

Chemical Analysis Report

SO-DIST-2016-05-18-03

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

Event Description: **SMP: Highlands LVI Red Water**
Request ID: **RQ-2016-05-16-14**
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
Timothy W. Fitzpatrick
Liang-Tsair Lin, Ph.D.
Colin Wright, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-JUN-2016 10:16

A handwritten signature in black ink, appearing to read "Liang Lin", is shown 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: RED WATER LAKE AT CENTER

Collection Date/Time: 05/17/2016 11:50

Field ID: SD051716-5

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1799748	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P304580	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P305006	
		Sulfate	32		mg SO4/L	P305008	
	SM 2120 B	Color (true)	21	A	PCU	P304562	
	SM 2320 B-97	Total Alkalinity	25		mg CaCO3/L	P304841	
	SM 2540 C-97	TDS	146		mg/L	P305233	
	SM 2540 D-97	TSS	11		mg/L	P305152	
	SM 4500 F-C-97	Fluoride	0.061	I	mg F/L	P304844	
1799749	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P305202	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P305081	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P304714	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P305320	
	SM 5310 B-00	Organic Carbon	9.3		mg C/L	P305285	
1799750	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P304539	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P304580

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P305006

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P305008

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P305202

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P305081

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: P304714

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305320

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P304539

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

Reference Method: SM 2120 B
Batch ID: P304562

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P304841

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

Reference Method: SM 2540 C-97
Batch ID: P305233

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P305152

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P304844

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P305285

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: P305006

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305008

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P305202

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305081

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304714

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305320

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P304539

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

Reference Method: SM 2320 B-97
Batch ID: P304841

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P304844

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P305285

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P305006

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1798794	Chloride	98.7		P	90 - 110
1799748	Chloride	97.3	97.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P305008

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1798794	Sulfate	96.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P305202

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1799749	Ammonia-N	96.6	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P305081

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1799778	Kjeldahl Nitrogen	104	95.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P304714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1799747	NO2NO3-N	99.4	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P305320

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1799740	Total-P	97.3	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P304539

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1799750	O-Phosphate-P	97.6	99.2	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P304844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1799498	Fluoride	102	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P305285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1799784	Organic Carbon	96.0	95.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P304580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799727	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305006

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799748	Chloride	0.0511	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305008

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799748	Sulfate	0.239	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P305202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799749	Ammonia-N	0.187	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799778	Kjeldahl Nitrogen	5.20	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304714

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: P304714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799747	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305320

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799740	Total-P	1.53	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P304539

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799750	O-Phosphate-P	1.63	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P304562

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799748	Color (true)	1.38	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P304841

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799498	Total Alkalinity	0.184	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P305233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799527	TDS	5.95	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P304844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799498	Fluoride	1.01	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P305285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1799784	Organic Carbon	0.496	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: A69552

Included Lab Sample IDs: 1799750

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.9	101	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A69558

Included Lab Sample IDs: 1799748

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A69569

Included Lab Sample IDs: 1799748

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69600

Included Lab Sample IDs: 1799749

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

Reference Method: SM 2320 B-97

Run ID: A69640

Included Lab Sample IDs: 1799748

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.6	99.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A69640

Included Lab Sample IDs: 1799748

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A69676

Included Lab Sample IDs: 1799748

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	98.6	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69737

Included Lab Sample IDs: 1799749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69753

Included Lab Sample IDs: 1799749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.9	96.8	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A69764

Included Lab Sample IDs: 1799749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69815

Included Lab Sample IDs: 1799749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	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				0.0	
EPA 300.0 Rev. 2.1	Chloride	100	97.3	97.4		0.0511
	Sulfate	98.2	96.3			0.239
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	96.6	96.4		0.187
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	104	95.0		5.20
EPA 353.2 Rev. 2.0	NO2NO3-N	101	99.4	98.9		0.491
EPA 365.1 Rev. 2.0	Total-P	99.8	97.3	98.9		1.53
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	97.6	99.2		1.63
SM 2120 B	Color (true)				1.38	
SM 2320 B-97	Total Alkalinity	102			0.184	
SM 2540 C-97	TDS				5.95	
SM 4500 F-C-97	Fluoride	99.5	102	101		1.01
SM 5310 B-00	Organic Carbon	97.8	96.0	95.2		0.496

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	1799748
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1799748
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1799748
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1799749
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1799749
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1799749
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1799749
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1799750
SM 2120 B / E31780	True Color measured at 450 nm	1799748
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1799748
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1799748
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1799748
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1799748
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1799749

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	05/18/2016			05/18/2016 15:38	Sima Feizi	1799748
EPA 300.0 Rev. 2.1	05/18/2016			05/25/2016	Ping Hua	1799748
EPA 350.1 Rev. 2.0	05/18/2016			05/26/2016	Diana M. Turner	1799749
EPA 351.2 Rev. 2.0	05/18/2016	05/26/2016	Sofia Elnemr	05/27/2016	Vijayalakshmi Reddy	1799749
EPA 353.2 Rev. 2.0	05/18/2016			05/20/2016	Peter D. Kaus	1799749
EPA 365.1 Rev. 2.0	05/18/2016	05/31/2016	Vijayalakshmi Reddy	06/02/2016	Rochelle Y Jackson	1799749
EPA 365.1 Rev. 2.0 dissolved	05/18/2016			05/18/2016 14:42	Julia Storbeck	1799750
SM 2120 B	05/18/2016			05/19/2016 00:10	Rochelle Y Jackson	1799748
SM 2320 B-97	05/18/2016			05/21/2016	Dale L. Simmons	1799748
SM 2540 C-97	05/18/2016			05/19/2016	Yijie Li	1799748
SM 2540 D-97	05/18/2016			05/19/2016	Yijie Li	1799748
SM 4500 F-C-97	05/18/2016			05/21/2016	Dale L. Simmons	1799748
SM 5310 B-00	05/18/2016			05/28/2016	Diana M. Turner	1799749