Biological Analysis Report

SO-DIST-2022-12-09-01

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: **2022 SMP : Arbuckle +SCI?**
Request ID: **RQ-2022-12-05-36**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: William Mullen

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Certified by: Sarah Menz, Environmental Administrator

Date Certified: 30-JAN-2023 09:42

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: Arbuckle Branch **Collection Date/Time: 12/08/2022 10:30**

Field ID: G4SD0172 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2374159	SM 10200 H (mod.)	Chlorophyll-a, Corrected	6.7	A	ug/L	P423613	
		Phaeophytin-a	4.2	I	ug/L	P423613	
		Chlorophyll-a, Uncorrected	9.5	A	ug/L	P423613	
2374161	SOP-PCR-1.0	HF183-qPCR**	6.6E+03	U	TSC/100 mL	P423278	
	SOP-PCR-1.4	BacR-qPCR**	3.0E+04	I	TSC/100 mL	P423278	
	SOP-PCR-1.5	DG3-qPCR**	5.1E+03	U	TSC/100 mL	P423278	
2374162	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	933		MPN/100 mL		

Ref. Method and Comment:
SM 10200 H (mod.): Laboratory duplicate result is 4.2 I for Phaeophytin-a. Precision data is unavailable due to the small amount of analyte in the QC sample.

Sample Location: Arbuckle Branch **Collection Date/Time: 12/08/2022 10:30**

Field ID: G4SD0172 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2374160	SOP-IZ06	Stream Condition Index (SCI)**	48		Points	P425007	
		Macroinvert-FW-Qual-DipnetX20-#Taxa -Rep2**	22		# Taxa		

Quality Assurance Report
Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P423613

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: P423278

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

Reference Method: SOP-PCR-1.4
Batch ID: P423278

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

Reference Method: SOP-PCR-1.5
Batch ID: P423278

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: SM 10200 H (mod.)
Batch ID: P423613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	97.4		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P423278

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	102	90.2	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P423278

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	130	84.5	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P423278

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	87.6	88.0	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P423278

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373805	HF183-qPCR	91.3		P	50 - 175
2373806	HF183-qPCR	85.8	88.9	P/P	50 - 175
2374161	HF183-qPCR	85.6		P	50 - 175
2374542	HF183-qPCR	85.4		P	50 - 175
2374653	HF183-qPCR	88.0		P	50 - 175
2374657	HF183-qPCR	95.7		P	50 - 175
2374926	HF183-qPCR	87.9		P	50 - 175
2374927	HF183-qPCR	87.7		P	50 - 175
2374941	HF183-qPCR	85.4		P	50 - 175
2375190	HF183-qPCR	71.0		P	50 - 175
2375636	HF183-qPCR	83.6		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P423278

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373805	BacR-qPCR	104		P	50 - 175
2373806	BacR-qPCR	99.8	102	P/P	50 - 175
2374161	BacR-qPCR	96.6		P	50 - 175
2374542	BacR-qPCR	85.9		P	50 - 175
2374653	BacR-qPCR	83.0		P	50 - 175
2374657	BacR-qPCR	95.7		P	50 - 175
2374926	BacR-qPCR	93.5		P	50 - 175
2374927	BacR-qPCR	96.4		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P423278

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2374941	BacR-qPCR	90.4		P	50 - 175
2375190	BacR-qPCR	72.2		P	50 - 175
2375636	BacR-qPCR	77.2		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P423278

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373805	DG3-qPCR	89.8		P	50 - 175
2373806	DG3-qPCR	103	99.6	P/P	50 - 175
2374161	DG3-qPCR	87.6		P	50 - 175
2374542	DG3-qPCR	90.5		P	50 - 175
2374653	DG3-qPCR	89.5		P	50 - 175
2374657	DG3-qPCR	94.4		P	50 - 175
2374926	DG3-qPCR	92.8		P	50 - 175
2374927	DG3-qPCR	92.1		P	50 - 175
2374941	DG3-qPCR	92.4		P	50 - 175
2375190	DG3-qPCR	91.4		P	50 - 175
2375636	DG3-qPCR	83.0		P	50 - 175

Quality Assurance Report
Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P423613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374159	Chlorophyll-a, Corrected	6.65	Sample	P	0 - 25
2374159	Chlorophyll-a, Uncorrected	5.16	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P423278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373806	HF183-qPCR	3.56	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P423278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373806	BacR-qPCR	2.46	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P423278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373806	DG3-qPCR	3.44	Spike	P	0 - 25

Quality Assurance Report
Precision

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2374161
Field Sample ID: G4SD0172

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	79.2	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	96.3	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	81.7	P	50 - 300

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision		
				LCS	SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	97.4			6.65	
	Chlorophyll-a, Uncorrected				5.16	
SOP-PCR-1.0	HF183-qPCR	90.2 102	91.3 85.8 88.9 85.6			3.56
SOP-PCR-1.4	BacR-qPCR	84.5 130	104 99.8 102 96.6			2.46
SOP-PCR-1.5	DG3-qPCR	88.0 87.6	89.8 103 99.6 87.6			3.44

Reference Method Descriptions

Method	Description	Associated Samples
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2374159
SM 9223 Quanti-Tray	E. coli by Colilert/QT by BEA South in North Port	2374162
SOP-IZ06	No. Taxa of FW macroinverts, qual samp, 20 dipnets.	2374160
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2374161
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2374161
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2374161

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	12/09/2022	12/09/2022 15:28	Aidan Cronin	12/14/2022 09:47	Megan Higbee	2374159
SM 9223 Quanti-Tray	12/08/2022	12/08/2022 16:37		12/09/2022 16:54	Benchmark EnviroAnalytical in North Port	2374162
SOP-IZ06	12/09/2022	01/17/2023 06:48	Todd R. Risk	01/26/2023 11:00	Todd R. Risk	2374160
SOP-PCR-1.0	12/09/2022	12/09/2022 14:35	Claudia Castro	12/19/2022 14:57	DeAsia Armster	2374161
SOP-PCR-1.4	12/09/2022	12/09/2022 14:35	Claudia Castro	12/20/2022 09:17	Roberta Tatti	2374161
SOP-PCR-1.5	12/09/2022	12/09/2022 14:35	Claudia Castro	12/20/2022 12:47	DeAsia Armster	2374161