

Biological Analysis Report

CEN-DIST-2023-01-05-01

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

Event Description: **Tiger/Henry/Smart**
Request ID: **RQ-2023-01-02-58**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Jessie Atchison

For additional information please contact
Cheryl Swanson - Administrator
Sarah Menz, Ph.D. - Bench Biology & Aquatic
Toxicity
Puja Jasrotia, Ph.D. - Molecular Biology & Taxonomy
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8177

Certified by: Sarah Menz, Environmental Administrator

Date Certified: 08-FEB-2023 10:50

A handwritten signature in dark ink, appearing to be 'Sarah Menz', with a long, sweeping horizontal stroke 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, 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: Lake Henry @ Center

Collection Date/Time: 01/04/2023 10:58

Field ID: G3CE0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2378115	SM 10200 H (mod.)	Chlorophyll-a, Corrected	3.2		ug/L	P424315	
		Phaeophytin-a	0.90	U	ug/L	P424315	
		Chlorophyll-a, Uncorrected	3.6		ug/L	P424315	
2378116	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	2.0	JQ	MPN/100 mL	P424407	
2378129	SOP-PCR-1.0	HF183-qPCR**	3.3E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.2	GULL2-qPCR**	3.6E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.3	GFD-qPCR**	720	U	TSC/100 mL	P423971	
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P423971	

Ref. Method and Comment:

SM 10200 H (mod.): 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.

SM 9223 B Quanti-Tray: Result is J-qualified due to a plasticware sterility check failure. Precision data is unavailable for E. coli due to the small amount of analyte in the QC sample for the batch.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P424315

