

Biological Analysis Report

SE-DIST-2018-08-31-01

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-2018-08-27-35**
Customer: **SE-DIST**
Project ID: **SMP**

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Date Certified: 22-OCT-2018 13:06



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: 08/30/2018 10:00

Field ID: G2SE0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021422	SM 10200 H (mod.)	Chlorophyll-a, Corrected	11		ug/L	P351690	
		Phaeophytin-a	6.3		ug/L	P351690	
		Chlorophyll-a, Uncorrected	15		ug/L	P351690	
2021430	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	25.9		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: FORT PIERCE FARM CANAL @ TAYLOR DAIRY **Collection Date/Time: 08/30/2018 10:35**

Field ID: G2SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021423	SM 10200 H (mod.)	Chlorophyll-a, Corrected	26		ug/L	P351690	
		Phaeophytin-a	8.0		ug/L	P351690	
		Chlorophyll-a, Uncorrected	32		ug/L	P351690	
2021431	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	8.50		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: MOORES CREEK @ 7TH

Collection Date/Time: 08/30/2018 11:00

Field ID: G2SE0016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021426	SM 10200 H (mod.)	Chlorophyll-a, Corrected	7.5		ug/L	P351690	
		Phaeophytin-a	1.8		ug/L	P351690	
		Chlorophyll-a, Uncorrected	8.8		ug/L	P351690	
2021428	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P352672	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P352672	
	SOP-PCR-1.3	GFD-purified-qPCR**	1.30E+03		TSC/100 mL	P352926	MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P352672	LCS, MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
2021434	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	548		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: Duplicate was analyzed and result is 410 I.

Sample Location: MOORES CREEK @ 2nd

Collection Date/Time: 08/30/2018 11:55

Field ID: G2SE0025

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021427	SM 10200 H (mod.)	Chlorophyll-a, Corrected	25		ug/L	P351690	
		Phaeophytin-a	1.5		ug/L	P351690	
		Chlorophyll-a, Uncorrected	27		ug/L	P351690	
2021429	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P352672	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P352672	
	SOP-PCR-1.3	GFD-purified-qPCR**	190	I	TSC/100 mL	P352926	MS

Field ID: G2SE0025

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021429	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P352672	LCS, MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
2021435	Enterolert/QT	Enterococci-Quanti-Tray	24200	J	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.

Enterolert/QT: Result may be higher than reported

Sample Location: FIVE-MILE CREEK @ OKEECHOBEE

Collection Date/Time: 08/30/2018 12:15

Field ID: G2SE0008

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021425	SM 10200 H (mod.)	Chlorophyll-a, Corrected	6.8		ug/L	P351690	
		Phaeophytin-a	1.7		ug/L	P351690	
		Chlorophyll-a, Uncorrected	8.0		ug/L	P351690	
2021433	Enterolert/QT	Enterococci-Quanti-Tray	158		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: TEN-MILE CREEK @ GORDY

Collection Date/Time: 08/30/2018 12:40

Field ID: G2SE0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2021424	SM 10200 H (mod.)	Chlorophyll-a, Corrected	52		ug/L	P351690	
		Phaeophytin-a	5.7		ug/L	P351690	
		Chlorophyll-a, Uncorrected	57		ug/L	P351690	
2021432	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	39.3		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: P351690

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: P352672

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

Reference Method: SOP-PCR-1.2

Batch ID: P352672

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.2
Batch ID: P352672

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

Reference Method: SOP-PCR-1.3
Batch ID: P352926

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

Reference Method: SOP-PCR-1.4
Batch ID: P352672

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: P351690

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	89.8		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P352672

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	93.0	111	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P352672

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	110	74.3	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P352926

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	116	62.6	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P352672

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	90.6	215	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P352672

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020386	HF183-qPCR	65.7		P	50 - 175
2021428	HF183-qPCR	83.8	75.7	P/P	50 - 175
2021429	HF183-qPCR	82.9		P	50 - 175
2021682	HF183-qPCR	76.5		P	50 - 175
2021684	HF183-qPCR	63.8		P	50 - 175
2021685	HF183-qPCR	63.3		P	50 - 175
2025198	HF183-qPCR	96.2		P	50 - 175
2027905	HF183-qPCR	75.8		P	50 - 175
2028725	HF183-qPCR	91.8		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P352672

