

Biological Analysis Report

SW-DIST-2018-05-01-01

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

Overflow Analyses Performed By:
Advanced Environmental Laboratories - Tampa
9610 Princess Palm Avenue
Tampa, Florida 33619
DOH Accreditation E84589

Event Description: **English, Turkey, Poley, Mustang**
Request ID: **RQ-2018-04-30-05**
Customer: **SW-DIST**
Project ID: **SMP**

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Date Certified: 28-SEP-2018 12:45



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, 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: Mustang Ranch Crk @ Hopewell

Collection Date/Time: 04/30/2018 11:30

Field ID: G2SW0026

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988862	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.55	U	ug/L	P345155	
		Phaeophytin-a	0.40	U	ug/L	P345155	
		Chlorophyll-a, Uncorrected	0.64	I	ug/L	P345155	

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: Mustang Ranch Crk @ Hopewell

Collection Date/Time: 04/30/2018 11:30

Field ID: G2SW0026

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988864	SOP-PCR-1.0	HF183-qPCR**	190	U	GEU/100 mL	P345373	
	SOP-PCR-1.2	GULL2-qPCR**	1.1E+04	U	TSC/100 mL	P345373	
	SOP-PCR-1.3	GFD-purified-qPCR**	110	U	TSC/100 mL	P346102	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	2.0E+03	U	TSC/100 mL	P345373	LCS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1988872	EPA 1603	Escherichia coli-Membrane Filter**	3500		cfu/100 mL		

Ref. Method and Comment:

SOP-PCR-1.4: Precision data unavailable for Analysis Batch A84199

Sample Location: Mustang Ranch Crk @ CR 39

Collection Date/Time: 04/30/2018 11:05

Field ID: G2SW0050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988865	SOP-PCR-1.0	HF183-qPCR**	2.56E+03		GEU/100 mL	P345373	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1988873	EPA 1603	Escherichia coli-Membrane Filter**	3000		cfu/100 mL		

Sample Location: English Creek above SR 60

Collection Date/Time: 04/30/2018 13:10

Field ID: G2SW0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988866	SOP-PCR-1.0	HF183-qPCR**	100	I	GEU/100 mL	P345373	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1988874	EPA 1603	Escherichia coli-Membrane Filter**	430		cfu/100 mL		

Sample Location: English Creek @ Old Mulberry Rd

Collection Date/Time: 04/30/2018 13:45

Field ID: G2SW0048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988867	SOP-PCR-1.0	HF183-qPCR**	150	I	GEU/100 mL	P345373	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1988875	EPA 1603	Escherichia coli-Membrane Filter**	570		cfu/100 mL		

Sample Location: Turkey Creek @ SR60

Collection Date/Time: 04/30/2018 09:00

Field ID: G2SW0051

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988863	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.65	I	ug/L	P345155	
		Phaeophytin-a	0.40	U	ug/L	P345155	
		Chlorophyll-a, Uncorrected	0.78	I	ug/L	P345155	

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: Turkey Creek @ SR60

Collection Date/Time: 04/30/2018 09:00

Field ID: G2SW0051

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988868	SOP-PCR-1.0	HF183-qPCR**	1.13E+03	A	GEU/100 mL	P345373	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1988876	EPA 1603	Escherichia coli-Membrane Filter**	1700	B	cfu/100 mL		

Sample Location: Turkey Creek @ Sydney Rd

Collection Date/Time: 04/30/2018 10:30

Field ID: G2SW0025

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988869	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1988877	EPA 1603	Escherichia coli-Membrane Filter**	168		cfu/100 mL		

Sample Location: Poley Creek @ SR 60

Collection Date/Time: 04/30/2018 14:20

Field ID: G2SW0049

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988870	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P345373	
	SOP-PCR-1.2	GULL2-qPCR**	5.6E+03	U	TSC/100 mL	P345373	
	SOP-PCR-1.3	GFD-purified-qPCR**	110	U	TSC/100 mL	P346102	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P345373	LCS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1988878	EPA 1603	Escherichia coli-Membrane Filter**	1700	B	cfu/100 mL		

Ref. Method and Comment:

SOP-PCR-1.4: Precision data unavailable for Analysis Batch A84199

Sample Location: Poley Creek @ Shepard Rd

Collection Date/Time: 04/30/2018 14:00

Field ID: G2SW0014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1988871	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1988879	EPA 1603	Escherichia coli-Membrane Filter**	310		cfu/100 mL		

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P345155

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P345155

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: P345373

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

Reference Method: SOP-PCR-1.2
Batch ID: P345373

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

Reference Method: SOP-PCR-1.3
Batch ID: P346102

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

Reference Method: SOP-PCR-1.4
Batch ID: P345373

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: P345155

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	96.5		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P345373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	100	161	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P345373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	138	108	P/P	50 - 300

