Biological Analysis Report

SO-DIST-2023-01-20-01

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: **2023 SMP: Stadium Arcadia**
Request ID: **RQ-2023-01-16-20**
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: William Mullen

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: Puja Jasrotia, Environmental Administrator

Date Certified: 22-FEB-2023 11:11

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: G3SD0184 **Collection Date/Time: 01/19/2023 09:40**

Field ID: G3SD0184 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2382124	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	676		MPN/100 mL		

Sample Location: G3SD0159 **Collection Date/Time: 01/19/2023 10:30**

Field ID: G3SD0159 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2382122	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P424475	
	SOP-PCR-1.4	BacR-qPCR**	3.52E+04		TSC/100 mL	P424475	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P424475	
2382125	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	301		MPN/100 mL		

Sample Location: G3SD0011 **Collection Date/Time: 01/19/2023 11:00**

Field ID: G3SD0011 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2382121	SM 10200 H (mod.)	Chlorophyll-a, Corrected	5.2		ug/L	P424921	
		Phaeophytin-a	2.4	I	ug/L	P424921	
		Chlorophyll-a, Uncorrected	6.8		ug/L	P424921	
2382123	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P424475	
	SOP-PCR-1.4	BacR-qPCR**	3.46E+04		TSC/100 mL	P424475	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P424475	
2382126	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	581		MPN/100 mL		

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.

Quality Assurance Report
Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P424921

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.96	U	ug/L
Chlorophyll-a, Uncorrected	0.70	U	ug/L
Phaeophytin-a	1.0	U	ug/L

Reference Method: SOP-PCR-1.0
Batch ID: P424475

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

Reference Method: SOP-PCR-1.4
Batch ID: P424475

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: P424475

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: P424921

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	92.7		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P424475

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	103	82.5	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P424475

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	106	106	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P424475

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	106	93.3	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P424475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2380679	HF183-qPCR	83.6	88.0	P/P	50 - 175
2381174	HF183-qPCR	92.0		P	50 - 175
2381362	HF183-qPCR	101		P	50 - 175
2381509	HF183-qPCR	94.9		P	50 - 175
2381510	HF183-qPCR	89.4		P	50 - 175
2382122	HF183-qPCR	87.4		P	50 - 175
2382123	HF183-qPCR	85.2		P	50 - 175
2382161	HF183-qPCR	79.9		P	50 - 175
2382346	HF183-qPCR	88.1		P	50 - 175
2382347	HF183-qPCR	85.7		P	50 - 175
2382380	HF183-qPCR	87.2		P	50 - 175
2382612	HF183-qPCR	80.8		P	50 - 175
2382613	HF183-qPCR	79.4		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P424475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2380679	BacR-qPCR	76.5	73.6	P/P	50 - 175
2381174	BacR-qPCR	84.6		P	50 - 175
2381362	BacR-qPCR	94.6		P	50 - 175
2381509	BacR-qPCR	85.1		P	50 - 175
2381510	BacR-qPCR	80.7		P	50 - 175
2382122	BacR-qPCR	78.9		P	50 - 175
2382123	BacR-qPCR	83.6		P	50 - 175
2382161	BacR-qPCR	80.3		P	50 - 175
2382346	BacR-qPCR	85.1		P	50 - 175
2382347	BacR-qPCR	88.1		P	50 - 175
2382380	BacR-qPCR	79.9		P	50 - 175
2382612	BacR-qPCR	81.1		P	50 - 175
2382613	BacR-qPCR	85.9		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P424475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2380679	DG3-qPCR	87.6	85.6	P/P	50 - 175
2381174	DG3-qPCR	87.2		P	50 - 175
2381362	DG3-qPCR	90.4		P	50 - 175
2381509	DG3-qPCR	96.9		P	50 - 175
2381510	DG3-qPCR	90.9		P	50 - 175
2382122	DG3-qPCR	93.5		P	50 - 175
2382123	DG3-qPCR	96.4		P	50 - 175
2382161	DG3-qPCR	90.3		P	50 - 175
2382346	DG3-qPCR	89.3		P	50 - 175
2382347	DG3-qPCR	93.8		P	50 - 175
2382380	DG3-qPCR	96.8		P	50 - 175
2382612	DG3-qPCR	96.8		P	50 - 175
2382613	DG3-qPCR	92.5		P	50 - 175

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.0
Batch ID: P424475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2380679	HF183-qPCR	5.22	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P424475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2380679	BacR-qPCR	3.81	Spike	P	0 - 25

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.5
Batch ID: P424475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2380679	DG3-qPCR	2.33	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2382122
Field Sample ID: G3SD0159

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	79.8	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	90.0	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	82.2	P	50 - 300

Lab Sample ID: 2382123
Field Sample ID: G3SD0011

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	91.6	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	94.1	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	98.8	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	92.7				
SOP-PCR-1.0	HF183-qPCR	82.5 103	83.6 88.0 92.0 101			5.22
SOP-PCR-1.4	BacR-qPCR	106 106	76.5 73.6 84.6 94.6			3.81
SOP-PCR-1.5	DG3-qPCR	93.3 106	87.6 85.6 87.2 90.4			2.33

Reference Method Descriptions

Method	Description	Associated Samples
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2382121
SM 9223 Quanti-Tray	E. coli by Colilert/QT by BEA South in North Port	2382124, 2382125, 2382126
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2382122, 2382123
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2382122, 2382123
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2382122, 2382123

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	01/20/2023	01/20/2023 13:03	Megan Higbee	01/23/2023 15:10	Aidan Cronin	2382121
SM 9223 Quanti-Tray	01/19/2023	01/19/2023 15:32		01/20/2023 16:23	Benchmark EnviroAnalytical in North Port	2382124, 2382125, 2382126
SOP-PCR-1.0	01/20/2023	01/20/2023 13:35	Claudia Castro	01/30/2023 09:24	DeAsia Armster	2382122, 2382123
SOP-PCR-1.4	01/20/2023	01/20/2023 13:35	Claudia Castro	01/31/2023 08:07	Roberta Tatti	2382122, 2382123
SOP-PCR-1.5	01/20/2023	01/20/2023 13:35	Claudia Castro	01/31/2023 13:23	DeAsia Armster	2382122, 2382123