

Chemical Analysis Report

CEN-DIST-2017-11-01-01

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

Event Description: **Cow Creek**
Request ID: **RQ-2017-10-30-68**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 22-NOV-2017 14:37



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: COW CREEK AT OSTEEN-MAYTOWN ROAD

Collection Date/Time: 10/31/2017 11:52

Field ID: G2CE0086

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1941657	EPA 180.1 Rev. 2.0	Turbidity	0.95		NTU	P334492	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P334689	
		Sulfate	0.28	I	mg SO4/L	P334692	
	SM 2120 B	Color (true)	970		PCU	P334497	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P334754	
	SM 2540 C-97	TDS	173		mg/L	P334918	
	SM 2540 D-97	TSS	2	U	mg/L	P334783	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P334756	
1941658	EPA 350.1 Rev. 2.0	Ammonia-N	0.22		mg N/L	P335180	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.3		mg N/L	P335107	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P334729	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P334558	
	SM 5310 B-00	Organic Carbon	76		mg C/L	P335426	
1941659	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P334490	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P334492

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P334689

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P334692

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P335180

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P335107

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: P334729

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334558

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334490

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

Reference Method: SM 2120 B
Batch ID: P334497

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P334754

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

Reference Method: SM 2540 C-97
Batch ID: P334918

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P334783

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P334756

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P335426

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: P334689

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334692

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335107

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334729

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: P334558

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334490

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

Reference Method: SM 2320 B-97
Batch ID: P334754

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

Reference Method: SM 4500 F-C-97
Batch ID: P334756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.4		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P335426

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941598	Chloride	101		P	90 - 110
1941694	Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941598	Sulfate	98.0		P	90 - 110
1941694	Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941603	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1943209	Kjeldahl Nitrogen	102	96.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334729

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941434	NO2NO3-N	99.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941679	Total-P	98.9	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334490

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941604	O-Phosphate-P	101	98.4	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P334756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941692	Fluoride	98.3	99.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P335426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941679	Organic Carbon	99.3	98.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P334492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941662	Turbidity	0.820	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941598	Chloride	1.43	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941598	Sulfate	1.14	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P335180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941603	Ammonia-N	0.00577	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1943209	Kjeldahl Nitrogen	5.47	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334729

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: P334729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941434	NO2NO3-N	0.183	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941679	Total-P	0.678	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334490

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941604	O-Phosphate-P	2.90	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P334497

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941599	Color (true)	0.421	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P334754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941692	Total Alkalinity	0.00718	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P334918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941693	TDS	3.96	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P334783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941715	TSS	5.41	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P334756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941692	Fluoride	0.964	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P335426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941679	Organic Carbon	0.314	Spike	P	0 - 20

* 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: SM 2120 B
Run ID: A79966
Included Lab Sample IDs: 1941657

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A79967
Included Lab Sample IDs: 1941659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	98.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A79968
Included Lab Sample IDs: 1941657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A80033
Included Lab Sample IDs: 1941658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	98.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A80039
Included Lab Sample IDs: 1941657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	101	P/P	90 - 110
Sulfate	102	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A80058
Included Lab Sample IDs: 1941658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A80074
Included Lab Sample IDs: 1941657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A80074
Included Lab Sample IDs: 1941657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A80229
Included Lab Sample IDs: 1941658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A80265
Included Lab Sample IDs: 1941658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.4	97.7	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A80314
Included Lab Sample IDs: 1941658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	101	100	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				0.820	
EPA 300.0 Rev. 2.1	Chloride	101	101	99.9	1.43	
	Sulfate	98.6	98.0	99.6	1.14	
EPA 350.1 Rev. 2.0	Ammonia-N	99.9	105	105		0.0057
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.3	102	96.3		5.47
EPA 353.2 Rev. 2.0	NO2NO3-N	104	99.8			0.183
EPA 365.1 Rev. 2.0	Total-P	102	98.9	98.2		0.678
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	101	98.4		2.90
SM 2120 B	Color (true)				0.421	
SM 2320 B-97	Total Alkalinity	104			0.0071	
SM 2540 C-97	TDS				3.96	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
SM 2540 D-97	TSS					5.41	
SM 4500 F-C-97	Fluoride	96.4	98.3	99.5			0.964
SM 5310 B-00	Organic Carbon	99.7	99.3	98.9			0.314

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1941657
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1941657
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1941657
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1941658
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1941658
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1941658
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1941658
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1941659
SM 2120 B / E31780	True Color measured at 450 nm	1941657
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1941657
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1941657
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1941657
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1941657
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1941658

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	11/01/2017			11/01/2017 16:13	DeAsia Armster	1941657
EPA 300.0 Rev. 2.1	11/01/2017			11/03/2017	Julia Storbeck	1941657
EPA 350.1 Rev. 2.0	11/01/2017			11/13/2017	Sofia Elnemr	1941658
EPA 351.2 Rev. 2.0	11/01/2017	11/13/2017	Adrian Shelby	11/14/2017	Tanya Welborn	1941658
EPA 353.2 Rev. 2.0	11/01/2017			11/06/2017	Beverly Y. Sanders	1941658
EPA 365.1 Rev. 2.0	11/01/2017	11/02/2017	Sima Feizi	11/03/2017	Lipi Saha	1941658
EPA 365.1 Rev. 2.0 dissolved	11/01/2017			11/01/2017 15:17	Megan Treadwell	1941659
SM 2120 B	11/01/2017			11/01/2017 15:49	Tanya Welborn	1941657
SM 2320 B-97	11/01/2017			11/03/2017	Dale L. Simmons	1941657
SM 2540 C-97	11/01/2017			11/03/2017	DeAsia Armster	1941657
SM 2540 D-97	11/01/2017			11/03/2017	DeAsia Armster	1941657
SM 4500 F-C-97	11/01/2017			11/03/2017	Dale L. Simmons	1941657
SM 5310 B-00	11/01/2017			11/15/2017	Ping Hua	1941658