

Biological Analysis Report

SE-DIST-2018-06-21-01

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

Event Description: **SMP- Okeechobee Run**
Request ID: **RQ-2018-06-11-24**
Customer: **SE-DIST**
Project ID: **SMP**

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Date Certified: 20-JUL-2018 09:45



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, Microbiology and Molecular.

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: 06/20/2018 10:20

Field ID: G1SE0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002630	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	2419.6	Q	MPN/100 mL	P347382	
2002640	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P348050	
	SOP-PCR-1.4	BacR-qPCR**	1.32E+08	J	TSC/100 mL	P348050	LCS, MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Ref. Method and Comment:
SOP-PCR-1.4: Quality control failure(s) observed. See QA report for details.

Sample Location: Otter Creek @ 68

Collection Date/Time: 06/20/2018 10:30

Field ID: G1SE0003

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002631	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	1119.9	Q	MPN/100 mL	P347382	
2002641	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P348050	
	SOP-PCR-1.4	BacR-qPCR**	9.42E+06		TSC/100 mL	P348050	LCS, MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Sample Location: Taylor Creek @ 441

Collection Date/Time: 06/20/2018 10:45

Field ID: G1SE0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002623	SM 10200 H (mod.)	Chlorophyll-a, Corrected	17		ug/L	P347773	
		Phaeophytin-a	1.7		ug/L	P347773	
		Chlorophyll-a, Uncorrected	18		ug/L	P347773	
2002632	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	8.6	Q	MPN/100 mL	P347382	
2002642	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

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: 06/20/2018 11:20

Field ID: G1SE0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002625	SM 10200 H (mod.)	Chlorophyll-a, Corrected	14		ug/L	P347773	
		Phaeophytin-a	1.8	I	ug/L	P347773	
		Chlorophyll-a, Uncorrected	16		ug/L	P347773	
2002634	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	42.0	Q	MPN/100 mL	P347382	

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: 06/20/2018 11:30

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002624	SM 10200 H (mod.)	Chlorophyll-a, Corrected	40		ug/L	P347773	
		Phaeophytin-a	6.3		ug/L	P347773	

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002624	SM 10200 H (mod.)	Chlorophyll-a, Uncorrected	46		ug/L	P347773	
2002633	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	51.2	Q	MPN/100 mL	P347382	
2002643	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

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: 06/20/2018 12:25

Field ID: G1SE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002635	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	230.8	AQ	MPN/100 mL	P347382	
2002644	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

Sample Location: Mosquito Creek @ 710

Collection Date/Time: 06/20/2018 12:45

Field ID: G1SE0014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002636	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	488.4	Q	MPN/100 mL	P347382	
2002645	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P348050	
	SOP-PCR-1.4	BacR-qPCR**	8.89E+05		TSC/100 mL	P348050	LCS, MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Sample Location: Nubbin Slough Upstream of STA

Collection Date/Time: 06/20/2018 12:55

Field ID: G1SE0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002626	SM 10200 H (mod.)	Chlorophyll-a, Corrected	22		ug/L	P347773	
		Phaeophytin-a	4.3		ug/L	P347773	
		Chlorophyll-a, Uncorrected	25		ug/L	P347773	
2002637	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	25.6	Q	MPN/100 mL	P347382	
2002646	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

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 @ 710

Collection Date/Time: 06/20/2018 13:10

Field ID: G1SE0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002638	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	160.7	Q	MPN/100 mL	P347382	

Sample Location: Lettuce Creek @ 710

Collection Date/Time: 06/20/2018 13:15

Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002639	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	980.4	Q	MPN/100 mL	P347382	

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P347773

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 9223 Quanti-Tray
Batch ID: P347382

Component	Result	Code	Units
Escherichia Coli-Quanti-Tray	1.0	U	MPN/100 mL

Reference Method: SOP-PCR-1.0
Batch ID: P348050

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

Reference Method: SOP-PCR-1.4
Batch ID: P348050

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: P347773

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	114		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P348050

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	106	158	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P348050