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021428	GULL2-qPCR	107	84.6	P/P	50 - 300
2021429	GULL2-qPCR	93.8		P	50 - 300
2025198	GULL2-qPCR	85.2		P	50 - 300
2028725	GULL2-qPCR	99.8		P	50 - 300
2030718	GULL2-qPCR	109		P	50 - 300
2030719	GULL2-qPCR	92.8		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P352926

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021221	GFD-purified-qPCR	94.3		P	50 - 175
2021428	GFD-purified-qPCR	76.4	62.9	P/P	50 - 175
2021429	GFD-purified-qPCR	71.7		P	50 - 175
2025116	GFD-purified-qPCR	53.0		P	50 - 175
2025192	GFD-purified-qPCR	98.8		P	50 - 175
2025198	GFD-purified-qPCR	88.3		P	50 - 175
2025925	GFD-purified-qPCR	98.1		P	50 - 175
2026344	GFD-purified-qPCR	92.3		P	50 - 175
2028725	GFD-purified-qPCR	191		F	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P352672

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2021428	BacR-qPCR	91.9	92.0	P/P	50 - 175
2021429	BacR-qPCR	88.1		P	50 - 175
2021682	BacR-qPCR	61.8		P	50 - 175
2021684	BacR-qPCR	46.9		F	50 - 175
2021685	BacR-qPCR	65.8		P	50 - 175
2025198	BacR-qPCR	100		P	50 - 175
2028725	BacR-qPCR	87.5		P	50 - 175

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P352672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021428	HF183-qPCR	10.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P352672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021428	GULL2-qPCR	23.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P352926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021428	GFD-purified-qPCR	19.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P352672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2021428	BacR-qPCR	0.131	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: 2021428
 Field Sample ID: G2SE0016

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	102	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	96.7	P	50 - 300

Lab Sample ID: 2021429
 Field Sample ID: G2SE0025

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	103	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	94.1	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision
				LCS SMP MS

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	89.8							
SOP-PCR-1.0	HF183-qPCR	111	93.0	96.2	75.8	65.7			10.2
				83.8					
SOP-PCR-1.2	GULL2-qPCR	74.3	110	85.2	109	92.8			23.2
				107					
SOP-PCR-1.3	GFD-purified-qPCR	62.6	116	94.3	53.0	98.8			19.2
				98.1					
SOP-PCR-1.4	BacR-qPCR	215	90.6	100	91.9	92.0			0.131
				88.1					

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	2021433, 2021435
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2021422, 2021423, 2021424, 2021425, 2021426, 2021427
SM 9223 B Quanti-Tray / E86562	Escherichia coli by Colilert 18 Quanti-Tray method by Flowers Chemical Laboratory in Port St. Lucie	2021430, 2021431, 2021432, 2021434
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2021428, 2021429
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2021428, 2021429
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2021428, 2021429
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2021428, 2021429
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2021428, 2021429

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	08/30/2018	08/30/2018 14:30		08/31/2018 14:50	Flowers-PSL	2021433, 2021435
SM 10200 H (mod.)	08/31/2018	08/31/2018 14:20	Mariam Hanna	09/12/2018 15:30	Carina A. Tull	2021422, 2021423, 2021424, 2021425, 2021426, 2021427
SM 9223 B Quanti-Tray	08/30/2018	08/30/2018 15:05		08/31/2018 09:45	Flowers-PSL	2021430, 2021431, 2021432, 2021434
SOP-PCR-1.0	08/31/2018	08/31/2018 13:15	Sarah Menz	10/08/2018 13:26	Mailin Lopez	2021428, 2021429
SOP-PCR-1.2	08/31/2018	08/31/2018 13:15	Sarah Menz	10/15/2018 10:23	Mailin Lopez	2021428, 2021429
SOP-PCR-1.3	08/31/2018	08/31/2018 13:15	Sarah Menz	10/16/2018 11:23	Sarah Menz	2021428, 2021429
SOP-PCR-1.4	08/31/2018	08/31/2018 13:15	Sarah Menz	10/08/2018 16:17	Sarah Menz	2021428, 2021429
SOP-PCR-4.0	08/31/2018	08/31/2018 13:15	Angela Smith	10/05/2018 13:59	Sarah Menz	2021428, 2021429