

Chemical Analysis Report

SO-DIST-2017-11-09-01

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-2017-08-07-02**
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: Ben Paswater

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 04-DEC-2017 12:57



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: IMKFSMCK

Collection Date/Time: 11/08/2017 10:00

Field ID: AF44669

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1944971	EPA 8321B	Sucralose**	0.010	U	ug/L	P334973	
	USGS O-2060-01	2,4-D	0.0053	I	ug/L	P334865	
		Diuron	0.18		ug/L	P334865	
		Fenuron	0.0098	I	ug/L	P334865	
		Imidacloprid	0.14		ug/L	P334865	
		Bentazon	0.0011	I	ug/L	P334865	
		Linuron	0.0040	U	ug/L	P334865	
		Acetaminophen**	0.0080	U	ug/L	P334865	
		MCP	0.0020	U	ug/L	P334865	
		Carbamazepine**	4.0E-04	U	ug/L	P334865	
		Triclopyr**	0.0040	U	ug/L	P334865	
		Primidone**	0.0040	U	ug/L	P334865	
		Fluridone**	0.0025		ug/L	P334865	

Sample Location: IMKSLGH

Collection Date/Time: 11/08/2017 11:38

Field ID: AF44670

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1944972	EPA 8321B	Sucralose**	0.098		ug/L	P335143	
	USGS O-2060-01	2,4-D	0.0020	U	ug/L	P334865	
		Diuron	0.0035		ug/L	P334865	
		Fenuron	0.0080	U	ug/L	P334865	
		Imidacloprid	0.0073		ug/L	P334865	
		Bentazon	0.0010	I	ug/L	P334865	
		Linuron	0.0040	U	ug/L	P334865	
		Acetaminophen**	0.0080	U	ug/L	P334865	
		MCP	0.0020	U	ug/L	P334865	
		Carbamazepine**	4.0E-04	U	ug/L	P334865	
		Triclopyr**	0.0040	U	ug/L	P334865	
		Primidone**	0.0040	U	ug/L	P334865	
		Fluridone**	4.0E-04	U	ug/L	P334865	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P334973

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: EPA 8321B
Batch ID: P335143

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: USGS O-2060-01
 Batch ID: P334865

Component	Result	Code	Units
2,4-D	0.00200	U	ug/L
Acetaminophen	0.0080	U	ug/L
Bentazon	8.00E-04	U	ug/L
Carbamazepine	4.0E-04	U	ug/L
Diuron	8.0E-04	U	ug/L
Fenuron	0.0080	U	ug/L
Fluridone	4.0E-04	U	ug/L
Imidacloprid	8.0E-04	U	ug/L
Linuron	0.0040	U	ug/L
MCP	0.00200	U	ug/L
Primidone	0.0040	U	ug/L
Triclopyr	0.00400	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
 Batch ID: P334973

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	108		P	40 - 150

Reference Method: EPA 8321B
 Batch ID: P335143

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

Reference Method: USGS O-2060-01
 Batch ID: P334865

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	83.1		P	40 - 150
Acetaminophen	97.4		P	30 - 150
Bentazon	78.0		P	30 - 150
Carbamazepine	80.6		P	40 - 150
Diuron	84.9		P	40 - 150
Fenuron	84.4		P	40 - 150
Fluridone	77.9		P	40 - 150
Imidacloprid	78.9		P	40 - 160
Linuron	85.2		P	40 - 150
MCP	86.6		P	40 - 150
Primidone	82.6		P	40 - 150
Triclopyr	83.9		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P334973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1943952	Sucralose	71.9	77.2	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P335143

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1946400	Sucralose	115	142	P/P	40 - 150

Reference Method: USGS O-2060-01
Batch ID: P334865

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1945213	2,4-D	75.2	77.4	P/P	40 - 150
1945213	Acetaminophen	129	120	P/P	30 - 150
1945213	Bentazon	50.0	53.0	P/P	30 - 150
1945213	Carbamazepine	116	110	P/P	40 - 150
1945213	Diuron	130	122	P/P	40 - 150
1945213	Fenuron	113	112	P/P	40 - 150
1945213	Fluridone	98.0	104	P/P	40 - 150
1945213	Imidacloprid	133	129	P/P	40 - 160
1945213	Linuron	110	106	P/P	40 - 150
1945213	MCP	76.6	81.1	P/P	40 - 150
1945213	Primidone	128	125	P/P	40 - 150
1945213	Triclopyr	71.0	73.7	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P334973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1943952	Sucralose	6.76	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P335143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1946400	Sucralose	4.04	Spike	P	0 - 30

Reference Method: USGS O-2060-01
Batch ID: P334865

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1945213	2,4-D	2.84	Spike	P	0 - 30
1945213	Acetaminophen	7.41	Spike	P	0 - 30
1945213	Bentazon	5.81	Spike	P	0 - 30
1945213	Carbamazepine	5.48	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: USGS O-2060-01
 Batch ID: P334865