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	120	213	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P348050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2001300	HF183-qPCR	84.6		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P348050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2001301	HF183-qPCR	98.9		P	50 - 175
2001768	HF183-qPCR	99.2		P	50 - 175
2002640	HF183-qPCR	64.2		P	50 - 175
2002641	HF183-qPCR	94.2		P	50 - 175
2002645	HF183-qPCR	84.8		P	50 - 175
2005554	HF183-qPCR	106		P	50 - 175
2005555	HF183-qPCR	81.7		P	50 - 175
2005556	HF183-qPCR	99.9		P	50 - 175
2005557	HF183-qPCR	106		P	50 - 175
2005771	HF183-qPCR	100		P	50 - 175
2005772	HF183-qPCR	95.0		P	50 - 175
2005773	HF183-qPCR	68.1	68.9	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P348050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2001300	BacR-qPCR	-91.4		F	50 - 175
2001301	BacR-qPCR	76.3		P	50 - 175
2002640	BacR-qPCR	4.98		F	50 - 175
2002641	BacR-qPCR	78.3		P	50 - 175
2002645	BacR-qPCR	86.8		P	50 - 175
2005554	BacR-qPCR	96.9		P	50 - 175
2005555	BacR-qPCR	64.1		P	50 - 175
2005556	BacR-qPCR	84.8		P	50 - 175
2005557	BacR-qPCR	129		P	50 - 175
2005771	BacR-qPCR	96.5		P	50 - 175
2005772	BacR-qPCR	78.2		P	50 - 175
2005773	BacR-qPCR	69.3	69.5	P/P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P347773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002555	Chlorophyll-a, Corrected	6.87	Sample	P	0 - 25
2002555	Chlorophyll-a, Uncorrected	7.50	Sample	P	0 - 25

Reference Method: SM 9223 Quanti-Tray
Batch ID: P347382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002510	Escherichia Coli-Quanti-Tray	17.0	Sample	P	0 - 80
2002635	Escherichia Coli-Quanti-Tray	38.8	Sample	P	0 - 80
2002779	Escherichia Coli-Quanti-Tray	42.6	Sample	P	0 - 80

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P348050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005773	HF183-qPCR	1.27	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P348050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005773	BacR-qPCR	0.195	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: 2002640
 Field Sample ID: G1SE0007

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	82.0	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	73.4	P	50 - 300

Lab Sample ID: 2002641
 Field Sample ID: G1SE0003

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	116	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	97.3	P	50 - 300

Lab Sample ID: 2002645
 Field Sample ID: G1SE0014

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	103	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	93.9	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	114						6.87	
	Chlorophyll-a, Uncorrected							7.50	
SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray							17.0 38.8 42.6	
SOP-PCR-1.0	HF183-qPCR	158	106	98.9	99.2	64.2			1.27
				94.2					
SOP-PCR-1.4	BacR-qPCR	213	120	76.3	4.98	78.3			0.195
				86.8					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2002623, 2002624, 2002625, 2002626
SM 9223 Quanti-Tray / E31780	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2002630, 2002631, 2002632, 2002633, 2002634, 2002635, 2002636, 2002637, 2002638, 2002639
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2002640, 2002641, 2002645
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2002640, 2002641, 2002645
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2002640, 2002641, 2002642, 2002643, 2002644, 2002645, 2002646

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	06/21/2018	06/21/2018 13:45	Edwin Gonzalez-Soto	06/28/2018 15:20	Carina A. Tull	2002623, 2002624, 2002625, 2002626
SM 9223 Quanti-Tray	06/21/2018	06/21/2018 14:15	Peterson Janvier	06/22/2018 11:50	Peterson Janvier	2002630, 2002631, 2002632, 2002633, 2002634, 2002635, 2002636, 2002637, 2002638, 2002639
SOP-PCR-1.0	06/21/2018	06/21/2018 16:25	Puja Jasrotia	07/13/2018 10:26	Mailin Lopez	2002640, 2002641, 2002645
SOP-PCR-1.4	06/21/2018	06/21/2018 16:25	Puja Jasrotia	07/16/2018 12:13	Sarah Menz	2002640, 2002641, 2002645
SOP-PCR-4.0	06/21/2018	06/21/2018 16:25	Angela Smith	07/09/2018 09:36	Puja Jasrotia	2002640, 2002641, 2002642, 2002643, 2002644, 2002645, 2002646