

Chemical Analysis Report

WQAP-2017-11-28-03

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

Event Description: **Collier Co Tracers & Markers**
Request ID: **RQ-2017-11-20-21**
Customer: **WQAP**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection - SROC
2295 Victoria AVE
Suite 364
Fort Myers, FL 33901
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 06-DEC-2017 16:47

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: Cypress Creek @ SR78, Upstream side

Collection Date/Time: 11/27/2017 10:56

Field ID: CYPRESSGR

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1948599	EPA 8321B	Sucralose**	0.034	I	ug/L	P335915	
	USGS O-2060-01	2,4-D	0.0020	U	ug/L	P335916	
		Diuron	0.0030	I	ug/L	P335916	
		Fenuron	0.0080	U	ug/L	P335916	
		Imidacloprid	0.011		ug/L	P335916	
		Bentazon	8.0E-04	U	ug/L	P335916	
		Linuron	0.0040	U	ug/L	P335916	
		Acetaminophen**	0.0080	U	ug/L	P335916	
		MCP	0.0020	U	ug/L	P335916	
		Carbamazepine**	4.0E-04	U	ug/L	P335916	
		Triclopyr**	0.0040	U	ug/L	P335916	
		Primidone**	0.0040	U	ug/L	P335916	
		Fluridone**	4.0E-04	U	ug/L	P335916	

Ref. Method and Comment:

USGS O-2060-01: MS accuracy for imidacloprid could not be assessed due to high concentration of parameter in the spiked sample.

Sample Location: Telegraph Creek @ SR78, Upstream side

Collection Date/Time: 11/27/2017 11:24

Field ID: 29-8GR

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1948600	EPA 8321B	Sucralose**	0.020	I	ug/L	P335915	
	USGS O-2060-01	2,4-D	0.0020	U	ug/L	P335916	
		Diuron	8.0E-04	U	ug/L	P335916	
		Fenuron	0.0080	U	ug/L	P335916	
		Imidacloprid	8.0E-04	U	ug/L	P335916	
		Bentazon	8.0E-04	U	ug/L	P335916	
		Linuron	0.0040	U	ug/L	P335916	
		Acetaminophen**	0.0080	U	ug/L	P335916	
		MCP	0.0020	U	ug/L	P335916	
		Carbamazepine**	4.0E-04	U	ug/L	P335916	
		Triclopyr**	0.0040	U	ug/L	P335916	
		Primidone**	0.0040	U	ug/L	P335916	
		Fluridone**	4.0E-04	U	ug/L	P335916	

Ref. Method and Comment:

USGS O-2060-01: MS accuracy for imidacloprid could not be assessed due to high concentration of parameter in the spiked sample.

Sample Location: Trout Creek @ SR78, Upstream side

Collection Date/Time: 11/27/2017 11:51

Field ID: 27-6GR

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1948601	EPA 8321B	Sucralose**	0.014	I	ug/L	P335915	
	USGS O-2060-01	2,4-D	0.0020	U	ug/L	P335916	
		Diuron	8.0E-04	U	ug/L	P335916	
		Fenuron	0.0080	U	ug/L	P335916	
		Imidacloprid	9.6E-04	I	ug/L	P335916	

Field ID: 27-6GR

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1948601	USGS O-2060-01	Bentazon	8.0E-04	U	ug/L	P335916	
		Linuron	0.0040	U	ug/L	P335916	
		Acetaminophen**	0.0080	U	ug/L	P335916	
		MCP	0.0020	U	ug/L	P335916	
		Carbamazepine**	4.0E-04	U	ug/L	P335916	
		Triclopyr**	0.0040	U	ug/L	P335916	
		Primidone**	0.0040	U	ug/L	P335916	
		Fluridone**	4.0E-04	U	ug/L	P335916	

Ref. Method and Comment:

USGS O-2060-01: MS accuracy for imidacloprid could not be assessed due to high concentration of parameter in the spiked sample.

