

Biological Analysis Report

SE-DIST-2018-04-05-01

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- Okeechobee Run**
Request ID: **RQ-2018-03-19-12**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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2199 South Rock Road
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Certified by: Jacqueline Savage, Environmental Manager

Date Certified: 29-MAY-2018 10:32

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 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: Otter Creek @ 68

Collection Date/Time: 04/04/2018 11:00

Field ID: G1SE0003

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1981610	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1981624	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	317		MPN/100 mL		

Sample Location: Otter Creek @ 441

Collection Date/Time: 04/04/2018 10:35

Field ID: G1SE0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1981611	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1981625	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	331		MPN/100 mL		

Sample Location: Taylor Creek @ 441

Collection Date/Time: 04/04/2018 11:25

Field ID: G1SE0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1981593	SM 10200 H (mod.)	Chlorophyll-a, Corrected	29		ug/L	P343483	
		Phaeophytin-a	3.1		ug/L	P343483	
		Chlorophyll-a, Uncorrected	32		ug/L	P343483	
1981612	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1981626	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	10.0	U	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: Popash @ 70

Collection Date/Time: 04/04/2018 12:00

Field ID: G1SE0017

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1981595	SM 10200 H (mod.)	Chlorophyll-a, Corrected	8.4		ug/L	P343483	
		Phaeophytin-a	3.2		ug/L	P343483	
		Chlorophyll-a, Uncorrected	11		ug/L	P343483	
1981628	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	1990		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: Taylor Creek @ 70

Collection Date/Time: 04/04/2018 13:00

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1981594	SM 10200 H (mod.)	Chlorophyll-a, Corrected	180		ug/L	P343483	
		Phaeophytin-a	19		ug/L	P343483	
		Chlorophyll-a, Uncorrected	200		ug/L	P343483	
1981613	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1981627	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	122		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: Mosquito Creek @ 70

Collection Date/Time: 04/04/2018 13:25

Field ID: G1SE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1981614	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P344842	
	SOP-PCR-1.4	BacR-qPCR**	1.19E+06		TSC/100 mL	P344842	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1981629	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	2190		MPN/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.0: No amplification of HF183 marker.

Sample Location: Mosquito Creek @ 710

Collection Date/Time: 04/04/2018 14:00

Field ID: G1SE0014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1981615	SOP-PCR-1.0	HF183-qPCR**	190	U	GEU/100 mL	P344842	
	SOP-PCR-1.4	BacR-qPCR**	4.1E+03	I	TSC/100 mL	P344842	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1981630	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	663		MPN/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.0: No amplification of HF183 marker.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P343483

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.55	U	ug/L
Chlorophyll-a, Uncorrected	0.40	U	ug/L
Phaeophytin-a	0.40	U	ug/L

Reference Method: SOP-PCR-1.0

Batch ID: P344842

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

Reference Method: SOP-PCR-1.4

Batch ID: P344842

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: P343483

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	87.3		P	84 - 116

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P344842

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	120	104	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P344842

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	79.2	83.3	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P344842

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978108	HF183-qPCR	79.3		P	50 - 175
1980236	HF183-qPCR	78.4		P	50 - 175
1980237	HF183-qPCR	91.2		P	50 - 175
1980276	HF183-qPCR	109		P	50 - 175
1981021	HF183-qPCR	107		P	50 - 175
1981614	HF183-qPCR	95.0		P	50 - 175
1981615	HF183-qPCR	93.9		P	50 - 175
1981701	HF183-qPCR	98.1		P	50 - 175
1981702	HF183-qPCR	106		P	50 - 175
1986512	HF183-qPCR	123		P	50 - 175
1991711	HF183-qPCR	106		P	50 - 175
1991712	HF183-qPCR	101	101	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P344842

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978108	BacR-qPCR	68.0		P	50 - 175
1981021	BacR-qPCR	56.1		P	50 - 175
1981614	BacR-qPCR	63.3		P	50 - 175
1981615	BacR-qPCR	56.3		P	50 - 175
1991711	BacR-qPCR	50.6		P	50 - 175
1991712	BacR-qPCR	75.1	62.2	P/P	50 - 175
1991823	BacR-qPCR	72.7		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P344842

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1991712	HF183-qPCR	0.390	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.4
Batch ID: P344842

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1991712	BacR-qPCR	18.8	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: 1981614
Field Sample ID: G1SE0006

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	110	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	100	P	50 - 300

Lab Sample ID: 1981615
Field Sample ID: G1SE0014

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	118	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	103	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	87.3							
SOP-PCR-1.0	HF183-qPCR	104	120	123	79.3	106			0.390
				101					
SOP-PCR-1.4	BacR-qPCR	83.3	79.2	68.0	50.6	75.1			18.8
				62.2					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	1981593, 1981594, 1981595
SM 9223 Quanti-Tray / E86562	Escherichia coli by Colilert 18 Quanti-Tray method by FlowersOverflow Laboratory for Southeast District	1981624, 1981625, 1981626, 1981627, 1981628, 1981629, 1981630
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1981614, 1981615
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	1981614, 1981615
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	1981610, 1981611, 1981612, 1981613, 1981614, 1981615

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	04/05/2018	04/05/2018 14:45	Edwin Gonzalez-Soto	04/16/2018 09:10	Amelia G. Rankin	1981593, 1981594, 1981595
SM 9223 Quanti-Tray	04/04/2018	04/04/2018 16:00		04/05/2018 11:55	Flowers-PSL	1981624, 1981625, 1981626, 1981627, 1981628, 1981629, 1981630
SOP-PCR-1.0	04/05/2018	04/05/2018 13:30	Sarah Menz	05/15/2018 12:52	Sarah Menz	1981614, 1981615
SOP-PCR-1.4	04/05/2018	04/05/2018 13:30	Sarah Menz	05/16/2018 12:10	Sarah Menz	1981614, 1981615
SOP-PCR-4.0	04/05/2018	04/05/2018 13:30	Angela Smith	05/14/2018 15:47	Puja Jasrotia	1981610, 1981611, 1981612, 1981613, 1981614, 1981615