

Biological Analysis Report

SE-DIST-2018-10-03-01

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

Overflow Analyses Performed By:
Flowers Chemical Laboratories Inc.
571 NW Mercantile Pl. Ste. 111
Port St. Lucie, FL 34986
DOH Accreditation E86562

Event Description: **SMP- Fort Pierce**
Request ID: **RQ-2018-09-24-16**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

For additional information please contact
Cheryl Swanson - Administrator
J. Marshall Faircloth - Aquatic Toxicology
Jacqueline Savage - Bench Biology
Jacqueline Savage - Microbiology
Puja Jasrotia, Ph.D. - Molecular Biology
Amelia Rankin - Taxonomy (Invertebrate & Algal)
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8177

Certified by: Amelia G. Rankin,

Date Certified: 20-NOV-2018 10:01



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 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: C-25 Canal West @ Godwin

Collection Date/Time: 10/02/2018 10:45

Field ID: G2SE0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2030623	SM 10200 H (mod.)	Chlorophyll-a, Corrected	11		ug/L	P353397	
		Phaeophytin-a	4.5		ug/L	P353397	
		Chlorophyll-a, Uncorrected	14		ug/L	P353397	
2030630	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	3.10		MPN/100 mL		

Sample Location: Moores Creek @ 2nd

Collection Date/Time: 10/02/2018 11:30

Field ID: G2SE0025

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2030626	SM 10200 H (mod.)	Chlorophyll-a, Corrected	12		ug/L	P353397	
		Phaeophytin-a	0.60	U	ug/L	P353397	
		Chlorophyll-a, Uncorrected	13		ug/L	P353397	
2030628	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P353540	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	UJ	TSC/100 mL	P353540	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	370	I	TSC/100 mL	P354126	LCS, MS, RPD
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P353540	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
2030633	Enterolert/QT	Enterococci-Quanti-Tray	13000		MPN/100 mL		

Ref. Method and Comment:

SOP-PCR-1.2: Precision data unavailable for Analysis Batch A87595. Quality control failure(s) observed. See QA report for details.

SOP-PCR-1.4: Precision data unavailable for Analysis Batch A87551

Sample Location: Moores Creek @ 7th

Collection Date/Time: 10/02/2018 12:05

Field ID: G2SE0016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2030627	SM 10200 H (mod.)	Chlorophyll-a, Corrected	4.4		ug/L	P353397	
		Phaeophytin-a	1.0	I	ug/L	P353397	
		Chlorophyll-a, Uncorrected	5.1		ug/L	P353397	
2030629	SOP-PCR-1.0	HF183-qPCR**	360	I	GEU/100 mL	P353540	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
2030634	Enterolert/QT	Enterococci-Quanti-Tray	512		MPN/100 mL		

Sample Location: Five-mile Creek @ Okeechobee

Collection Date/Time: 10/02/2018 12:40

Field ID: G2SE0008

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2030625	SM 10200 H (mod.)	Chlorophyll-a, Corrected	7.8		ug/L	P353397	
		Phaeophytin-a	2.0		ug/L	P353397	
		Chlorophyll-a, Uncorrected	9.4		ug/L	P353397	
2030632	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	980		MPN/100 mL		

Sample Location: Ten-mile Creek @ Gordy

Collection Date/Time: 10/02/2018 13:10

Field ID: G2SE0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
-----------	-------------	-----------	--------	------	-------	----------	----------

Field ID: G2SE0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2030624	SM 10200 H (mod.)	Chlorophyll-a, Corrected	38		ug/L	P353397	
		Phaeophytin-a	3.3		ug/L	P353397	
		Chlorophyll-a, Uncorrected	41		ug/L	P353397	
2030631	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	44.1		MPN/100 mL		

Quality Assurance Report
Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P353397

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

Reference Method: SOP-PCR-1.0
Batch ID: P353540

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

Reference Method: SOP-PCR-1.2
Batch ID: P353540

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

Reference Method: SOP-PCR-1.3
Batch ID: P354126

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

Reference Method: SOP-PCR-1.4
Batch ID: P353540

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: P353397

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	90.9		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P353540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	117	170	P/P	50 - 175

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.2
Batch ID: P353540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	102	116	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P354126

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	145	32.4	P/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P353540