Sample Location: Owl Creek @ SR78, Upstream side

Collection Date/Time: 11/27/2017 12:10

Field ID: 27O-GR20

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1948602	EPA 8321B	Sucralose**	0.084		ug/L	P335915	
	USGS O-2060-01	2,4-D	0.0020	U	ug/L	P335916	
		Diuron	8.0E-04	U	ug/L	P335916	
		Fenuron	0.0080	U	ug/L	P335916	
		Imidacloprid	8.4E-04	I	ug/L	P335916	
		Bentazon	8.0E-04	U	ug/L	P335916	
		Linuron	0.0040	U	ug/L	P335916	
		Acetaminophen**	0.0080	U	ug/L	P335916	
		MCP	0.0020	U	ug/L	P335916	
		Carbamazepine**	4.0E-04	U	ug/L	P335916	
		Triclopyr**	0.0040	U	ug/L	P335916	
		Primidone**	0.0040	U	ug/L	P335916	
		Fluridone**	4.0E-04	U	ug/L	P335916	

Ref. Method and Comment:

USGS O-2060-01: MS accuracy for imidacloprid could not be assessed due to high concentration of parameter in the spiked sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B

Batch ID: P335915

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: USGS O-2060-01

Batch ID: P335916

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	8.0E-04	U	ug/L
Fenuron	0.0080	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: USGS O-2060-01
Batch ID: P335916

Component	Result	Code	Units
Fluridone	4.0E-04	U	ug/L
Imidacloprid	8.0E-04	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: P335915

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	123		P	40 - 150

Reference Method: USGS O-2060-01
Batch ID: P335916

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	94.5		P	40 - 150
Acetaminophen	107		P	30 - 150
Bentazon	66.5		P	30 - 150
Carbamazepine	114		P	40 - 150
Diuron	105		P	40 - 150
Fenuron	112		P	40 - 150
Fluridone	106		P	40 - 150
Imidacloprid	98.6		P	40 - 160
Linuron	108		P	40 - 150
MCP	95.3		P	40 - 150
Primidone	99.3		P	40 - 150
Triclopyr	93.5		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P335915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1948302	Sucralose	120	133	P/P	40 - 150

Reference Method: USGS O-2060-01
Batch ID: P335916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1948303	Acetaminophen	95.4	97.8	P/P	30 - 150
1948303	Carbamazepine	106	111	P/P	40 - 150
1948303	Diuron	103	100	P/P	40 - 150
1948303	Fenuron	106	104	P/P	40 - 150
1948303	Fluridone	87.0	98.9	P/P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: USGS O-2060-01
 Batch ID: P335916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1948303	Linuron	106	108	P/P	40 - 150
1948303	Primidone	84.9	108	P/P	40 - 150
1948576	2,4-D	62.5	70.2	P/P	40 - 150
1948576	Bentazon	46.2	48.0	P/P	30 - 150
1948576	MCP	86.5	92.5	P/P	40 - 150
1948576	Triclopyr	81.4	91.6	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B
 Batch ID: P335915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1948302	Sucralose	10.0	Spike	P	0 - 30

Reference Method: USGS O-2060-01
 Batch ID: P335916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1948303	Acetaminophen	2.39	Spike	P	0 - 30
1948303	Carbamazepine	5.17	Spike	P	0 - 30
1948303	Diuron	1.85	Spike	P	0 - 30
1948303	Fenuron	2.31	Spike	P	0 - 30
1948303	Fluridone	12.6	Spike	P	0 - 30
1948303	Imidacloprid	4.75	Spike	P	0 - 30
1948303	Linuron	2.44	Spike	P	0 - 30
1948303	Primidone	23.8	Spike	P	0 - 30
1948576	2,4-D	8.67	Spike	P	0 - 30
1948576	Bentazon	2.91	Spike	P	0 - 30
1948576	MCP	6.64	Spike	P	0 - 30
1948576	Triclopyr	11.7	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: 1948599
 Field Sample ID: CYPRESSGR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	101	P	30 - 160
EPA 8321B	Carbamazepine-d10	120	P	30 - 160
EPA 8321B	Diuron-d6	107	P	30 - 160
EPA 8321B	Primidone-d5	98.6	P	30 - 160
EPA 8321B	Sucralose-d6	145	P	40 - 160
USGS O-2060-01	2,4-D-d3	85.1	P	30 - 160

Quality Assurance Report Surrogates

Lab Sample ID: 1948599

Field Sample ID: CYPRESSGR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
USGS O-2060-01	Acetaminophen-d4	101	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	120	P	30 - 160
USGS O-2060-01	Diuron-d6	107	P	30 - 160
USGS O-2060-01	Primidone-d5	98.6	P	30 - 160
USGS O-2060-01	Sucralose-d6	145	P	40 - 160