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1945213	Diuron	6.11	Spike	P	0 - 30
1945213	Fenuron	1.16	Spike	P	0 - 30
1945213	Fluridone	6.21	Spike	P	0 - 30
1945213	Imidacloprid	2.87	Spike	P	0 - 30
1945213	Linuron	3.53	Spike	P	0 - 30
1945213	MCP	5.76	Spike	P	0 - 30
1945213	Primidone	2.14	Spike	P	0 - 30
1945213	Triclopyr	3.68	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: 1944971
 Field Sample ID: AF44669

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	130	P	30 - 160
EPA 8321B	Carbamazepine-d10	77.0	P	30 - 160
EPA 8321B	Diuron-d6	60.7	P	30 - 160
EPA 8321B	Primidone-d5	95.1	P	30 - 160
EPA 8321B	Sucralose-d6	69.4	P	40 - 160
USGS O-2060-01	2,4-D-d3	74.0	P	30 - 160
USGS O-2060-01	Acetaminophen-d4	130	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	77.0	P	30 - 160
USGS O-2060-01	Diuron-d6	60.7	P	30 - 160
USGS O-2060-01	Primidone-d5	95.1	P	30 - 160
USGS O-2060-01	Sucralose-d6	69.4	P	40 - 160

Lab Sample ID: 1944972
 Field Sample ID: AF44670

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Acetaminophen-d4	119	P	30 - 160
EPA 8321B	Carbamazepine-d10	99.8	P	30 - 160
EPA 8321B	Diuron-d6	92.2	P	30 - 160
EPA 8321B	Primidone-d5	114	P	30 - 160
EPA 8321B	Sucralose-d6	144	P	40 - 160
USGS O-2060-01	2,4-D-d3	56.8	P	30 - 160
USGS O-2060-01	Acetaminophen-d4	119	P	30 - 160
USGS O-2060-01	Carbamazepine-d10	99.8	P	30 - 160
USGS O-2060-01	Diuron-d6	92.2	P	30 - 160
USGS O-2060-01	Primidone-d5	114	P	30 - 160
USGS O-2060-01	Sucralose-d6	144	P	40 - 160

Quality Assurance Report Calibration Verification

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A80274
Included Lab Sample IDs: 1944971

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	115	105	P/P	60 - 150

Reference Method: USGS O-2060-01
Run ID: A80279
Included Lab Sample IDs: 1944971, 1944972

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	97.8	92.0	P/P	50 - 150
Acetaminophen	137	133	P/P	60 - 150
Bentazon	89.4	86.3	P/P	50 - 150
Carbamazepine	116	115	P/P	60 - 150
Diuron	144	146	P/P	60 - 150
Fenuron	113	111	P/P	60 - 150
Fluridone	114	113	P/P	60 - 160
Imidacloprid	111	109	P/P	60 - 150
Linuron	126	117	P/P	60 - 150
MCP	95.5	97.6	P/P	50 - 150
Primidone	112	120	P/P	60 - 150
Triclopyr	93.2	90.0	P/P	50 - 150

Reference Method: EPA 8321B
Run ID: A80536
Included Lab Sample IDs: 1944972

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	79.8	81.7	P/P	60 - 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	108	71.9 77.2			6.76
	Sucralose	122	115 142			4.04
USGS O-2060-01	2,4-D	83.1	75.2 77.4			2.84
	Acetaminophen	97.4	129 120			7.41
	Bentazon	78.0	50.0 53.0			5.81
	Carbamazepine	80.6	116 110			5.48
	Diuron	84.9	130 122			6.11
	Fenuron	84.4	113 112			1.16
	Fluridone	77.9	98.0 104			6.21
	Imidacloprid	78.9	133 129			2.87
	Linuron	85.2	110 106			3.53
	MCP	86.6	76.6 81.1			5.76
	Primidone	82.6	128 125			2.14
	Triclopyr	83.9	71.0 73.7			3.68

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 8321B / E31780	Analysis of sucralose in water matrices by HPLC/MS/MS	1944971, 1944972
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1944971, 1944972
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1944971, 1944972

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	11/09/2017	11/13/2017	Juyoung Kim	11/14/2017	Juyoung Kim	1944971
	11/09/2017	11/22/2017	Mohammad Ghaffari	11/23/2017	Mohammad Ghaffari	1944972
USGS O-2060-01	11/09/2017	11/14/2017	Hoor Shaik	11/15/2017	Julie Michelle Frank	1944971, 1944972
	11/09/2017	11/14/2017	Hoor Shaik	11/16/2017	Julie Michelle Frank	1944971, 1944972