

Biological Analysis Report

CEN-DIST-2019-02-08-03

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

Overflow Analyses Performed By:
Environmental Research & Design, Inc
3419 Trentwood Blvd.
Suite 102
Belle Isle (Orlando), FL 32812-4864
DOH Accreditation E1031026

Event Description: **Soldier / salt / Black Hammock**
Request ID: **RQ-2019-02-04-55**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Jacqueline Savage, Environmental Administrator

Date Certified: 12-MAR-2019 13:07

A handwritten signature in black ink that reads "Jackie Savage". The signature is written in a cursive, flowing style.

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: Salt Creek @ Packard Ave

Collection Date/Time: 02/07/2019 11:30

Field ID: G2CE0088

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2061280	EPA 1603	Escherichia coli-Membrane Filter	660		cfu/100 mL		
2061285	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P359614	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P359614	
	SOP-PCR-1.3	GFD-purified-qPCR**	9.50E+03	J	TSC/100 mL	P359877	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P359614	LCS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P358575	

Ref. Method and Comment:

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

SOP-PCR-1.4: Precision data unavailable for Analysis Batch A89879

Sample Location: Soldier Creek @ 150m Upstream of SR Hwy 419 **Collection Date/Time: 02/07/2019 10:25**

Field ID: G2CE0071

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2061279	EPA 1603	Escherichia coli-Membrane Filter	153		cfu/100 mL		
2061283	SM 10200 H (mod.)	Chlorophyll-a, Corrected	5.3		ug/L	P359460	
		Phaeophytin-a	0.88	I	ug/L	P359460	
		Chlorophyll-a, Uncorrected	6.0		ug/L	P359460	
2061284	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold			P358575	

Sample Location: Sweetwater Creek @ Florida Ave

Collection Date/Time: 02/07/2019 11:00

Field ID: G2CE0123

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2061281	EPA 1603	Escherichia coli-Membrane Filter	340		cfu/100 mL		
2061286	SOP-PCR-1.0	HF183-qPCR**	240	I	GEU/100 mL	P358312	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P358312	

Sample Location: Sweetwater Creek @ Kansas St

Collection Date/Time: 02/07/2019 11:10

Field ID: G2CE0194

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2061282	EPA 1603	Escherichia coli-Membrane Filter	294		cfu/100 mL		
2061287	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P358312	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P358312	

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P359460

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.62	U	ug/L
Chlorophyll-a, Uncorrected	0.45	U	ug/L
Phaeophytin-a	0.68	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
 Batch ID: P358312

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

Reference Method: SOP-PCR-1.0
 Batch ID: P359614

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

Reference Method: SOP-PCR-1.2
 Batch ID: P359614

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

Reference Method: SOP-PCR-1.3
 Batch ID: P359877

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

Reference Method: SOP-PCR-1.4
 Batch ID: P358312

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

Reference Method: SOP-PCR-1.4
 Batch ID: P359614

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: P359460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	106		P	84 - 116

Reference Method: SOP-PCR-1.0
 Batch ID: P358312

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	108	124	P/P	50 - 175

Reference Method: SOP-PCR-1.0
 Batch ID: P359614

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P359614

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	99.1	144	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P359614

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	162	160	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P359877

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	186	42.1	F/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P358312

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

Reference Method: SOP-PCR-1.4
Batch ID: P359614

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	95.1	43.2	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P358312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2058130	HF183-qPCR	84.8		P	50 - 175
2058447	HF183-qPCR	63.6		P	50 - 175
2058484	HF183-qPCR	86.3		P	50 - 175
2058676	HF183-qPCR	61.5		P	50 - 175
2058677	HF183-qPCR	65.5		P	50 - 175
2059328	HF183-qPCR	93.6		P	50 - 175
2059330	HF183-qPCR	75.8		P	50 - 175
2059331	HF183-qPCR	91.4		P	50 - 175
2059332	HF183-qPCR	97.2	96.9	P/P	50 - 175
2060474	HF183-qPCR	109		P	50 - 175
2060793	HF183-qPCR	89.4		P	50 - 175
2061286	HF183-qPCR	91.4		P	50 - 175
2061287	HF183-qPCR	88.0		P	50 - 175

Reference Method: SOP-PCR-1.0
Batch ID: P359614

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P359614

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2058248	HF183-qPCR	87.8		P	50 - 175
2058249	HF183-qPCR	91.8		P	50 - 175
2060595	HF183-qPCR	84.7		P	50 - 175
2060596	HF183-qPCR	74.6		P	50 - 175
2061285	HF183-qPCR	75.4		P	50 - 175
2061793	HF183-qPCR	83.7		P	50 - 175
2062154	HF183-qPCR	87.4		P	50 - 175
2065681	HF183-qPCR	94.8		P	50 - 175
2065682	HF183-qPCR	88.6		P	50 - 175
2065683	HF183-qPCR	98.9		P	50 - 175
2065684	HF183-qPCR	94.1	94.5	P/P	50 - 175
2066123	HF183-qPCR	79.3		P	50 - 175
2066124	HF183-qPCR	83.0		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P359614

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2058248	GULL2-qPCR	173		P	50 - 300
2058249	GULL2-qPCR	175		P	50 - 300
2060595	GULL2-qPCR	151		P	50 - 300
2060596	GULL2-qPCR	163		P	50 - 300
2061285	GULL2-qPCR	140		P	50 - 300
2061793	GULL2-qPCR	137		P	50 - 300
2062154	GULL2-qPCR	157		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P359877