Lab Sample ID: 1948600

Field Sample ID: 29-8GR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	115	P	30 - 160
EPA 8321B	Carbamazepine-d10	83.5	P	30 - 160
EPA 8321B	Diuron-d6	76.2	P	30 - 160
EPA 8321B	Primidone-d5	69.6	P	30 - 160
EPA 8321B	Sucralose-d6	140	P	40 - 160
USGS O-2060-01	2,4-D-d3	73.6	P	30 - 160
USGS O-2060-01	Acetaminophen-d4	115	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	83.5	P	30 - 160
USGS O-2060-01	Diuron-d6	76.2	P	30 - 160
USGS O-2060-01	Primidone-d5	69.6	P	30 - 160
USGS O-2060-01	Sucralose-d6	140	P	40 - 160

Lab Sample ID: 1948601

Field Sample ID: 27-6GR

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	105	P	30 - 160
EPA 8321B	Carbamazepine-d10	111	P	30 - 160
EPA 8321B	Diuron-d6	101	P	30 - 160
EPA 8321B	Primidone-d5	89.2	P	30 - 160
EPA 8321B	Sucralose-d6	152	P	40 - 160
USGS O-2060-01	2,4-D-d3	77.9	P	30 - 160
USGS O-2060-01	Acetaminophen-d4	105	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	111	P	30 - 160
USGS O-2060-01	Diuron-d6	101	P	30 - 160
USGS O-2060-01	Primidone-d5	89.2	P	30 - 160
USGS O-2060-01	Sucralose-d6	152	P	40 - 160

Lab Sample ID: 1948602

Field Sample ID: 27O-GR20

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	103	P	30 - 160
EPA 8321B	Carbamazepine-d10	91.5	P	30 - 160
EPA 8321B	Diuron-d6	90.5	P	30 - 160
EPA 8321B	Primidone-d5	82.3	P	30 - 160
EPA 8321B	Sucralose-d6	139	P	40 - 160
USGS O-2060-01	2,4-D-d3	58.5	P	30 - 160
USGS O-2060-01	Acetaminophen-d4	103	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	91.5	P	30 - 160
USGS O-2060-01	Diuron-d6	90.5	P	30 - 160
USGS O-2060-01	Primidone-d5	82.3	P	30 - 160

Quality Assurance Report Surrogates

Lab Sample ID: 1948602
 Field Sample ID: 27O-GR20

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
USGS O-2060-01	Sucralose-d6	139	P	40 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
 Run ID: A80568
 Included Lab Sample IDs: 1948599, 1948600, 1948601, 1948602

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	127	123	P/P	60 - 150

Reference Method: USGS O-2060-01
 Run ID: A80657
 Included Lab Sample IDs: 1948599, 1948600, 1948601, 1948602

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	89.9	93.0	P/P	50 - 150
Acetaminophen	111	107	P/P	60 - 150
Bentazon	97.9	100	P/P	50 - 150
Carbamazepine	118	115	P/P	60 - 150
Diuron	111	113	P/P	60 - 150
Fenuron	108	109	P/P	60 - 150
Fluridone	118	116	P/P	60 - 160
Imidacloprid	100	106	P/P	60 - 150
Linuron	115	110	P/P	60 - 150
MCP	94.6	96.7	P/P	50 - 150
Primidone	103	110	P/P	60 - 150
Triclopyr	89.5	96.1	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	Sucralose	123	120 133			10.0
USGS O-2060-01	2,4-D	94.5	62.5 70.2			8.67
	Acetaminophen	107	95.4 97.8			2.39
	Bentazon	66.5	46.2 48.0			2.91
	Carbamazepine	114	106 111			5.17
	Diuron	105	103 100			1.85
	Fenuron	112	106 104			2.31
	Fluridone	106	87.0 98.9			12.6
	Imidacloprid	98.6				4.75
	Linuron	108	106 108			2.44
	MCP	95.3	86.5 92.5			6.64
	Primidone	99.3	84.9 108			23.8

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
			LCS	SMP	MS	
USGS O-2060-01	Triclopyr	93.5	81.4	91.6		11.7

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 8321B / E31780	Analysis of sucralose in water matrices by HPLC/MS/MS	1948599, 1948600, 1948601, 1948602
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1948599, 1948600, 1948601, 1948602
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1948599, 1948600, 1948601, 1948602

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	11/28/2017	11/29/2017	Juyoung Kim	11/30/2017	Juyoung Kim	1948599, 1948600, 1948601, 1948602
USGS O-2060-01	11/28/2017	11/28/2017	Hoor Shaik	12/01/2017	Julie Michelle Frank	1948599, 1948600, 1948601, 1948602
	11/28/2017	11/28/2017	Hoor Shaik	12/02/2017	Julie Michelle Frank	1948599, 1948600, 1948601, 1948602