	75.1		P	50 - 175
2163117	DG3-qPCR	92.6		P	50 - 175
2163118	DG3-qPCR	85.6		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P379866

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161358	HF183-qPCR	0.563	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P379866

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161358	GULL2-qPCR	7.75	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P380834

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161358	GFD-purified-qPCR	19.4	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P379866

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161358	BacR-qPCR	2.27	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
 Batch ID: P379866

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161358	DG3-qPCR	1.47	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Quality Assurance Report Surrogates

Lab Sample ID: 2161357
Field Sample ID: G3SD0129

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	98.5	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	108	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	87.4	P	50 - 300

Lab Sample ID: 2161358
Field Sample ID: G3SD0128

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	106	P	50 - 300
SOP-PCR-1.0	SKETA-qPCR	99.9	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	93.3	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	98.0	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	99.7	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	94.0	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	58.2	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	51.8	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	109	116	112	109	99.0			0.563
SOP-PCR-1.2	GULL2-qPCR	139	99.1	99.8	96.2	97.7			7.75
SOP-PCR-1.3	GFD-purified-qPCR	21.3	89.6	73.6	28.5	106			19.4
SOP-PCR-1.4	BacR-qPCR	121	99.7	74.0	71.2	71.3			2.27
SOP-PCR-1.5	DG3-qPCR	86.4	96.4	79.5	84.9	91.2			1.47

Reference Method Descriptions

Method	Description	Associated Samples
Colilert-18	E. coli by Colilert-18/QT by Sanders in Fort Myers	2161359, 2161360
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2161357, 2161358
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2161358
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2161358
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2161357, 2161358
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2161357, 2161358

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Colilert-18	03/02/2020	03/02/2020 15:55		03/03/2020 10:25	Sanders-Fort Myers	2161359, 2161360
SOP-PCR-1.0	03/03/2020	03/03/2020 14:00	Angela Smith	03/13/2020 14:01	Lauren Campbell	2161357, 2161358
SOP-PCR-1.2	03/03/2020	03/03/2020 14:00	Angela Smith	03/18/2020 08:26	Mailin Lopez	2161358
SOP-PCR-1.3	03/03/2020	03/03/2020 14:00	Lauren Campbell	03/23/2020 08:27	Mailin Lopez	2161358
SOP-PCR-1.4	03/03/2020	03/03/2020 14:00	Angela Smith	03/17/2020 10:51	Lauren Campbell	2161357, 2161358
SOP-PCR-1.5	03/03/2020	03/03/2020 14:00	Angela Smith	03/17/2020 14:43	Lauren Campbell	2161357, 2161358