

Biological Analysis Report

SO-DIST-2024-01-11-02

Florida DEP 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: **2024 SMP : Highlands Creeks**
Request ID: **RQ-2024-01-08-36**
Customer: **SO-DIST**
Project ID: **SMP**

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

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Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 20-FEB-2024 09:51

A handwritten signature in black ink, appearing to be 'Puja Jasrotia', with a horizontal line extending to the right.

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, 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: Bonnet Creek at SR 64

Collection Date/Time: 01/10/2024 09:40

Field ID: G4SD0107

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2460468	SOP-PCR-1.0	HF183-qPCR**	2.2E+03	U	TSC/100 mL	P439656	
	SOP-PCR-1.4	BacR-qPCR**	1.74E+05		TSC/100 mL	P439656	
	SOP-PCR-1.5	DG3-qPCR**	1.7E+03	U	TSC/100 mL	P439656	
2460469	Colilert-18	Escherichia Coli-Quanti-Tray	326		MPN/100 mL		

Sample Location: BONNETCREEKATOLDBMBNGRD

Collection Date/Time: 01/10/2024 10:05

Field ID: G4SD0211

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2460470	Colilert-18	Escherichia Coli-Quanti-Tray	236		MPN/100 mL		

Sample Location: Blue Lake at Center

Collection Date/Time: 01/10/2024 11:30

Field ID: G4SD0157

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2460466	SM 10150 B	Chlorophyll-a, Corrected	26		ug/L	P439946	
		Phaeophytin-a	1.9	I	ug/L	P439946	
		Chlorophyll-a, Uncorrected	28		ug/L	P439946	

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.

Sample Location: LAKEPLACIDOUTLETATSR70W

Collection Date/Time: 01/10/2024 12:05

Field ID: G4SD0213

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2460467	SM 10150 B	Chlorophyll-a, Corrected	1.4	U	ug/L	P439946	
		Phaeophytin-a	1.5	U	ug/L	P439946	
		Chlorophyll-a, Uncorrected	1.5	I	ug/L	P439946	
2460471	Colilert-18	Escherichia Coli-Quanti-Tray	1300		MPN/100 mL		

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.

Quality Assurance Report
Method Blank Results

Reference Method: SM 10150 B
Batch ID: P439946

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.82	U	ug/L
Chlorophyll-a, Uncorrected	0.60	U	ug/L
Phaeophytin-a	0.90	U	ug/L

Reference Method: SOP-PCR-1.0
Batch ID: P439656

Component	Result	Code	Units
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Quality Assurance Report
Method Blank Results

Reference Method: SOP-PCR-1.0
Batch ID: P439656

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

Reference Method: SOP-PCR-1.4
Batch ID: P439656

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

Reference Method: SOP-PCR-1.5
Batch ID: P439656

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: P439946

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	95.4		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P439656

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	90.5	89.5	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P439656

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	97.6	82.1	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P439656

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	92.6	84.5	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P439656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2459335	HF183-qPCR	87.5	84.1	P/P	50 - 175
2459336	HF183-qPCR	93.3		P	50 - 175
2459337	HF183-qPCR	104		P	50 - 175

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P439656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2459338	HF183-qPCR	104		P	50 - 175
2459864	HF183-qPCR	96.1		P	50 - 175
2459950	HF183-qPCR	94.4		P	50 - 175
2460468	HF183-qPCR	84.8		P	50 - 175
2460496	HF183-qPCR	89.6		P	50 - 175
2460497	HF183-qPCR	94.9		P	50 - 175
2461329	HF183-qPCR	95.8		P	50 - 175
2462427	HF183-qPCR	99.3		P	50 - 175
2462428	HF183-qPCR	123		P	50 - 175
2462429	HF183-qPCR	110		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P439656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2459335	BacR-qPCR	87.4	89.1	P/P	50 - 175
2459336	BacR-qPCR	73.2		P	50 - 175
2459337	BacR-qPCR	92.0		P	50 - 175
2459338	BacR-qPCR	72.1		P	50 - 175
2459864	BacR-qPCR	88.5		P	50 - 175
2460468	BacR-qPCR	68.0		P	50 - 175
2460496	BacR-qPCR	65.7		P	50 - 175
2460497	BacR-qPCR	82.4		P	50 - 175
2461329	BacR-qPCR	83.4		P	50 - 175
2462427	BacR-qPCR	86.1		P	50 - 175
2462428	BacR-qPCR	87.7		P	50 - 175
2462429	BacR-qPCR	80.7		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P439656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2459335	DG3-qPCR	89.3	90.1	P/P	50 - 175
2459336	DG3-qPCR	84.3		P	50 - 175
2459337	DG3-qPCR	102		P	50 - 175
2459338	DG3-qPCR	89.1		P	50 - 175
2459864	DG3-qPCR	91.6		P	50 - 175
2459950	DG3-qPCR	89.7		P	50 - 175
2460468	DG3-qPCR	86.4		P	50 - 175
2460496	DG3-qPCR	86.6		P	50 - 175
2460497	DG3-qPCR	95.8		P	50 - 175
2461329	DG3-qPCR	92.3		P	50 - 175
2462427	DG3-qPCR	101		P	50 - 175
2462428	DG3-qPCR	100		P	50 - 175
2462429	DG3-qPCR	93.4		P	50 - 175

Quality Assurance Report

Precision

Quality Assurance Report

Precision

Reference Method: SM 10150 B

Batch ID: P439946

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2460620	Chlorophyll-a, Uncorrected	9.48	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0

Batch ID: P439656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2459335	HF183-qPCR	3.92	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4

Batch ID: P439656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2459335	BacR-qPCR	1.95	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5

Batch ID: P439656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2459335	DG3-qPCR	0.875	Spike	P	0 - 25

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

Quality Assurance Report

Surrogates

Lab Sample ID: 2460468

Field Sample ID: G4SD0107

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	109	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	107	P	50 - 300

Quality Assurance Report

Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10150 B	Chlorophyll-a, Corrected	95.4						9.48	
	Chlorophyll-a, Uncorrected								
SOP-PCR-1.0	HF183-qPCR	89.5	90.5	87.5	84.1	93.3			3.92
				104					
SOP-PCR-1.4	BacR-qPCR	82.1	97.6	87.4	89.1	73.2			1.95
				92.0					
SOP-PCR-1.5	DG3-qPCR	84.5	92.6	89.3	90.1	84.3			0.875
				102					

Reference Method Descriptions

Method	Description	Associated Samples
Colilert-18	E. coli by Colilert-18/QT by Sanders in Fort Myers	2460469, 2460470, 2460471
SM 10150 B	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2460466, 2460467
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2460468
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2460468
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2460468

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Colilert-18	01/10/2024	01/10/2024 15:22		01/11/2024 09:50	Sanders-Fort Myers	2460469, 2460470, 2460471
SM 10150 B	01/11/2024	01/11/2024 13:32	Keanu Thijm	01/16/2024 10:56	Megan Higbee	2460466, 2460467
SOP-PCR-1.0	01/11/2024	01/11/2024 13:36	Lily Gregson	01/25/2024 08:53	Roberta Tatti	2460468
SOP-PCR-1.4	01/11/2024	01/11/2024 13:36	Lily Gregson	01/26/2024 08:47	Roberta Tatti	2460468
SOP-PCR-1.5	01/11/2024	01/11/2024 13:36	Lily Gregson	01/26/2024 09:54	Roberta Tatti	2460468