Chemical Analysis Report

SO-DIST-2016-09-29-02

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

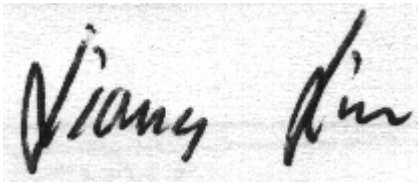
Event Description: **SMP: Everglades Lakes**
Request ID: **RQ-2016-09-26-16**
Customer: **SO-DIST**
Project ID: **SMP**

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

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 25-OCT-2016 10:40



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: Nutrients.

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: ENRE9 HARNEY RIVER **Collection Date/Time: 09/28/2016 11:11**

Field ID: G5SD0040 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1836197	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P312160	
	EPA 300.0 Rev. 2.1	Chloride	8.4E+03		mg Cl/L	P312592	
		Sulfate	1.1E+03		mg SO4/L	P312589	
	SM 2120 B	Color (true)	79	A	PCU	P312165	
	SM 2320 B-97	Total Alkalinity	159		mg CaCO3/L	P312577	
	SM 2540 C-97	TDS	1.40E+04		mg/L	P312958	
	SM 2540 D-97	TSS	4	I	mg/L	P312927	
	SM 4500 F-C-97	Fluoride	0.63		mg F/L	P312583	
1836198	EPA 350.1 Rev. 2.0	Ammonia-N	0.029		mg N/L	P312900	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P312781	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P312702	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P313108	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P312548	
1836199	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P312157	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P312160

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312589

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312592

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312781

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312702

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313108

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312157

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B
Batch ID: P312165

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P312577

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-97
Batch ID: P312958

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P312927

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P312548

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312589

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312592

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	101		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312781

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313108

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312157

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	102		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P312577

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P312548

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	105		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312589

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836280	Sulfate	92.5		P	90 - 110
1836283	Sulfate	93.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312592

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836280	Chloride	100		P	90 - 110
1836283	Chloride	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835656	Ammonia-N	95.3	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312781

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836119	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836113	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313108

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835638	Total-P	90.7	91.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312157

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836083	O-Phosphate-P	100	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836792	Fluoride	99.9	99.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P312548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835789	Organic Carbon	95.9	97.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P312160

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836133	Turbidity	4.96	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836283	Sulfate	1.93	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312592

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836283	Chloride	0.312	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835656	Ammonia-N	2.23	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836119	Kjeldahl Nitrogen	0.330	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836113	NO2NO3-N	0.460	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835638	Total-P	1.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836083	O-Phosphate-P	0.597	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P312165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836197	Color (true)	3.33	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P312577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836792	Total Alkalinity	0.427	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P312958

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836191	TDS	1.22	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P312583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836792	Fluoride	0.509	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P312548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835789	Organic Carbon	1.12	Spike	P	0 - 20

Quality Assurance Report
Precision

* 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
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71924
Included Lab Sample IDs: 1836199

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	98.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71925
Included Lab Sample IDs: 1836197

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A71926
Included Lab Sample IDs: 1836197

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71988
Included Lab Sample IDs: 1836197

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.4	98.7	P/P	90 - 110
Sulfate	94.3	96.2	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A72041
Included Lab Sample IDs: 1836198

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	103	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A72046
Included Lab Sample IDs: 1836197

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A72046
Included Lab Sample IDs: 1836197

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A72083
Included Lab Sample IDs: 1836198

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A72156
Included Lab Sample IDs: 1836198

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A72190
Included Lab Sample IDs: 1836198

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A72233
Included Lab Sample IDs: 1836198

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	99.8	P/P	90 - 110

* 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		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					4.96	
EPA 300.0 Rev. 2.1	Chloride	98.4	100	100		0.312	
	Sulfate	95.8	93.0	92.5		1.93	
EPA 350.1 Rev. 2.0	Ammonia-N	101	95.3	98.5			2.23
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	103	104			0.330
EPA 353.2 Rev. 2.0	NO2NO3-N	102	105	104			0.460
EPA 365.1 Rev. 2.0	Total-P	97.2	90.7	91.7			1.01
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	100	101			0.597
SM 2120 B	Color (true)					3.33	
SM 2320 B-97	Total Alkalinity	104				0.427	
SM 2540 C-97	TDS					1.22	
SM 4500 F-C-97	Fluoride	98.7	99.9	99.2			0.509
SM 5310 B-00	Organic Carbon	105	95.9	97.0			1.12

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1836197
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1836197
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1836197
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1836198
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1836198
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1836198
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1836198
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1836199
SM 2120 B / E31780	True Color measured at 450 nm	1836197
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1836197
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1836197
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1836197
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1836197
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1836198

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/29/2016			09/29/2016 15:56	Sima Feizi	1836197
EPA 300.0 Rev. 2.1	09/29/2016			10/06/2016	Ping Hua	1836197
EPA 350.1 Rev. 2.0	09/29/2016			10/07/2016	Sofia Elnemr	1836198
EPA 351.2 Rev. 2.0	09/29/2016	10/10/2016	Adrian Shelby	10/12/2016	Joseph Suarez	1836198
EPA 353.2 Rev. 2.0	09/29/2016			10/07/2016	Beverly Y. Sanders	1836198
EPA 365.1 Rev. 2.0	09/29/2016	10/13/2016	Vijayalakshmi Reddy	10/14/2016	Lipi Saha	1836198
EPA 365.1 Rev. 2.0 dissolved	09/29/2016			09/29/2016 16:23	Julia Storbeck	1836199
SM 2120 B	09/29/2016			09/29/2016 16:35	Julie Michelle Frank	1836197
SM 2320 B-97	09/29/2016			10/05/2016	Dale L. Simmons	1836197
SM 2540 C-97	09/29/2016			10/03/2016	Sima Feizi	1836197
SM 2540 D-97	09/29/2016			10/03/2016	Sima Feizi	1836197
SM 4500 F-C-97	09/29/2016			10/05/2016	Dale L. Simmons	1836197
SM 5310 B-00	09/29/2016			10/05/2016	Julie Michelle Frank	1836198