

Chemical Analysis Report

SO-DIST-2016-09-30-01

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

Event Description: **Sanibel Dune Lakes**
Request ID: **RQ-2016-09-26-13**
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: Colin Wright, Environmental Administrator

Date Certified: 28-OCT-2016 13:16

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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: 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: WEIR DOWNSTREAM DUNES LAKE 4

Collection Date/Time: 09/29/2016 09:25

Field ID: WEIR DOWNSTREAM DUNES LAKE 4

Matrix: WATER

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1836907	EPA 180.1 Rev. 2.0	Turbidity	8.8		NTU	P312240	
	EPA 300.0 Rev. 2.1	Chloride	2.6E+03		mg Cl/L	P312836	
		Sulfate	410		mg SO4/L	P312833	
	SM 2120 B	Color (true)	66	A	PCU	P312329	
	SM 2320 B-97	Total Alkalinity	172		mg CaCO3/L	P312576	
	SM 2540 C-97	TDS	4.92E+03		mg/L	P312773	
	SM 2540 D-97	TSS	3	I	mg/L	P312756	
	SM 4500 F-C-97	Fluoride	0.71		mg F/L	P312582	
1836908	EPA 350.1 Rev. 2.0	Ammonia-N	0.076		mg N/L	P313234	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.1		mg N/L	P312864	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P312703	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P313112	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P312546	
1836909	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.025		mg P/L	P312245	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 8790 umhos/cm.

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: P312240

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P312833

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P312836

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P313234

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P312864

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: P312703

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313112

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312245

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

Reference Method: SM 2120 B
Batch ID: P312329

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P312576

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

Reference Method: SM 2540 C-97
Batch ID: P312773

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P312756

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P312582

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P312546

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: P312833

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312836

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313234

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	103		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312864

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312703

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313112

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.9		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P312576

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P312582

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P312546

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	103		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P312833

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1837221	Sulfate	94.4		P	90 - 110
1837267	Sulfate	95.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P312836

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1837221	Chloride	96.3		P	90 - 110
1837267	Chloride	97.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P313234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836908	Ammonia-N	102	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P312864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836228	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P312703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836226	NO2NO3-N	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P313112

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836229	Total-P	94.0	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P312245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836760	O-Phosphate-P	96.0	97.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P312582

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836821	Fluoride	98.5	100	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P312546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1836883	Organic Carbon	97.6	109	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P312240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836881	Turbidity	7.41	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1837267	Sulfate	0.337	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P312836

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1837267	Chloride	0.131	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836908	Ammonia-N	0.696	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836228	Kjeldahl Nitrogen	1.27	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836226	NO2NO3-N	1.91	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313112

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836229	Total-P	4.40	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836760	O-Phosphate-P	1.07	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P312329

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836907	Color (true)	2.18	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P312576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836821	Total Alkalinity	0.385	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P312773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836945	TDS	4.10	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P312582

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836821	Fluoride	1.46	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P312546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1836883	Organic Carbon	7.45	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 180.1 Rev. 2.0

Run ID: A71953

Included Lab Sample IDs: 1836907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A71954

Included Lab Sample IDs: 1836909

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	97.6	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A71981

Included Lab Sample IDs: 1836907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115

Reference Method: SM 5310 B-00

Run ID: A72041

Included Lab Sample IDs: 1836908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.5	106	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A72046

Included Lab Sample IDs: 1836907

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

Reference Method: SM 4500 F-C-97

Run ID: A72046

Included Lab Sample IDs: 1836907

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72083

Included Lab Sample IDs: 1836908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A72131

Included Lab Sample IDs: 1836907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	98.0	P/P	90 - 110
Sulfate	99.0	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A72217

Included Lab Sample IDs: 1836908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72232

Included Lab Sample IDs: 1836908

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72241

Included Lab Sample IDs: 1836908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	102	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		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					7.41	
EPA 300.0 Rev. 2.1	Chloride	96.3	97.2	96.3		0.131	
	Sulfate	96.2	95.5	94.4		0.337	
EPA 350.1 Rev. 2.0	Ammonia-N	103	102	104			0.696
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.2	102	101			1.27
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	106			1.91
EPA 365.1 Rev. 2.0	Total-P	96.7	94.0	98.4			4.40
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	96.0	97.6			1.07
SM 2120 B	Color (true)					2.18	
SM 2320 B-97	Total Alkalinity	103				0.385	
SM 2540 C-97	TDS					4.10	
SM 4500 F-C-97	Fluoride	98.2	98.5	100			1.46
SM 5310 B-00	Organic Carbon	103	97.6	109			7.45

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1836907
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1836907
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1836907
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1836908
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1836908
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1836908
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1836908
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1836909
SM 2120 B / E31780	True Color measured at 450 nm	1836907
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1836907
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1836907
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1836907
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1836907
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1836908

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	09/30/2016			09/30/2016 15:11	Sima Feizi	1836907
EPA 300.0 Rev. 2.1	09/30/2016			10/11/2016	Ping Hua	1836907
EPA 350.1 Rev. 2.0	09/30/2016			10/13/2016	Sofia Elnemr	1836908
EPA 351.2 Rev. 2.0	09/30/2016	10/11/2016	Adrian Shelby	10/13/2016	Joseph Suarez	1836908
EPA 353.2 Rev. 2.0	09/30/2016			10/07/2016	Beverly Y. Sanders	1836908
EPA 365.1 Rev. 2.0	09/30/2016	10/13/2016	Vijayalakshmi Reddy	10/14/2016	Lipi Saha	1836908
EPA 365.1 Rev. 2.0 dissolved	09/30/2016			09/30/2016 16:14	Julia Storbeck	1836909
SM 2120 B	09/30/2016			09/30/2016 15:09	Blanca Fach	1836907
SM 2320 B-97	09/30/2016			10/05/2016	Dale L. Simmons	1836907
SM 2540 C-97	09/30/2016			10/03/2016	Yijie Li	1836907
SM 2540 D-97	09/30/2016			10/03/2016	Yijie Li	1836907
SM 4500 F-C-97	09/30/2016			10/05/2016	Dale L. Simmons	1836907
SM 5310 B-00	09/30/2016			10/04/2016	Julie Michelle Frank	1836908