

Chemical Analysis Report

SO-DIST-2018-04-18-01

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-2018-02-19-41**

Customer: **SO-DIST**

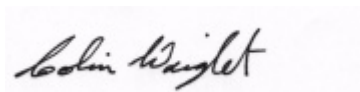
Project ID: **SMP**

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

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 10-MAY-2018 12:31

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored rectangular 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: Gordon Riv

Collection Date/Time: 04/17/2018 11:33

Field ID: AF47674

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1985268	EPA 8321B	2,4-D	0.011		ug/L	P343642	
		Bentazon	0.35		ug/L	P343642	
		MCP	0.0020	U	ug/L	P343642	
		Triclopyr**	0.0040	U	ug/L	P343642	
		Imidacloprid	0.016		ug/L	P343642	
		Diuron	0.0020	U	ug/L	P343642	
		Pyraclostrobin**	0.0020	U	ug/L	P343642	
		Primidone**	0.020		ug/L	P343642	
		Linuron	0.0040	U	ug/L	P343642	
		Acetaminophen**	0.0080	U	ug/L	P343642	
		Fenuron	0.016	U	ug/L	P343642	
		Imazapyr**	0.043		ug/L	P343642	
		Carbamazepine**	0.0019		ug/L	P343642	
		Fluridone**	0.029		ug/L	P343642	
		Hydrocodone**	8.0E-04	U	ug/L	P343642	
		Sucralose**	0.92		ug/L	P343548	
		Glyphosate**	0.47	J	ug/L	P343548	SUR
		AMPA**	0.16	IJ	ug/L	P343548	SUR
		Endothall**	0.10	U	ug/L	P343548	
		Glufosinate**	0.10	UJ	ug/L	P343548	SUR

Ref. Method and Comment:

EPA 8321B: Refer to the narrative for an explanation of QC Codes. Results confirmed in re-extraction.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B

Batch ID: P343548

Component	Result	Code	Units
AMPA	0.10	U	ug/L
Endothall	0.10	U	ug/L
Glufosinate	0.10	U	ug/L
Glyphosate	0.10	U	ug/L
Sucralose	0.10	U	ug/L

Reference Method: EPA 8321B

Batch ID: P343642

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	0.016	U	ug/L
Fluridone	8.0E-04	U	ug/L
Hydrocodone	8.0E-04	U	ug/L
Imazapyr	0.0040	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 8321B
Batch ID: P343642

Component	Result	Code	Units
Imidacloprid	0.0020	U	ug/L
Linuron	0.0040	U	ug/L
MCP	0.0020	U	ug/L
Primidone	0.0040	U	ug/L
Pyraclostrobin	0.0020	U	ug/L
Triclopyr	0.0040	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P343548

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
AMPA	85.4		P	40 - 140
Endothall	87.0		P	40 - 140
Glufosinate	75.6		P	40 - 140
Glyphosate	87.3		P	40 - 140
Sucralose	118		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P343642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	111		P	40 - 150
Acetaminophen	122		P	30 - 150
Bentazon	134		P	30 - 150
Carbamazepine	116		P	40 - 150
Diuron	80.7		P	40 - 150
Fenuron	134		P	40 - 150
Fluridone	58.8		P	40 - 150
Hydrocodone	115		P	40 - 150
Imazapyr	107		P	40 - 150
Imidacloprid	129		P	40 - 160
Linuron	81.4		P	40 - 150
MCP	105		P	40 - 150
Primidone	139		P	40 - 150
Pyraclostrobin	59.7		P	40 - 150
Triclopyr	105		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P343548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984992	AMPA	81.3	68.5	P/P	40 - 140
1984992	Endothall	117	113	P/P	40 - 140
1984992	Glufosinate	85.8	84.9	P/P	40 - 140
1984992	Glyphosate	71.1	72.4	P/P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P343548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984992	Sucralose	51.9	48.9	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P343642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985615	2,4-D	68.9	71.4	P/P	40 - 150
1985615	Acetaminophen	116	120	P/P	30 - 150
1985615	Bentazon	70.5	89.7	P/P	30 - 150
1985615	Carbamazepine	106	110	P/P	40 - 150
1985615	Diuron	73.3	71.4	P/P	40 - 150
1985615	Fenuron	116	125	P/P	40 - 150
1985615	Fluridone	47.0	47.4	P/P	40 - 150
1985615	Hydrocodone	118	115	P/P	40 - 150
1985615	Imazapyr	78.0	82.2	P/P	40 - 150
1985615	Imidacloprid	128	136	P/P	40 - 160
1985615	Linuron	67.8	71.1	P/P	40 - 150
1985615	MCCP	74.6	66.9	P/P	40 - 150
1985615	Primidone	112	122	P/P	40 - 150
1985615	Pyraclostrobin	60.3	53.3	P/P	40 - 150
1985615	Triclopyr	70.9	70.3	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P343548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984992	AMPA	17.0	Spike	P	0 - 30
1984992	Endothall	2.80	Spike	P	0 - 30
1984992	Glufosinate	1.08	Spike	P	0 - 30
1984992	Glyphosate	1.79	Spike	P	0 - 30
1984992	Sucralose	5.19	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P343642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985615	2,4-D	3.61	Spike	P	0 - 30
1985615	Acetaminophen	3.23	Spike	P	0 - 30
1985615	Bentazon	24.0	Spike	P	0 - 30
1985615	Carbamazepine	3.79	Spike	P	0 - 30
1985615	Diuron	2.69	Spike	P	0 - 30
1985615	Fenuron	7.51	Spike	P	0 - 30
1985615	Fluridone	0.994	Spike	P	0 - 30
1985615	Hydrocodone	2.47	Spike	P	0 - 30
1985615	Imazapyr	5.21	Spike	P	0 - 30
1985615	Imidacloprid	5.51	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P343642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985615	Linuron	4.75	Spike	P	0 - 30
1985615	MCP	10.8	Spike	P	0 - 30
1985615	Primidone	9.12	Spike	P	0 - 30
1985615	Pyraclostrobin	12.3	Spike	P	0 - 30
1985615	Triclopyr	0.844	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: 1985268
Field Sample ID: AF47674

