

Biological Analysis Report

SW-DIST-2019-04-18-01

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

Overflow Analyses Performed By:
Benchmark Environmental, Inc.
1711 12th Street East
Palmetto, FL 34221
DOH Accreditation E84167

Event Description: **SMP - Run 2**
Request ID: **RQ-2019-04-08-13**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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13051 N. Telecom Parkway
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Certified by: Jacqueline Savage, Environmental Administrator

Date Certified: 22-MAY-2019 13:35

A handwritten signature in black ink that reads "Jackie Savage". The signature is written in a cursive, flowing style.

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: SPARTMAN BRANCH AT HARVEY TEW RD

Collection Date/Time: 04/17/2019 11:30

Field ID: G2SW0067

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079340	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P362090	LCS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P362090	
2079346	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	480		MPN/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.4: Precision data unavailable for Analysis Batch A91055

Sample Location: POLEY CREEK @ SR 60

Collection Date/Time: 04/17/2019 12:45

Field ID: G2SW0049

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079341	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P362090	LCS
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	I	TSC/100 mL	P362090	
2079347	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	1850		MPN/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.4: Precision data unavailable for Analysis Batch A91055

Sample Location: MUSTANG RANCH CREEK @ HOPEWELL

Collection Date/Time: 04/17/2019 11:00

Field ID: G2SW0026

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079342	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P362090	LCS
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P362090	
2079348	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	1553		MPN/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.4: Precision data unavailable for Analysis Batch A91055

Sample Location: BAKER CREEK EAST @ PEMBERTON DR

Collection Date/Time: 04/17/2019 12:05

Field ID: G2SW0080

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079338	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold			P362063	
2079344	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	355		MPN/100 mL		

Sample Location: BAKER CREEK EAST @ McINTOSH RD

Collection Date/Time: 04/17/2019 11:55

Field ID: G2SW0081

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2079339	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P363172	
	SOP-PCR-1.4	BacR-qPCR**	6.32E+05		TSC/100 mL	P363172	MS
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P362063	
2079345	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	743		MPN/100 mL		

Quality Assurance Report

Method Blank Results

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
Batch ID: P362090

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

Reference Method: SOP-PCR-1.0
Batch ID: P363172

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

Reference Method: SOP-PCR-1.4
Batch ID: P362090

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

Reference Method: SOP-PCR-1.4
Batch ID: P363172

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: P362090

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	117	197	P/F	50 - 175

Reference Method: SOP-PCR-1.0
Batch ID: P363172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	130	123	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P362090

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	85.3	95.1	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P363172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	104	84.2	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P362090

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2074723	HF183-qPCR	92.9	103	P	50 - 175
2074724	HF183-qPCR	110		P	50 - 175
2078276	HF183-qPCR	84.2		P	50 - 175
2078277	HF183-qPCR	103		P/P	50 - 175
2078278	HF183-qPCR	88.2		P	50 - 175
2078279	HF183-qPCR	99.9		P	50 - 175
2078280	HF183-qPCR	101		P	50 - 175
2078707	HF183-qPCR	107		P	50 - 175
2079340	HF183-qPCR	100		P	50 - 175
2079341	HF183-qPCR	94.1		P	50 - 175
2079342	HF183-qPCR	103		P	50 - 175
2079788	HF183-qPCR	99.6		P	50 - 175
2079795	HF183-qPCR	98.1		P	50 - 175

Reference Method: SOP-PCR-1.0

Batch ID: P363172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076372	HF183-qPCR	103	62.6	P	50 - 175
2078230	HF183-qPCR	95.8		P	50 - 175
2078231	HF183-qPCR	97.9		P	50 - 175
2079339	HF183-qPCR	100		P	50 - 175
2082371	HF183-qPCR	91.4		P	50 - 175
2082372	HF183-qPCR	90.3		P	50 - 175
2082373	HF183-qPCR	75.0		P	50 - 175
2082374	HF183-qPCR	69.4		P/P	50 - 175
2083121	HF183-qPCR	86.8		P	50 - 175
2083122	HF183-qPCR	108		P	50 - 175
2083298	HF183-qPCR	95.4		P	50 - 175
2084684	HF183-qPCR	114		P	50 - 175
2084685	HF183-qPCR	87.0		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P362090

