

Biological Analysis Report

SE-DIST-2017-07-19-01

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-G1 Okeechobee Run**
Request ID: **RQ-2017-07-10-10**
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
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Certified by: Cheryl A. Swanson, Environmental Manager

Date Certified: 01-SEP-2017 10:21



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 @ 441

Collection Date/Time: 07/18/2017 09:40

Field ID: G1SE0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1914271	SM 10200 H (mod.)	Chlorophyll-a, Corrected	7.5		ug/L	P328934	
		Phaeophytin-a	30.7		ug/L	P328934	
		Chlorophyll/Phaeophytin Ratio	1.1			P328934	
		Chlorophyll-a, Uncorrected	26.1		ug/L	P328934	
1914276	SOP-PCR-1.0	HF183-purified-qPCR**	30	IJ	GEU/100 mL	P328794	LCS, SUR
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1914283	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	445		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-1.0: Quality control failure(s) observed. See QA report for details.

Sample Location: POPASH SLOUGH @ SR-70

Collection Date/Time: 07/18/2017 10:15

Field ID: G1SE0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1914264	SM 10200 H (mod.)	Chlorophyll-a, Corrected	14.7		ug/L	P328933	
		Phaeophytin-a	1.2	I	ug/L	P328933	
		Chlorophyll/Phaeophytin Ratio	1.6			P328933	
		Chlorophyll-a, Uncorrected	15.9		ug/L	P328933	

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 @ SR-70

Collection Date/Time: 07/18/2017 10:40

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1914268	SM 10200 H (mod.)	Chlorophyll-a, Corrected	73.8		ug/L	P328934	
		Phaeophytin-a	20.2		ug/L	P328934	
		Chlorophyll/Phaeophytin Ratio	1.5			P328934	
		Chlorophyll-a, Uncorrected	88.4		ug/L	P328934	
1914273	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1914280	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	134		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 @ SR-70_DUP

Collection Date/Time: 07/18/2017 10:50

Field ID: G1SE0011_DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1914269	SM 10200 H (mod.)	Chlorophyll-a, Corrected	77.0		ug/L	P328934	
		Phaeophytin-a	27.2		ug/L	P328934	
		Chlorophyll/Phaeophytin Ratio	1.5			P328934	
		Chlorophyll-a, Uncorrected	96.0		ug/L	P328934	
1914274	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1914281	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	187		MPN/100 mL		

Field ID: G1SE0011_DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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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 @ SR 710

Collection Date/Time: 07/18/2017 11:10

Field ID: G1SE0014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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1914267	SM 10200 H (mod.)	Chlorophyll-a, Corrected	4.5		ug/L	P328934	
		Phaeophytin-a	2.4		ug/L	P328934	
		Chlorophyll/Phaeophytin Ratio	1.5			P328934	
		Chlorophyll-a, Uncorrected	6.1		ug/L	P328934	
1914272	SOP-PCR-1.0	HF183-qPCR**	12	T	GEU/100 mL	P330498	LCS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1914279	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	498		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: NUBBIN SLOUGH

Collection Date/Time: 07/18/2017 11:25

Field ID: G1SE0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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1914265	SM 10200 H (mod.)	Chlorophyll-a, Corrected	4.0		ug/L	P328933	
		Phaeophytin-a	0.84	I	ug/L	P328933	
		Chlorophyll/Phaeophytin Ratio	1.6			P328933	
		Chlorophyll-a, Uncorrected	4.6		ug/L	P328933	
1914277	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	29.6		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: HENRY CREEK @ HWY 710

Collection Date/Time: 07/18/2017 11:35

Field ID: G1SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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1914270	SM 10200 H (mod.)	Chlorophyll-a, Corrected	19.1		ug/L	P328934	
		Phaeophytin-a	2.0		ug/L	P328934	
		Chlorophyll/Phaeophytin Ratio	1.6			P328934	
		Chlorophyll-a, Uncorrected	21.1		ug/L	P328934	
1914275	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1914282	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	172		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: LETTUCE CREEK @ HWY 710

Collection Date/Time: 07/18/2017 11:55

Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1914266	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.4		ug/L	P328934	
		Phaeophytin-a	1.7		ug/L	P328934	
		Chlorophyll/Phaeophytin Ratio	1.4			P328934	
		Chlorophyll-a, Uncorrected	3.6		ug/L	P328934	
1914278	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	384		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: P328933