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	2,4-D-d3	92.7	P	30 - 160
EPA 8321B	2,4-D-d3	92.7	P	30 - 160
EPA 8321B	Acetaminophen-d4	121	P	30 - 160
EPA 8321B	Acetaminophen-d4	121	P	30 - 160
EPA 8321B	Carbamazepine-d10	109	P	30 - 160
EPA 8321B	Carbamazepine-d10	109	P	30 - 160
EPA 8321B	Diuron-d6	68.5	P	30 - 160
EPA 8321B	Diuron-d6	68.5	P	30 - 160
EPA 8321B	Endothall-d6	84.0	P	40 - 160
EPA 8321B	Endothall-d6	84.0	P	40 - 160
EPA 8321B	Glyphosate 13C 15N	11.9	F	40 - 160
EPA 8321B	Glyphosate 13C 15N	11.9	F	40 - 160
EPA 8321B	Primidone-d5	122	P	30 - 160
EPA 8321B	Primidone-d5	122	P	30 - 160
EPA 8321B	Sucralose-d6	68.7	P	40 - 160
EPA 8321B	Sucralose-d6	68.7	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A83333
Included Lab Sample IDs: 1985268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
AMPA	70.9	78.7	P/P	60 - 150
Endothall	79.7	87.8	P/P	60 - 150
Glufosinate	69.2	70.5	P/P	60 - 150
Glyphosate	84.9	89.6	P/P	60 - 150
Sucralose	96.2	94.5	P/P	60 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A83600
Included Lab Sample IDs: 1985268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	123	119	P/P	50 - 150
Acetaminophen	124	137	P/P	60 - 150
Carbamazepine	136	127	P/P	60 - 150
Diuron	133	127	P/P	60 - 150
Fenuron	131	126	P/P	60 - 150
Fluridone	111	112	P/P	60 - 160
Hydrocodone	118	120	P/P	60 - 150
Imazapyr	96.8	109	P/P	50 - 150
Imidacloprid	126	122	P/P	60 - 150
Linuron	125	129	P/P	60 - 150
MCPP	128	124	P/P	50 - 150
Primidone	110	135	P/P	60 - 150
Pyraclostrobin	95.1	106	P/P	60 - 150
Triclopyr	131	127	P/P	50 - 150

Reference Method: EPA 8321B
Run ID: A83753
Included Lab Sample IDs: 1985268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bentazon	134	136	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		Precision SMP	MS
			LCS			
EPA 8321B	2,4-D	111	68.9	71.4		3.61
	Acetaminophen	122	116	120		3.23
	AMPA	85.4	81.3	68.5		17.0
	Bentazon	134	70.5	89.7		24.0
	Carbamazepine	116	106	110		3.79
	Diuron	80.7	73.3	71.4		2.69
	Endothall	87.0	117	113		2.80
	Fenuron	134	116	125		7.51
	Fluridone	58.8	47.0	47.4		0.994
	Glufosinate	75.6	85.8	84.9		1.08
	Glyphosate	87.3	71.1	72.4		1.79
	Hydrocodone	115	118	115		2.47
	Imazapyr	107	78.0	82.2		5.21
	Imidacloprid	129	128	136		5.51
	Linuron	81.4	67.8	71.1		4.75
	MCPP	105	74.6	66.9		10.8
	Primidone	139	112	122		9.12
	Pyraclostrobin	59.7	60.3	53.3		12.3
	Sucralose	118	51.9	48.9		5.19

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		MS
			LCS	SMP	SMP	MS	
EPA 8321B	Triclopyr	105	70.9	70.3			0.844

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 8321B / E31780	Pesticides, herbicides, and other chemicals in water matrices by HPLC/MS/MS	1985268

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	04/18/2018	04/18/2018 12:00	Hoor Shaik	04/18/2018 18:49	S. M. Reddy	1985268
	04/18/2018	04/20/2018 10:00	Hoor Shaik	04/22/2018 11:25	Julie Michelle Frank	1985268
	04/18/2018	04/20/2018 10:00	Hoor Shaik	04/23/2018 02:26	Julie Michelle Frank	1985268
	04/18/2018	04/20/2018 10:00	Hoor Shaik	05/05/2018 00:07	Juyoung Kim	1985268