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2074723	BacR-qPCR	56.2		P	50 - 175
2074724	BacR-qPCR	61.4		P	50 - 175
2078707	BacR-qPCR	73.8		P	50 - 175
2079340	BacR-qPCR	76.6		P	50 - 175
2079341	BacR-qPCR	73.4		P	50 - 175
2079342	BacR-qPCR	83.5		P	50 - 175
2079788	BacR-qPCR	78.6		P	50 - 175
2079795	BacR-qPCR	77.1		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P363172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076372	BacR-qPCR	75.8		P	50 - 175
2078231	BacR-qPCR	85.8		P	50 - 175
2079339	BacR-qPCR	78.6		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P363172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2082371	BacR-qPCR	69.5		P	50 - 175
2082372	BacR-qPCR	69.6		P	50 - 175
2082373	BacR-qPCR	54.5		P	50 - 175
2082374	BacR-qPCR	48.0	38.9	F/F	50 - 175
2083121	BacR-qPCR	79.7		P	50 - 175
2083122	BacR-qPCR	107		P	50 - 175
2083298	BacR-qPCR	78.6		P	50 - 175
2084684	BacR-qPCR	83.6		P	50 - 175
2084685	BacR-qPCR	74.1		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P362090

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2078277	HF183-qPCR	0.0378	Spike	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P363172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2082374	HF183-qPCR	10.4	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P363172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2082374	BacR-qPCR	22.0	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: 2079339
Field Sample ID: G2SW0081

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	110	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	105	P	50 - 300

Lab Sample ID: 2079340
Field Sample ID: G2SW0067

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
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Quality Assurance Report Surrogates

Lab Sample ID: 2079340
Field Sample ID: G2SW0067

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	105	P	50 - 300

Lab Sample ID: 2079341
Field Sample ID: G2SW0049

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

Lab Sample ID: 2079342
Field Sample ID: G2SW0026

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

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	197	117	92.9	110	84.2			0.0378
	HF183-qPCR	123	130	75.0	69.4	62.6			10.4
SOP-PCR-1.4	BacR-qPCR	95.1	85.3	56.2	61.4	73.8			
	BacR-qPCR	84.2	104	54.5	48.0	38.9			22.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 9223 B Quanti-Tray / E84167	Escherichia coli by Colilert Quanti-Tray method by Benchmark EnviroAnalytical in Palmetto	2079344, 2079345, 2079346, 2079347, 2079348
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2079339, 2079340, 2079341, 2079342
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2079339, 2079340, 2079341, 2079342
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2079338, 2079339

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 9223 B Quanti-Tray	04/17/2019	04/17/2019 15:44		04/18/2019 16:09	Benchmark EnviroAnalytical - Palmetto	2079344, 2079345, 2079346, 2079347, 2079348
SOP-PCR-1.0	04/18/2019	04/18/2019 14:00	Angela Smith	05/13/2019 10:08	Sarah Menz	2079339
	04/18/2019	04/18/2019 14:00	Sarah Menz	04/26/2019 13:12	Mailin Lopez	2079340, 2079341, 2079342
SOP-PCR-1.4	04/18/2019	04/18/2019 14:00	Angela Smith	05/13/2019 15:40	Sarah Menz	2079339
	04/18/2019	04/18/2019 14:00	Sarah Menz	04/29/2019 10:24	Mailin Lopez	2079340, 2079341, 2079342
SOP-PCR-4.0	04/18/2019	04/18/2019 14:00	Angela Smith	05/06/2019 09:16	Sarah Menz	2079338, 2079339