

Biological Analysis Report

SW-DIST-2019-04-17-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Overflow Analyses Performed By:
Benchmark Environmental, Inc.
1711 12th Street East
Palmetto, FL 34221
DOH Accreditation E84167

Event Description: **SMP: Cedar, Mocassin**

Request ID: **RQ-2019-04-15-03**

Customer: **SW-DIST**

Project ID: **SMP**

Send Reports to:

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Date Certified: 31-MAY-2019 11:23



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: MOCCASIN CREEK TIDAL

Collection Date/Time: 04/16/2019 10:00

Field ID: G1SW0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2078651	SM 10200 H (mod.)	Chlorophyll-a, Corrected	19		ug/L	P363091	
		Phaeophytin-a	3.3		ug/L	P363091	
		Chlorophyll-a, Uncorrected	22		ug/L	P363091	
2078652	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P363642	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P363642	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	3.28E+03	J	TSC/100 mL	P364444	MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P363642	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P362063	
2078655	Enterolert/QT	Enterococci-Quanti-Tray	402		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.

SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Sample Location: CEDAR CREEK @ PINEHURST (PC 09-02)

Collection Date/Time: 04/16/2019 11:20

Field ID: G5SW0129

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2078653	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P363642	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P363642	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	3.36E+03	J	TSC/100 mL	P364444	MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P363642	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P362063	
2078656	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	723		MPN/100 mL		

Ref. Method and Comment:

SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Sample Location: CEDAR CREEK ABOVE PATRICIA AVE

Collection Date/Time: 04/16/2019 10:45

Field ID: G5SW0147

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2078650	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.8	I	ug/L	P363091	
		Phaeophytin-a	1.2	I	ug/L	P363091	
		Chlorophyll-a, Uncorrected	2.6		ug/L	P363091	
2078654	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	624		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.

Sample Location: CEDAR CREEK ABOVE PATRICIA AVE

Collection Date/Time: 04/16/2019 10:45

Field ID: G5SW0147

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2078663	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P363642	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P363642	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	1.90E+03	J	TSC/100 mL	P364444	MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P363642	

Field ID: G5SW0147

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2078663	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P362063	

Ref. Method and Comment:
 SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
 Batch ID: P363091

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: P363642

Component	Result	Code	Units
HF183-qPCR	280	U	GEU/100 mL

Reference Method: SOP-PCR-1.2
 Batch ID: P363642

Component	Result	Code	Units
GULL2-qPCR	1.7E+04	U	TSC/100 mL

Reference Method: SOP-PCR-1.3
 Batch ID: P364444

Component	Result	Code	Units
GFD-purified-qPCR	340	U	TSC/100 mL

Reference Method: SOP-PCR-1.4
 Batch ID: P363642

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
 Batch ID: P363091

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	94.5		P	84 - 116

Reference Method: SOP-PCR-1.0
 Batch ID: P363642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	117	145	P/P	50 - 175

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.2
Batch ID: P363642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	104	84.7	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P364444

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	115	59.4	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P363642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	84.4	85.1	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P363642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2078652	HF183-qPCR	104		P	50 - 175
2078653	HF183-qPCR	101		P	50 - 175
2078663	HF183-qPCR	103		P	50 - 175
2080143	HF183-qPCR	99.6		P	50 - 175
2081742	HF183-qPCR	96.7		P	50 - 175
2081744	HF183-qPCR	76.6		P	50 - 175
2081745	HF183-qPCR	99.9		P	50 - 175
2082148	HF183-qPCR	71.8		P	50 - 175
2082749	HF183-qPCR	74.9		P	50 - 175
2082750	HF183-qPCR	79.2		P	50 - 175
2084686	HF183-qPCR	96.2	109	P/P	50 - 175
2085190	HF183-qPCR	85.1		P	50 - 175
2085695	HF183-qPCR	86.4		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P363642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2078652	GULL2-qPCR	87.0		P	50 - 300
2078653	GULL2-qPCR	118		P	50 - 300
2078663	GULL2-qPCR	90.2		P	50 - 300
2080143	GULL2-qPCR	78.2		P	50 - 300
2081742	GULL2-qPCR	77.5		P	50 - 300
2081744	GULL2-qPCR	83.1		P	50 - 300
2081745	GULL2-qPCR	119		P	50 - 300
2082148	GULL2-qPCR	77.8		P	50 - 300
2082749	GULL2-qPCR	44.7		F	50 - 300
2084686	GULL2-qPCR	69.2	79.0	P/P	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.3

