

Biological Analysis Report

SO-DIST-2023-03-21-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Overflow Analyses Performed By:
Benchmark EnviroAnalytical, Inc. - North Port
1001 Corporate Avenue, Suite 102
North Port, FL 34289
DOH Accreditation E85086

Event Description: **Horse Creek Ref SCI**
Request ID: **RQ-2023-03-20-35**
Customer: **SO-DIST**
Project ID: **SCIREF**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: John Barrington

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Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 13-JUN-2023 14:42

A handwritten signature in black ink, appearing to be 'Puja Jasrotia', with a horizontal line underneath it.

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: Chlorophyll/Grain Size/BOD, InvertZool, 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: Horse Creek

Collection Date/Time: 03/20/2023 09:00

Field ID: G3SD0157

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2395015	SM 10150 B	Chlorophyll-a, Corrected	1.6	I	ug/L	P427774	
		Phaeophytin-a	1.1	I	ug/L	P427774	
		Chlorophyll-a, Uncorrected	2.3		ug/L	P427774	
2395018	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P427266	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P427266	
	SOP-PCR-1.3	GFD-qPCR**	940	I	TSC/100 mL	P427266	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P427266	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P427266	
2395025	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	52		MPN/100 mL		
2395034	SOP-IZ06	Stream Condition Index (SCI)**	60		Points	P430819	
		Macroinvert-FW-Qual-DipnetX20-#Taxa-Rep2**	26		# Taxa	P430819	

Ref. Method and Comment:

SM 10150 B: Precision data is not available for at least one component due to the small amount of analyte in the QC sample. Refer to QA report for available precision data.

SOP-PCR-1.2: Precision data unavailable for Gull2-qPCR component.

SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

Quality Assurance Report

Method Blank Results

Reference Method: SM 10150 B

Batch ID: P427774

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.89	U	ug/L
Chlorophyll-a, Uncorrected	0.65	U	ug/L
Phaeophytin-a	0.98	U	ug/L

