

Chemical Analysis Report

SO-DIST-2018-02-23-03

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

Event Description: **Collier County Markers & Tracers (GORDONRIV)**
Request ID: **RQ-2018-02-19-42**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Maryann Dugan

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 13-MAR-2018 14:13

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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 group are included in this report: Pesticides.

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: GORDONRIV

Collection Date/Time: 02/22/2018 11:19

Field ID: AF46895

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1970102	EPA 8321B	2,4-D	0.049		ug/L	P340489	
		Sucralose**	1.8		ug/L	P340408	
		Bentazon	0.17		ug/L	P340489	MS
		MCP	0.0020	U	ug/L	P340489	MS
		Triclopyr**	0.0040	U	ug/L	P340489	
		Imidacloprid	0.0091		ug/L	P340489	MS
		Diuron	0.0020	U	ug/L	P340489	
		Primidone**	0.014	I	ug/L	P340489	
		Linuron	0.0040	U	ug/L	P340489	
		Acetaminophen**	0.0080	U	ug/L	P340489	
		Fenuron	0.0080	U	ug/L	P340489	
		Imazapyr**	0.049		ug/L	P340489	
		Carbamazepine**	0.0014	I	ug/L	P340489	
		Fluridone**	0.034		ug/L	P340489	

Quality Assurance Report Method Blank Results

Reference Method: EPA 8321B

Batch ID: P340408

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: EPA 8321B

Batch ID: P340489

Component	Result	Code	Units
2,4-D	0.0020	U	ug/L
Acetaminophen	0.0080	U	ug/L
Bentazon	8.0E-04	U	ug/L
Carbamazepine	4.0E-04	U	ug/L
Diuron	0.0020	U	ug/L
Fenuron	0.0080	U	ug/L
Fluridone	8.0E-04	U	ug/L
Imazapyr	0.0040	U	ug/L
Imidacloprid	0.0020	U	ug/L
Linuron	0.0040	U	ug/L
MCP	0.0020	U	ug/L
Primidone	0.0040	U	ug/L
Triclopyr	0.0040	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B

Batch ID: P340408

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	113		P	40 - 150

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P340489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	66.1		P	40 - 150
Acetaminophen	94.3		P	30 - 150
Bentazon	68.2		P	30 - 150
Carbamazepine	79.2		P	40 - 150
Diuron	63.5		P	40 - 150
Fenuron	97.2		P	40 - 150
Fluridone	79.1		P	40 - 150
Imazapyr	72.2		P	40 - 150
Imidacloprid	88.2		P	40 - 160
Linuron	73.0		P	40 - 150
MCP	66.7		P	40 - 150
Primidone	94.3		P	40 - 150
Triclopyr	65.3		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P340408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1969523	Sucralose	122	127	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P340489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1969855	2,4-D	52.7	53.4	P/P	40 - 150
1969855	Acetaminophen	130	147	P/P	30 - 150
1969855	Bentazon	22.0	21.7	F/F	30 - 150
1969855	Carbamazepine	71.6	85.5	P/P	40 - 150
1969855	Diuron	66.2	65.8	P/P	40 - 150
1969855	Fenuron	86.4	80.3	P/P	40 - 150
1969855	Fluridone	73.7	68.8	P/P	40 - 150
1969855	Imazapyr	61.0	60.6	P/P	40 - 150
1969855	Imidacloprid	203	208	F/F	40 - 160
1969855	Linuron	75.1	82.8	P/P	40 - 150
1969855	MCP	37.5	36.4	F/F	40 - 150
1969855	Primidone	103	101	P/P	40 - 150
1969855	Triclopyr	45.8	47.4	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P340408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1969523	Sucralose	3.42	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P340489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1969855	2,4-D	1.27	Spike	P	0 - 30
1969855	Acetaminophen	12.1	Spike	P	0 - 30
1969855	Bentazon	1.40	Spike	P	0 - 30
1969855	Carbamazepine	17.7	Spike	P	0 - 30
1969855	Diuron	0.546	Spike	P	0 - 30
1969855	Fenuron	7.22	Spike	P	0 - 30
1969855	Fluridone	6.84	Spike	P	0 - 30
1969855	Imazapyr	0.625	Spike	P	0 - 30
1969855	Imidacloprid	2.45	Spike	P	0 - 30
1969855	Linuron	9.77	Spike	P	0 - 30
1969855	MCP	2.95	Spike	P	0 - 30
1969855	Primidone	2.38	Spike	P	0 - 30
1969855	Triclopyr	3.30	Spike	P	0 - 30

* 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: 1970102
Field Sample ID: AF46895

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	56.9	P	30 - 160
EPA 8321B	Acetaminophen-d4	139	P	30 - 160
EPA 8321B	Carbamazepine-d10	82.5	P	30 - 160
EPA 8321B	Diuron-d6	64.5	P	30 - 160
EPA 8321B	Primidone-d5	92.2	P	30 - 160
EPA 8321B	Sucralose-d6	132	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A82414
Included Lab Sample IDs: 1970102

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	109	107	P/P	60 - 150

Reference Method: EPA 8321B
Run ID: A82436
Included Lab Sample IDs: 1970102

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	93.7	96.4	P/P	50 - 150
Acetaminophen	99.9	100	P/P	60 - 150
Carbamazepine	102	86.7	P/P	60 - 150
Diuron	113	110	P/P	60 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A82436
Included Lab Sample IDs: 1970102

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fenuron	105	106	P/P	60 - 150
Fluridone	120	116	P/P	60 - 160
Imazapyr	107	94.9	P/P	50 - 150
Imidacloprid	105	95.6	P/P	60 - 150
Linuron	113	108	P/P	60 - 150
MCP	98.0	92.5	P/P	50 - 150
Primidone	103	101	P/P	60 - 150
Triclopyr	105	88.8	P/P	50 - 150

Reference Method: EPA 8321B
Run ID: A82534
Included Lab Sample IDs: 1970102

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bentazon	97.8	94.4	P/P	50 - 150

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 8321B	2,4-D	66.1	52.7 53.4			1.27
	Acetaminophen	94.3	130 147			12.1
	Bentazon	68.2	22.0 21.7			1.40
	Carbamazepine	79.2	85.5 71.6			17.7
	Diuron	63.5	65.8 66.2			0.546
	Fenuron	97.2	80.3 86.4			7.22
	Fluridone	79.1	68.8 73.7			6.84
	Imazapyr	72.2	60.6 61.0			0.625
	Imidacloprid	88.2	208 203			2.45
	Linuron	73.0	82.8 75.1			9.77
	MCP	66.7	37.5 36.4			2.95
	Primidone	94.3	101 103			2.38
	Sucralose	113	122 127			3.42
	Triclopyr	65.3	45.8 47.4			3.30

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	1970102
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1970102

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	02/23/2018	03/01/2018	Hoor Shaik	03/02/2018	Julie Michelle Frank	1970102
	02/23/2018	03/01/2018	Hoor Shaik	03/05/2018	Julie Michelle Frank	1970102
	02/23/2018	03/02/2018	Julie Michelle Frank	03/03/2018	Juyoung Kim	1970102