

Biological Analysis Report

SW-DIST-2018-11-02-01

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: **Rattlesnake, Braden, Cedar**
Request ID: **RQ-2018-11-26-11**
Customer: **SW-DIST**
Project ID: **SMP**

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Date Certified: 12-DEC-2018 16:19



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: 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: Braden R @ Linker Lodge

Collection Date/Time: 11/01/2018 10:30

Field ID: G2SW0016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2038759	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
2038765	EPA 1603	Escherichia coli-Membrane Filter**	12	B	cfu/100 mL		

Sample Location: Braden River @ Cypress Bend Park

Collection Date/Time: 11/01/2018 10:45

Field ID: G2SW0044

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2038760	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
2038766	EPA 1603	Escherichia coli-Membrane Filter**	8	B	cfu/100 mL		

Sample Location: Rattlesnake Slough @ Linden

Collection Date/Time: 11/01/2018 12:20

Field ID: G2SW0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2038761	SOP-PCR-1.0	HF183-qPCR**	310	I	GEU/100 mL	P355487	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
2038767	EPA 1603	Escherichia coli-Membrane Filter**	1700	B	cfu/100 mL		

Sample Location: Cedar Creek @ Saddlehorn

Collection Date/Time: 11/01/2018 11:50

Field ID: G2SW0018

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2038762	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P355487	
	SOP-PCR-1.2	GULL2-qPCR**	1.7E+04	U	TSC/100 mL	P355487	
	SOP-PCR-1.3	GFD-purified-qPCR**	170	UJ	TSC/100 mL	P355804	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P355487	LCS, MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
2038768	EPA 1603	Escherichia coli-Membrane Filter**	490		cfu/100 mL		

Ref. Method and Comment:
SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Sample Location: Cedar Creek near end of WBID

Collection Date/Time: 11/01/2018 11:20

Field ID: G2SW0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2038763	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
2038769	EPA 1603	Escherichia coli-Membrane Filter**	44	B	cfu/100 mL		

Sample Location: Rattlesnake Slough @ Lockwood Ridge Rd

Collection Date/Time: 11/01/2018 12:05

Field ID: G2SW0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2038764	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
2038770	EPA 1603	Escherichia coli-Membrane Filter**	56	B	cfu/100 mL		

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
Batch ID: P355487

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

Reference Method: SOP-PCR-1.2
Batch ID: P355487

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

Reference Method: SOP-PCR-1.3
Batch ID: P355804

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

Reference Method: SOP-PCR-1.4
Batch ID: P355487

Component	Result	Code	Units
BacR-qPCR	3.0E+03	U	TSC/100 mL

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P355487

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	121	135	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P355487

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	139	126	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P355804

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	150	21.5	P/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P355487

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	82.5	182	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P355487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038761	HF183-qPCR	89.4	107	P	50 - 175
2038762	HF183-qPCR	104		P/P	50 - 175
2040322	HF183-qPCR	102	107	P	50 - 175
2040324	HF183-qPCR	93.8		P	50 - 175
2040451	HF183-qPCR	106	107	P	50 - 175
2041068	HF183-qPCR	99.9		P	50 - 175
2041138	HF183-qPCR	120	107	P	50 - 175
2041703	HF183-qPCR	113		P	50 - 175
2041704	HF183-qPCR	108	107	P	50 - 175
2041706	HF183-qPCR	105		P	50 - 175
2042736	HF183-qPCR	105	107	P	50 - 175
2043410	HF183-qPCR	95.0		P	50 - 175
2043414	HF183-qPCR	105		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P355487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038762	GULL2-qPCR	134	144	P/P	50 - 300
2040324	GULL2-qPCR	128		P	50 - 300
2040451	GULL2-qPCR	118	144	P	50 - 300
2041703	GULL2-qPCR	136		P	50 - 300
2041706	GULL2-qPCR	123	144	P	50 - 300
2042736	GULL2-qPCR	120		P	50 - 300
2043410	GULL2-qPCR	101	144	P	50 - 300
2043414	GULL2-qPCR	118		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P355804

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038762	GFD-purified-qPCR	170	205	P/F	50 - 175
2039236	GFD-purified-qPCR	190		F	50 - 175
2040451	GFD-purified-qPCR	169	205	P	50 - 175
2041703	GFD-purified-qPCR	189		F	50 - 175
2041706	GFD-purified-qPCR	202	205	F	50 - 175
2042736	GFD-purified-qPCR	163		P	50 - 175
2043410	GFD-purified-qPCR	142	205	P	50 - 175
2043414	GFD-purified-qPCR	176		F	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P355487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038762	BacR-qPCR	66.0	66.4	P/P	50 - 175
2040324	BacR-qPCR	52.8		P	50 - 175
2040451	BacR-qPCR	54.0	66.4	P	50 - 175
2041068	BacR-qPCR	52.1		P	50 - 175
2041703	BacR-qPCR	60.5	66.4	P	50 - 175
2041706	BacR-qPCR	52.9		P	50 - 175
2042736	BacR-qPCR	56.1	66.4	P	50 - 175
2043410	BacR-qPCR	48.7		F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P355487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043414	BacR-qPCR	54.3		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P355487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038762	HF183-qPCR	2.28	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P355487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038762	GULL2-qPCR	7.45	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P355804

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038762	GFD-purified-qPCR	18.8	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P355487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038762	BacR-qPCR	0.687	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: 2038761
Field Sample ID: G2SW0017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	88.9	P	50 - 300

Lab Sample ID: 2038762
Field Sample ID: G2SW0018

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	150	P	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 2038762
 Field Sample ID: G2SW0018

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.4	SKETA-qPCR	122	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	135 121	89.4 104 107 102			2.28
SOP-PCR-1.2	GULL2-qPCR	126 139	134 144 128 118			7.45
SOP-PCR-1.3	GFD-purified-qPCR	21.5 150	170 205 190 169			18.8
SOP-PCR-1.4	BacR-qPCR	182 82.5	66.0 66.4 52.8 54.0			0.687

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 1603 / E84589	Escherichia coli by membrane filter Advanced Environmental Laboratory in Tampa	2038765, 2038766, 2038767, 2038768, 2038769, 2038770
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2038761, 2038762
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2038762
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2038762
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2038762
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2038759, 2038760, 2038761, 2038762, 2038763, 2038764

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 1603	11/01/2018	11/01/2018 16:05		11/02/2018 14:30	AEL - Tampa	2038765, 2038766, 2038767, 2038768, 2038769, 2038770
SOP-PCR-1.0	11/02/2018	11/02/2018 12:25	Sarah Menz	12/06/2018 09:05	Mailin Lopez	2038761, 2038762
SOP-PCR-1.2	11/02/2018	11/02/2018 12:25	Sarah Menz	12/07/2018 09:10	Mailin Lopez	2038762
SOP-PCR-1.3	11/02/2018	11/02/2018 12:25	Mailin Lopez	12/11/2018 10:27	Sarah Menz	2038762
SOP-PCR-1.4	11/02/2018	11/02/2018 12:25	Sarah Menz	12/06/2018 14:02	Mailin Lopez	2038762
SOP-PCR-4.0	11/02/2018	11/02/2018 12:25	Angela Smith	12/03/2018 15:06	Sarah Menz	2038759, 2038760, 2038761, 2038762, 2038763, 2038764