Reference Method: SOP-PCR-1.0

Batch ID: P427266

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

Reference Method: SOP-PCR-1.2

Batch ID: P427266

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

Reference Method: SOP-PCR-1.3

Batch ID: P427266

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

Reference Method: SOP-PCR-1.4

Batch ID: P427266

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

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.5
Batch ID: P427266

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10150 B
Batch ID: P427774

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	94.7		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P427266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	96.2	91.2	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P427266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	96.5	78.8	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P427266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	107	98.3	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P427266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	110	97.7	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P427266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	105	93.2	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P427266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394341	HF183-qPCR	80.2	84.6	P/P	50 - 175
2394733	HF183-qPCR	86.8		P	50 - 175
2394759	HF183-qPCR	85.4		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P427266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395018	HF183-qPCR	92.6		P	50 - 175
2395108	HF183-qPCR	95.7		P	50 - 175
2395444	HF183-qPCR	125		P	50 - 175
2395445	HF183-qPCR	102		P	50 - 175
2395836	HF183-qPCR	84.7		P	50 - 175
2395883	HF183-qPCR	83.3		P	50 - 175
2395884	HF183-qPCR	88.3		P	50 - 175
2396251	HF183-qPCR	90.8		P	50 - 175
2396286	HF183-qPCR	83.1		P	50 - 175
2396574	HF183-qPCR	89.4		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P427266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394733	GULL2-qPCR	70.1		P	50 - 300
2394759	GULL2-qPCR	78.8		P	50 - 300
2395018	GULL2-qPCR	93.4		P	50 - 300
2395108	GULL2-qPCR	91.5		P	50 - 300
2395444	GULL2-qPCR	85.1		P	50 - 300
2395445	GULL2-qPCR	90.6		P	50 - 300
2395836	GULL2-qPCR	76.1		P	50 - 300
2395883	GULL2-qPCR	80.9		P	50 - 300
2395884	GULL2-qPCR	77.6		P	50 - 300
2396251	GULL2-qPCR	76.4		P	50 - 300
2396286	GULL2-qPCR	63.5		P	50 - 300
2396574	GULL2-qPCR	63.3		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P427266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394733	GFD-qPCR	91.7		P	50 - 175
2394759	GFD-qPCR	109		P	50 - 175
2395018	GFD-qPCR	110		P	50 - 175
2395108	GFD-qPCR	105		P	50 - 175
2395444	GFD-qPCR	104		P	50 - 175
2395445	GFD-qPCR	93.6		P	50 - 175
2395836	GFD-qPCR	106		P	50 - 175
2395883	GFD-qPCR	99.6		P	50 - 175
2395884	GFD-qPCR	106		P	50 - 175
2396251	GFD-qPCR	107		P	50 - 175
2396286	GFD-qPCR	94.8		P	50 - 175
2396574	GFD-qPCR	97.2		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P427266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394341	BacR-qPCR	84.8	91.8	P/P	50 - 175
2394733	BacR-qPCR	89.2		P	50 - 175
2394759	BacR-qPCR	81.2		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P427266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395018	BacR-qPCR	95.4		P	50 - 175
2395108	BacR-qPCR	92.0		P	50 - 175
2395444	BacR-qPCR	101		P	50 - 175
2395445	BacR-qPCR	101		P	50 - 175
2395836	BacR-qPCR	81.7		P	50 - 175
2395883	BacR-qPCR	91.0		P	50 - 175
2395884	BacR-qPCR	83.9		P	50 - 175
2396251	BacR-qPCR	96.1		P	50 - 175
2396286	BacR-qPCR	75.4		P	50 - 175
2396574	BacR-qPCR	78.4		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P427266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394341	DG3-qPCR	95.9	95.5	P/P	50 - 175
2394733	DG3-qPCR	95.5		P	50 - 175
2394759	DG3-qPCR	97.4		P	50 - 175
2395018	DG3-qPCR	104		P	50 - 175
2395108	DG3-qPCR	102		P	50 - 175
2395444	DG3-qPCR	110		P	50 - 175
2395445	DG3-qPCR	108		P	50 - 175
2395836	DG3-qPCR	95.3		P	50 - 175
2395883	DG3-qPCR	98.8		P	50 - 175
2395884	DG3-qPCR	99.7		P	50 - 175
2396251	DG3-qPCR	102		P	50 - 175
2396286	DG3-qPCR	101		P	50 - 175
2396574	DG3-qPCR	102		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P427266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394341	HF183-qPCR	5.28	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P427266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394341	BacR-qPCR	7.57	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P427266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: SOP-PCR-1.5
Batch ID: P427266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394341	DG3-qPCR	0.424	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2395018
Field Sample ID: G3SD0157

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	119	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	125	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	127	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	119	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	115	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10150 B	Chlorophyll-a, Corrected	94.7							
SOP-PCR-1.0	HF183-qPCR	91.2	96.2	80.2	84.6	86.8			5.28
				85.4					
SOP-PCR-1.2	GULL2-qPCR	78.8	96.5	70.1	78.8	93.4			
				91.5					
SOP-PCR-1.3	GFD-qPCR	98.3	107	91.7	109	110			
				105					
SOP-PCR-1.4	BacR-qPCR	97.7	110	84.8	91.8	89.2			7.57
				81.2					
SOP-PCR-1.5	DG3-qPCR	93.2	105	95.9	95.5	95.5			0.424
				97.4					

Reference Method Descriptions

Method	Description	Associated Samples
SM 10150 B	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2395015
SM 9223 Quanti-Tray	E. coli by Colilert/QT by BEA South in North Port	2395025
SOP-IZ06	No. Taxa of FW macroinverts, qual samp, 20 dipnets.	2395034
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2395018
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2395018
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2395018
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2395018

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2395018

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10150 B	03/21/2023	03/21/2023 15:01	Callie Williams	03/27/2023 12:50	Aidan Cronin	2395015
SM 9223 Quanti-Tray	03/20/2023	03/20/2023 14:47		03/21/2023 15:30	Benchmark EnviroAnalytical in North Port	2395025
SOP-IZ06	03/21/2023	05/31/2023 16:10	Sage EM Veale	06/08/2023 09:18	Todd R. Risk	2395034
SOP-PCR-1.0	03/21/2023	03/21/2023 14:05	Claudia Castro	04/06/2023 09:03	Roberta Tatti	2395018
SOP-PCR-1.2	03/21/2023	03/21/2023 14:05	Claudia Castro	04/13/2023 16:28	Jennifer Mihalic	2395018
SOP-PCR-1.3	03/21/2023	03/21/2023 14:05	Claudia Castro	04/11/2023 16:54	Jennifer Mihalic	2395018
SOP-PCR-1.4	03/21/2023	03/21/2023 14:05	Claudia Castro	04/06/2023 11:40	Roberta Tatti	2395018
SOP-PCR-1.5	03/21/2023	03/21/2023 14:05	Claudia Castro	04/07/2023 09:21	Roberta Tatti	2395018