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2060595	GFD-purified-qPCR	918		F	50 - 175
2060596	GFD-purified-qPCR	817		F	50 - 175
2061285	GFD-purified-qPCR	795		F	50 - 175
2061793	GFD-purified-qPCR	839		F	50 - 175
2067629	GFD-purified-qPCR	797	808	F/F	50 - 175
2067943	GFD-purified-qPCR	736		F	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P358312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2058130	BacR-qPCR	80.4		P	50 - 175
2058447	BacR-qPCR	83.5		P	50 - 175
2058484	BacR-qPCR	86.1		P	50 - 175
2058676	BacR-qPCR	75.7		P	50 - 175
2058677	BacR-qPCR	70.1		P	50 - 175
2059328	BacR-qPCR	68.1		P	50 - 175
2059330	BacR-qPCR	63.0		P	50 - 175
2059331	BacR-qPCR	72.6		P	50 - 175
2059332	BacR-qPCR	101	100	P/P	50 - 175
2060474	BacR-qPCR	97.9		P	50 - 175
2060793	BacR-qPCR	89.8		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
 Batch ID: P358312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2061286	BacR-qPCR	91.1		P	50 - 175
2061287	BacR-qPCR	88.9		P	50 - 175

Reference Method: SOP-PCR-1.4
 Batch ID: P359614

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2058248	BacR-qPCR	81.5		P	50 - 175
2058249	BacR-qPCR	82.6		P	50 - 175
2060595	BacR-qPCR	71.7		P	50 - 175
2060596	BacR-qPCR	73.4		P	50 - 175
2061285	BacR-qPCR	67.2		P	50 - 175
2061793	BacR-qPCR	70.9		P	50 - 175
2062154	BacR-qPCR	77.7		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
 Batch ID: P359460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2060791	Chlorophyll-a, Corrected	3.67	Sample	P	0 - 25
2060791	Chlorophyll-a, Uncorrected	3.03	Sample	P	0 - 25
2060791	Phaeophytin-a	2.32	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
 Batch ID: P358312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2059332	HF183-qPCR	0.315	Spike	P	0 - 25

Reference Method: SOP-PCR-1.0
 Batch ID: P359614

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2065684	HF183-qPCR	0.427	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P359614

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063185	GULL2-qPCR	17.6	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.3
 Batch ID: P359877

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2067629	GFD-purified-qPCR	1.38	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P358312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2059332	BacR-qPCR	0.749	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: 2061285
 Field Sample ID: G2CE0088

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	98.5	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	91.5	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	92.2	P	50 - 300

Lab Sample ID: 2061286
 Field Sample ID: G2CE0123

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	103	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	99.6	P	50 - 300

Lab Sample ID: 2061287
 Field Sample ID: G2CE0194

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	97.3	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	99.1	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	106						3.67	
	Chlorophyll-a, Uncorrected							3.03	
	Phaeophytin-a							2.32	
SOP-PCR-1.0	HF183-qPCR	124	108	93.6	75.8	91.4			0.315
	HF183-qPCR	144	99.1	94.8	88.6	98.9			0.427
				94.1					

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.2	GULL2-qPCR	160	162	173	175	157			17.6
SOP-PCR-1.3	GFD-purified-qPCR	42.1	186	918	817	795			1.38
SOP-PCR-1.4	BacR-qPCR	102	102	68.1	63.0	72.6			0.749
	BacR-qPCR	43.2	95.1	81.5	82.6	77.7			
				101					
				71.7					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 1603 / E1031026	Escherichia coli by membrane filter method by ERD Laboratory	2061279, 2061280, 2061281, 2061282
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2061283
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2061285, 2061286, 2061287
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2061285
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2061285
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2061285, 2061286, 2061287
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2061284, 2061285

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 1603	02/07/2019	02/07/2019 15:10		02/08/2019 15:10	Environmental Research & Design, Inc.	2061279, 2061280, 2061281, 2061282
SM 10200 H (mod.)	02/08/2019	02/08/2019 15:00	Jennifer Mihalic	02/18/2019 14:15	Carina A. Tull	2061283
SOP-PCR-1.0	02/08/2019	02/08/2019 13:35	Angela Smith	02/26/2019 11:19	Mailin Lopez	2061286, 2061287
	02/08/2019	02/08/2019 13:35	Angela Smith	03/07/2019 08:59	Mailin Lopez	2061285
SOP-PCR-1.2	02/08/2019	02/08/2019 13:35	Angela Smith	03/08/2019 11:03	Mailin Lopez	2061285
SOP-PCR-1.3	02/08/2019	02/08/2019 13:35	Mailin Lopez	03/11/2019 13:28	Sarah Menz	2061285
SOP-PCR-1.4	02/08/2019	02/08/2019 13:35	Angela Smith	02/27/2019 11:28	Mailin Lopez	2061286, 2061287
	02/08/2019	02/08/2019 13:35	Angela Smith	03/07/2019 13:38	Mailin Lopez	2061285
SOP-PCR-4.0	02/08/2019	02/08/2019 13:35	Angela Smith	03/06/2019 10:40	Sarah Menz	2061284, 2061285