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: SM 9223 B Quanti-Tray

Batch ID: P424407

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

Reference Method: SOP-PCR-1.0

Batch ID: P423971

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

Reference Method: SOP-PCR-1.2

Batch ID: P423971

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

Reference Method: SOP-PCR-1.3

Batch ID: P423971

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

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.4
Batch ID: P423971

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

Reference Method: SOP-PCR-1.5
Batch ID: P423971

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P424315

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	99.2		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	90.2	92.7	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	114	86.5	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	104	100	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	93.3	102	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	97.7	108	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377548	HF183-qPCR	75.5	74.3	P/P	50 - 175
2378129	HF183-qPCR	81.8		P	50 - 175
2378288	HF183-qPCR	97.5		P	50 - 175
2378289	HF183-qPCR	90.6		P	50 - 175
2378943	HF183-qPCR	87.5		P	50 - 175
2378944	HF183-qPCR	75.2		P	50 - 175
2379128	HF183-qPCR	112		P	50 - 175
2379845	HF183-qPCR	85.3		P	50 - 175
2379846	HF183-qPCR	87.8		P	50 - 175
2379847	HF183-qPCR	91.9		P	50 - 175
2379862	HF183-qPCR	94.9		P	50 - 175
2379863	HF183-qPCR	91.4		P	50 - 175
2379864	HF183-qPCR	101		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378129	GULL2-qPCR	77.4		P	50 - 300
2378288	GULL2-qPCR	76.8		P	50 - 300
2378289	GULL2-qPCR	86.5		P	50 - 300
2378943	GULL2-qPCR	77.5		P	50 - 300
2379845	GULL2-qPCR	82.9		P	50 - 300
2379846	GULL2-qPCR	80.4		P	50 - 300
2379847	GULL2-qPCR	91.3		P	50 - 300
2379863	GULL2-qPCR	96.0		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378129	GFD-qPCR	108		P	50 - 175
2378288	GFD-qPCR	106		P	50 - 175
2378289	GFD-qPCR	98.4		P	50 - 175
2378943	GFD-qPCR	112		P	50 - 175
2379845	GFD-qPCR	110		P	50 - 175
2379846	GFD-qPCR	100		P	50 - 175
2379847	GFD-qPCR	95.1		P	50 - 175
2379863	GFD-qPCR	95.8		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377548	BacR-qPCR	69.1	71.2	P/P	50 - 175
2378129	BacR-qPCR	73.6		P	50 - 175
2378288	BacR-qPCR	79.4		P	50 - 175
2378289	BacR-qPCR	83.5		P	50 - 175
2378943	BacR-qPCR	63.4		P	50 - 175
2378944	BacR-qPCR	73.9		P	50 - 175
2379128	BacR-qPCR	82.3		P	50 - 175
2379845	BacR-qPCR	78.1		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379846	BacR-qPCR	75.6		P	50 - 175
2379847	BacR-qPCR	80.2		P	50 - 175
2379862	BacR-qPCR	59.6		P	50 - 175
2379863	BacR-qPCR	89.3		P	50 - 175
2379864	BacR-qPCR	84.5		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377548	DG3-qPCR	88.2	83.8	P/P	50 - 175
2378129	DG3-qPCR	83.0		P	50 - 175
2378288	DG3-qPCR	92.2		P	50 - 175
2378289	DG3-qPCR	92.6		P	50 - 175
2378943	DG3-qPCR	83.4		P	50 - 175
2378944	DG3-qPCR	88.5		P	50 - 175
2379128	DG3-qPCR	99.6		P	50 - 175
2379845	DG3-qPCR	102		P	50 - 175
2379846	DG3-qPCR	99.5		P	50 - 175
2379847	DG3-qPCR	92.8		P	50 - 175
2379862	DG3-qPCR	89.2		P	50 - 175
2379863	DG3-qPCR	110		P	50 - 175
2379864	DG3-qPCR	106		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P424315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378076	Chlorophyll-a, Corrected	4.84	Sample	P	0 - 25
2378076	Chlorophyll-a, Uncorrected	1.01	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	HF183-qPCR	1.59	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	GULL2-qPCR	1.26	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.3
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	GFD-qPCR	9.76	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	BacR-qPCR	3.05	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	DG3-qPCR	5.15	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2378129
Field Sample ID: G3CE0040

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	97.9	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	115	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	111	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	88.9	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery			MS % Recovery			Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	99.2						4.84	
	Chlorophyll-a, Uncorrected							1.01	
SOP-PCR-1.0	HF183-qPCR	92.7	90.2		75.5	74.3	81.8		1.59
SOP-PCR-1.2	GULL2-qPCR	86.5	114		97.5	77.4	76.8	86.5	1.26
					77.5				
SOP-PCR-1.3	GFD-qPCR	100	104		108	106	98.4		9.76
SOP-PCR-1.4	BacR-qPCR	93.3	102		112	69.1	71.2	73.6	3.05
					79.4				
SOP-PCR-1.5	DG3-qPCR	108	97.7		88.2	83.8	83.0		5.15
					92.2				

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2378115
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2378116
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2378129
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2378129
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2378129
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2378129
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2378129

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	01/05/2023	01/05/2023 14:35	Megan Higbee	01/09/2023 10:03	Megan Higbee	2378115
SM 9223 B Quanti-Tray	01/05/2023	01/05/2023 15:47	Tynan A Branch	01/06/2023 10:55	Tynan A Branch	2378116
SOP-PCR-1.0	01/05/2023	01/05/2023 13:30	DeAsia Armster	01/17/2023 10:07	Roberta Tatti	2378129
SOP-PCR-1.2	01/05/2023	01/05/2023 13:30	DeAsia Armster	01/19/2023 14:25	DeAsia Armster	2378129
SOP-PCR-1.3	01/05/2023	01/05/2023 13:30	DeAsia Armster	01/20/2023 08:21	Roberta Tatti	2378129
SOP-PCR-1.4	01/05/2023	01/05/2023 13:30	DeAsia Armster	01/18/2023 09:21	DeAsia Armster	2378129
SOP-PCR-1.5	01/05/2023	01/05/2023 13:30	DeAsia Armster	01/19/2023 09:49	Roberta Tatti	2378129