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	102	156	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P353540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2030526	HF183-qPCR	104		P	50 - 175
2030527	HF183-qPCR	113		P	50 - 175
2030628	HF183-qPCR	112		P	50 - 175
2030629	HF183-qPCR	108		P	50 - 175
2031964	HF183-qPCR	110		P	50 - 175
2031965	HF183-qPCR	98.7		P	50 - 175
2031970	HF183-qPCR	115		P	50 - 175
2038163	HF183-qPCR	124		P	50 - 175
2038164	HF183-qPCR	117	111	P/P	50 - 175
2038796	HF183-qPCR	91.2		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P353540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2030527	GULL2-qPCR	68.6		P	50 - 300
2030628	GULL2-qPCR	48.9		F	50 - 300
2031964	GULL2-qPCR	66.0		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P354126

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2030527	GFD-purified-qPCR	123		P	50 - 175
2030628	GFD-purified-qPCR	109		P	50 - 175
2031964	GFD-purified-qPCR	111		P	50 - 175
2032849	GFD-purified-qPCR	141		P	50 - 175
2038796	GFD-purified-qPCR	208	147	F/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
 Batch ID: P353540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2030527	BacR-qPCR	88.5		P	50 - 175
2030628	BacR-qPCR	74.0		P	50 - 175
2031964	BacR-qPCR	75.3		P	50 - 175
2031970	BacR-qPCR	70.6		P	50 - 175
2036857	BacR-qPCR	82.4		P	50 - 175
2038163	BacR-qPCR	76.9		P	50 - 175
2038796	BacR-qPCR	59.6		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
 Batch ID: P353397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2030503	Chlorophyll-a, Corrected	0.725	Sample	P	0 - 25
2030503	Chlorophyll-a, Uncorrected	0.519	Sample	P	0 - 25
2030503	Phaeophytin-a	6.88	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
 Batch ID: P353540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038164	HF183-qPCR	4.98	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P354126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038796	GFD-purified-qPCR	34.2	Spike	F	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: 2030628
 Field Sample ID: G2SE0025

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	97.1	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	102	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	139	P	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 2030629
Field Sample ID: G2SE0016

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	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	90.9			0.725	
	Chlorophyll-a, Uncorrected				0.519	
	Phaeophytin-a				6.88	
SOP-PCR-1.0	HF183-qPCR	170 117	104 113 112 108			4.98
SOP-PCR-1.2	GULL2-qPCR	116 102	68.6 48.9 66.0			
SOP-PCR-1.3	GFD-purified-qPCR	32.4 145	208 147 123 109			34.2
SOP-PCR-1.4	BacR-qPCR	156 102	88.5 74.0 75.3 70.6			

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
Enterolert/QT / E86562	Enterococci by Enterolert Quanti-Tray method by Flowers Chemical Laboratory in Port St. Lucie	2030633, 2030634
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2030623, 2030624, 2030625, 2030626, 2030627
SM 9223 B Quanti-Tray / E86562	Escherichia coli by Colilert 18 Quanti-Tray method by Flowers Chemical Laboratory in Port St. Lucie	2030630, 2030631, 2030632
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2030628, 2030629
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2030628
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2030628
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2030628
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2030628, 2030629

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	10/02/2018	10/02/2018 15:10		10/03/2018 17:05	Flowers-PSL	2030633, 2030634
SM 10200 H (mod.)	10/03/2018	10/03/2018 14:57	Mariam Hanna	10/18/2018 10:35	Peterson Janvier	2030623, 2030624, 2030625, 2030626, 2030627
SM 9223 B Quanti-Tray	10/02/2018	10/02/2018 15:20		10/03/2018 09:45	Flowers-PSL	2030630, 2030631, 2030632
SOP-PCR-1.0	10/03/2018	10/03/2018 13:30	Sarah Menz	11/05/2018 15:31	Mailin Lopez	2030628, 2030629
SOP-PCR-1.2	10/03/2018	10/03/2018 13:30	Sarah Menz	11/07/2018 09:59	Mailin Lopez	2030628
SOP-PCR-1.3	10/03/2018	10/03/2018 13:30	Angela Smith	11/07/2018 15:48	Sarah Menz	2030628
SOP-PCR-1.4	10/03/2018	10/03/2018 13:30	Sarah Menz	11/06/2018 10:40	Mailin Lopez	2030628
SOP-PCR-4.0	10/03/2018	10/03/2018 13:30	Angela Smith	10/25/2018 09:21	Sarah Menz	2030628, 2030629