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: SM 10200 H (mod.)
Batch ID: P328934

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: P328794

Component	Result	Code	Units
HF183-purified-qPCR	47	U	GEU/100 mL

Reference Method: SOP-PCR-1.0
Batch ID: P330498

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P328933

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	107		P	84 - 116

Reference Method: SM 10200 H (mod.)
Batch ID: P328934

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	107		P	84 - 116

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P328794

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-purified-qPCR	98.4	8.66	P/F	50 - 175

Reference Method: SOP-PCR-1.0
Batch ID: P330498

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	93.0	2.05	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P328794

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912909	HF183-purified-qPCR	100		P	50 - 175
1913036	HF183-purified-qPCR	114		P	50 - 175
1914276	HF183-purified-qPCR	95.8		P	50 - 175
1915212	HF183-purified-qPCR	94.2		P	50 - 175

Reference Method: SOP-PCR-1.0
Batch ID: P330498

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1914272	HF183-qPCR	79.4		P	50 - 175
1914985	HF183-qPCR	78.6		P	50 - 175
1915515	HF183-qPCR	70.8		P	50 - 175
1915994	HF183-qPCR	71.6		P	50 - 175
1915995	HF183-qPCR	69.3		P	50 - 175
1915996	HF183-qPCR	82.1		P	50 - 175
1916673	HF183-qPCR	88.5		P	50 - 175
1917382	HF183-qPCR	84.6		P	50 - 175
1922728	HF183-qPCR	81.7		P	50 - 175
1922729	HF183-qPCR	62.3		P	50 - 175
1922730	HF183-qPCR	90.6		P	50 - 175
1922731	HF183-qPCR	71.8		P	50 - 175
1922804	HF183-qPCR	73.0	67.8	P/P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P328933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1913973	Chlorophyll/Phaeophytin Ratio	0.0	Sample	P	0 - 25
1913973	Chlorophyll-a, Corrected	10.3	Sample	P	0 - 25
1913973	Chlorophyll-a, Uncorrected	8.20	Sample	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P328794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916651	HF183-purified-qPCR	8.29	Spike	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P330498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1922804	HF183-qPCR	7.29	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: 1914272
Field Sample ID: G1SE0014

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	94.1	P	50 - 300

Lab Sample ID: 1914276
Field Sample ID: G1SE0007

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	7.95	F	30 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll/Phaeophytin Ratio							0.0	
	Chlorophyll-a, Corrected	107						10.3	
	Chlorophyll-a, Corrected	107							
	Chlorophyll-a, Uncorrected							8.20	
SOP-PCR-1.0	HF183-purified-qPCR	8.66	98.4	100	114	95.8			8.29
				94.2					
	HF183-qPCR	2.05	93.0	84.6	81.7	62.3			7.29
				90.6					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	1914264, 1914265, 1914266, 1914267, 1914268, 1914269, 1914270, 1914271
SM 9223 Quanti-Tray / E86562	Escherichia coli by Colilert 18 Quanti-Tray method by FlowersOverflow Laboratory for Southeast District	1914277, 1914278, 1914279, 1914280, 1914281, 1914282, 1914283
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1914272

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1914276
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	1914272, 1914273, 1914274, 1914275, 1914276

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	07/19/2017	07/19/2017 12:45	Morgan Lane	07/20/2017	Jennifer Mihalic	1914264, 1914265, 1914266, 1914267, 1914268, 1914269, 1914270, 1914271
SM 9223 Quanti-Tray	07/18/2017			07/18/2017 14:40	Flowers-PSL	1914277, 1914278, 1914279, 1914280, 1914281, 1914282, 1914283
SOP-PCR-1.0	07/19/2017	07/19/2017 12:30	Puja Jasrotia	08/04/2017	Sarah Menz	1914276
	07/19/2017	07/19/2017 12:30	Puja Jasrotia	08/24/2017	Puja Jasrotia	1914272
SOP-PCR-4.0	07/19/2017	07/19/2017 12:30	Avril Wood	08/21/2017	Puja Jasrotia	1914272, 1914273, 1914274, 1914275, 1914276