Batch ID: P364444

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2078652	GFD-purified-qPCR	214		F	50 - 175
2078653	GFD-purified-qPCR	369		F	50 - 175
2078663	GFD-purified-qPCR	330		F	50 - 175
2080143	GFD-purified-qPCR	363	316	F/F	50 - 175
2081742	GFD-purified-qPCR	364		F	50 - 175
2081744	GFD-purified-qPCR	262		F	50 - 175
2081745	GFD-purified-qPCR	291		F	50 - 175
2082148	GFD-purified-qPCR	341		F	50 - 175
2082749	GFD-purified-qPCR	316		F	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P363642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2078652	BacR-qPCR	65.5		P	50 - 175
2078653	BacR-qPCR	73.1		P	50 - 175
2078663	BacR-qPCR	66.6		P	50 - 175
2080143	BacR-qPCR	63.1		P	50 - 175
2081742	BacR-qPCR	76.3		P	50 - 175
2081744	BacR-qPCR	60.5		P	50 - 175
2081745	BacR-qPCR	78.1		P	50 - 175
2082148	BacR-qPCR	59.1		P	50 - 175
2082749	BacR-qPCR	53.3		P	50 - 175
2084686	BacR-qPCR	59.9	62.6	P/P	50 - 175
2085190	BacR-qPCR	65.6		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)

Batch ID: P363091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2078590	Chlorophyll-a, Corrected	6.86	Sample	P	0 - 25
2078590	Chlorophyll-a, Uncorrected	5.62	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0

Batch ID: P363642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084686	HF183-qPCR	12.5	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2

Batch ID: P363642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084686	GULL2-qPCR	13.2	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.3
Batch ID: P364444

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080143	GFD-purified-qPCR	13.9	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P363642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084686	BacR-qPCR	4.42	Spike	P	0 - 25

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Surrogates

Lab Sample ID: 2078652
Field Sample ID: G1SW0051

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	106	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	98.7	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	102	P	50 - 300

Lab Sample ID: 2078653
Field Sample ID: G5SW0129

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	109	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	98.4	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	98.1	P	50 - 300

Lab Sample ID: 2078663
Field Sample ID: G5SW0147

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	95.3	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	98.7	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	ChlorophyllI-a, Corrected	94.5						6.86	
	ChlorophyllI-a, Uncorrected							5.62	
SOP-PCR-1.0	HF183-qPCR	145	117	96.2	109	104			12.5
				101					
SOP-PCR-1.2	GULL2-qPCR	84.7	104	69.2	79.0	87.0			13.2
				118					

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SOP-PCR-1.3	GFD-purified-qPCR	59.4	115	214	369	330		13.9
SOP-PCR-1.4	BacR-qPCR	85.1	84.4	59.9	62.6	65.5		4.42
				363				
				73.1				

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
Enterolert/QT / E84167	Enterococci by Enterolert Quanti-Tray method by Benchmark EnviroAnalytical in Palmetto	2078655
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2078650, 2078651
SM 9223 B Quanti-Tray / E84167	Escherichia coli by Colilert Quanti-Tray method by Benchmark EnviroAnalytical in Palmetto	2078654, 2078656
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2078652, 2078653, 2078663
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2078652, 2078653, 2078663
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2078652, 2078653, 2078663
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2078652, 2078653, 2078663
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2078652, 2078653, 2078663

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	04/16/2019	04/16/2019 14:15		04/17/2019 15:06	Benchmark EnviroAnalytical - Palmetto	2078655
SM 10200 H (mod.)	04/17/2019	04/17/2019 13:30	Edwin Gonzalez-Soto	04/29/2019 15:45	Carina A. Tull	2078650, 2078651
SM 9223 B Quanti-Tray	04/16/2019	04/16/2019 14:29		04/17/2019 15:08	Benchmark EnviroAnalytical - Palmetto	2078654, 2078656
SOP-PCR-1.0	04/17/2019	04/18/2019 09:20	Angela Smith	05/21/2019 13:19	Mailin Lopez	2078652, 2078653, 2078663
SOP-PCR-1.2	04/17/2019	04/18/2019 09:20	Angela Smith	05/23/2019 11:45	Sarah Menz	2078652, 2078653, 2078663
SOP-PCR-1.3	04/17/2019	04/18/2019 09:20	Sarah Menz	05/28/2019 09:45	Sarah Menz	2078652, 2078653, 2078663
SOP-PCR-1.4	04/17/2019	04/18/2019 09:20	Angela Smith	05/22/2019 15:47	Sarah Menz	2078652, 2078653, 2078663
SOP-PCR-4.0	04/17/2019	04/18/2019 09:20	Angela Smith	05/13/2019 08:33	Sarah Menz	2078652, 2078653, 2078663