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.3
 Batch ID: P346102

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	131	37.2	P/F	50 - 175

Reference Method: SOP-PCR-1.4
 Batch ID: P345373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	107	251	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
 Batch ID: P345373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985267	HF183-qPCR	95.9		P	50 - 175
1988864	HF183-qPCR	79.7		P	50 - 175
1988865	HF183-qPCR	93.2		P	50 - 175
1988866	HF183-qPCR	93.8		P	50 - 175
1988867	HF183-qPCR	89.5		P	50 - 175
1988868	HF183-qPCR	90.3	96.9	P/P	50 - 175
1988870	HF183-qPCR	92.4		P	50 - 175
1988958	HF183-qPCR	87.3		P	50 - 175
1988959	HF183-qPCR	85.9		P	50 - 175
1988978	HF183-qPCR	96.2		P	50 - 175

Reference Method: SOP-PCR-1.2
 Batch ID: P345373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985267	GULL2-qPCR	154		P	50 - 300
1988864	GULL2-qPCR	103		P	50 - 300
1988870	GULL2-qPCR	107		P	50 - 300
1988959	GULL2-qPCR	107		P	50 - 300

Reference Method: SOP-PCR-1.3
 Batch ID: P346102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985267	GFD-purified-qPCR	0.0		F	50 - 175
1987901	GFD-purified-qPCR	160	141	P/P	50 - 175
1987903	GFD-purified-qPCR	160		P	50 - 175
1987904	GFD-purified-qPCR	152		P	50 - 175
1988864	GFD-purified-qPCR	131		P	50 - 175
1988870	GFD-purified-qPCR	73.0		P	50 - 175
1988959	GFD-purified-qPCR	115		P	50 - 175

Reference Method: SOP-PCR-1.4
 Batch ID: P345373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P345373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985267	BacR-qPCR	81.8		P	50 - 175
1988864	BacR-qPCR	60.1		P	50 - 175
1988870	BacR-qPCR	82.2		P	50 - 175
1988958	BacR-qPCR	79.6		P	50 - 175
1988959	BacR-qPCR	79.1		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P345373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1988868	HF183-qPCR	7.06	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P345373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1987901	GULL2-qPCR	1.94	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P346102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1987901	GFD-purified-qPCR	12.6	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: 1988864
Field Sample ID: G2SW0026

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	114	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	119	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	100	P	50 - 300

Lab Sample ID: 1988865
Field Sample ID: G2SW0050

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	119	P	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 1988866
Field Sample ID: G2SW0006

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	112	P	50 - 300

Lab Sample ID: 1988867
Field Sample ID: G2SW0048

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	113	P	50 - 300

Lab Sample ID: 1988868
Field Sample ID: G2SW0051

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	111	P	50 - 300

Lab Sample ID: 1988870
Field Sample ID: G2SW0049

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	105	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	111	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	106	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
SM 10200 H (mod.) SOP-PCR-1.0	Chlorophyll-a, Corrected HF183-qPCR	96.5 161 100	95.9 79.7 93.2			7.06
SOP-PCR-1.2	GULL2-qPCR	108 138	154 103 107			1.94
SOP-PCR-1.3	GFD-purified-qPCR	37.2 131	0.0 160 141			12.6
SOP-PCR-1.4	BacR-qPCR	251 107	81.8 60.1 82.2 79.6			

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 1603 / E84589	Escherichia coli by membrane filter method using modified mTEC by Advanced Environmental Tampa Lab for SWD	1988872, 1988873, 1988874, 1988875, 1988876, 1988877, 1988878, 1988879
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	1988862, 1988863
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1988864, 1988865, 1988866, 1988867, 1988868, 1988870
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	1988864, 1988870
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	1988864, 1988870
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	1988864, 1988870

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	1988864, 1988865, 1988866, 1988867, 1988868, 1988869, 1988870, 1988871

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 1603	04/30/2018	04/30/2018 16:50		05/01/2018 14:30	AEL - Tampa	1988872, 1988873, 1988874, 1988875, 1988876, 1988877, 1988878, 1988879
SM 10200 H (mod.)	05/01/2018	05/01/2018 14:13	Mariam Hanna	05/07/2018 08:30	Carina A. Tull	1988862, 1988863
SOP-PCR-1.0	05/01/2018	05/01/2018 13:05	Sarah Menz	05/23/2018 12:01	Mailin Lopez	1988864, 1988865, 1988866, 1988867, 1988868, 1988870
SOP-PCR-1.2	05/01/2018	05/01/2018 13:05	Sarah Menz	05/29/2018 16:30	Mailin Lopez	1988864, 1988870
SOP-PCR-1.3	05/01/2018	05/01/2018 13:05	Mailin Lopez	05/31/2018 09:23	Sarah Menz	1988864, 1988870
SOP-PCR-1.4	05/01/2018	05/01/2018 13:05	Sarah Menz	05/25/2018 10:17	Mailin Lopez	1988864, 1988870
SOP-PCR-4.0	05/01/2018	05/01/2018 13:05	Angela Smith	05/22/2018 13:40	Puja Jasrotia	1988864, 1988865, 1988866, 1988867, 1988868, 1988869, 1988870, 1988871