

Chemical Analysis Report

CEN-DIST-2017-12-28-01

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

Event Description: **Haw Creek ab Cresent + HA**
Request ID: **RQ-2017-12-25-08**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 10-JAN-2018 10:23

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: 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: Haw Creek @

Collection Date/Time: 12/27/2017 11:20

Field ID: G2CE0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1956310	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P337571	
	EPA 300.0 Rev. 2.1	Chloride	47		mg Cl/L	P337660	
		Sulfate	7.1		mg SO4/L	P337661	
	SM 2120 B	Color (true)	920		PCU	P337575	
	SM 2320 B-97	Total Alkalinity	5.3		mg CaCO3/L	P337686	
	SM 2540 C-97	TDS	207		mg/L	P337794	
	SM 2540 D-97	TSS	7	I	mg/L	P337713	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P337688	
1956311	EPA 350.1 Rev. 2.0	Ammonia-N	0.20		mg N/L	P337855	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.2		mg N/L	P337651	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.056		mg N/L	P337623	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P337613	
	SM 5310 B-00	Organic Carbon	60		mg C/L	P337608	
1956312	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.025		mg P/L	P337601	

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: P337571

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P337660

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P337661

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P337855

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P337651

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: P337623

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337613

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337601

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

Reference Method: SM 2120 B
Batch ID: P337575

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P337686

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

Reference Method: SM 2540 C-97
Batch ID: P337794

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P337713

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P337688

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P337608

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: P337660

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337661

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337855

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: P337651

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337623

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: P337613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337601

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.7		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P337686

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P337688

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.7		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P337608

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P337660

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956218	Chloride	106		P	90 - 110
1956225	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P337661

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956218	Sulfate	105		P	90 - 110
1956225	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P337855

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956348	Ammonia-N	104	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P337651

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956362	Kjeldahl Nitrogen	93.7	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P337623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956250	NO2NO3-N	103	101	P/P	90 - 110
1956250	NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P337613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956257	Total-P	93.8	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P337601

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956258	O-Phosphate-P	96.1	97.3	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P337688

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956332	Fluoride	95.5	96.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P337608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956219	Organic Carbon	95.8	97.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P337571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956247	Turbidity	6.99	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956218	Chloride	1.80	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956218	Sulfate	2.75	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956348	Ammonia-N	2.19	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337651

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956362	Kjeldahl Nitrogen	1.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337623

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: P337623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956250	NO2NO3-N	0.773	Spike	P	0 - 15

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956257	Total-P	4.41	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337601

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956258	O-Phosphate-P	1.12	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P337575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956247	Color (true)	1.07	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P337686

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956332	Total Alkalinity	0.164	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P337794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956320	TDS	1.08	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P337688

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956332	Fluoride	0.476	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P337608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956219	Organic Carbon	1.33	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: A81169

Included Lab Sample IDs: 1956310

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: A81170

Included Lab Sample IDs: 1956310

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	100	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A81178

Included Lab Sample IDs: 1956312

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

Reference Method: SM 5310 B-00

Run ID: A81179

Included Lab Sample IDs: 1956311

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.9	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A81187

Included Lab Sample IDs: 1956311

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A81210

Included Lab Sample IDs: 1956310

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	106	P/P	90 - 110
Sulfate	103	106	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A81221

Included Lab Sample IDs: 1956310

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.0	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97
 Run ID: A81221
 Included Lab Sample IDs: 1956310

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A81232
 Included Lab Sample IDs: 1956311

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.7	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A81245
 Included Lab Sample IDs: 1956311

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A81300
 Included Lab Sample IDs: 1956311

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.3	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					6.99	
EPA 300.0 Rev. 2.1	Chloride	104	106	103		1.80	
	Sulfate	103	105	101		2.75	
EPA 350.1 Rev. 2.0	Ammonia-N	101	104	108			2.19
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.2	93.7	96.0			1.17
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	103	101		0.773 RSD
EPA 365.1 Rev. 2.0	Total-P	97.4	93.8	98.9			4.41
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	96.1	97.3			1.12
SM 2120 B	Color (true)					1.07	
SM 2320 B-97	Total Alkalinity	101				0.164	
SM 2540 C-97	TDS					1.08	
SM 4500 F-C-97	Fluoride	95.7	95.5	96.0			0.476
SM 5310 B-00	Organic Carbon	96.9	95.8	97.3			1.33

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
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Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1956310
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1956310
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1956310
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1956311
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1956311
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1956311
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1956311
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1956312
SM 2120 B / E31780	True Color measured at 450 nm	1956310
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1956310
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1956310
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1956310
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1956310
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1956311

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	12/28/2017			12/28/2017 14:58	DeAsia Armster	1956310
EPA 300.0 Rev. 2.1	12/28/2017			12/29/2017	Julia Storbeck	1956310
EPA 350.1 Rev. 2.0	12/28/2017			01/04/2018	Sofia Elnemr	1956311
EPA 351.2 Rev. 2.0	12/28/2017	01/02/2018	Adrian Shelby	01/02/2018	Joseph Suarez	1956311
EPA 353.2 Rev. 2.0	12/28/2017			12/29/2017	Beverly Y. Sanders	1956311
EPA 365.1 Rev. 2.0	12/28/2017	12/29/2017	Sima Feizi	01/03/2018	Lipi Saha	1956311
EPA 365.1 Rev. 2.0 dissolved	12/28/2017			12/28/2017 16:00	Megan Treadwell	1956312
SM 2120 B	12/28/2017			12/28/2017 15:52	Tanya Welborn	1956310
SM 2320 B-97	12/28/2017			12/29/2017	Dale L. Simmons	1956310
SM 2540 C-97	12/28/2017			12/29/2017	DeAsia Armster	1956310
SM 2540 D-97	12/28/2017			12/29/2017	DeAsia Armster	1956310
SM 4500 F-C-97	12/28/2017			12/29/2017	Dale L. Simmons	1956310
SM 5310 B-00	12/28/2017			12/28/2017	Megan Treadwell	1956311