

Chemical Analysis Report

CEN-DIST-2016-02-16-01

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

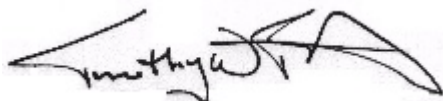
Event Description: **East Toho Drain**
Request ID: **RQ-2016-02-15-69**
Customer: **CEN-DIST**
Project ID: **SMP**

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

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Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 03-MAR-2016 10:06

A handwritten signature in black ink, appearing to read "Timothy Fitzpatrick", is written over a light blue 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: Boggy Creek

Collection Date/Time: 02/15/2016 10:25

Field ID: G4CE0094

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1771244	EPA 180.1 Rev. 2.0	Turbidity	0.95		NTU	P298692	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P298858	
		Sulfate	8.5		mg SO4/L	P298857	
	SM 2120 B	Color (true)	89		PCU	P298682	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P299109	
	SM 2540 C-97	TDS	101		mg/L	P299080	
	SM 2540 D-97	TSS	2	U	mg/L	P299018	
	SM 4500 F-C-97	Fluoride	0.062	I	mg F/L	P299043	
1771245	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P298873	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.55		mg N/L	P298886	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P298977	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P298893	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P299136	
1771246	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P298675	

Ref. Method and Comment:

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: P298692

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P298857

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P298858

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P298873

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P298886

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: P298977

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298893

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298675

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

Reference Method: SM 2120 B
Batch ID: P298682

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P299109

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

Reference Method: SM 2540 C-97
Batch ID: P299080

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P299018

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P299043

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P299136

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: P298857

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298858

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298873

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298886

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.7		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298977

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298893

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298675

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

Reference Method: SM 2320 B-97
Batch ID: P299109

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

Reference Method: SM 4500 F-C-97
Batch ID: P299043

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	94 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P299136

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P298857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771192	Sulfate	100		P	90 - 110
1771193	Sulfate	99.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P298858

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771192	Chloride	103		P	90 - 110
1771193	Chloride	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P298873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771196	Ammonia-N	96.5	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P298886

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771245	Kjeldahl Nitrogen	104	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P298977

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771196	NO2NO3-N	98.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P298893

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771224	Total-P	102	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P298675

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771200	O-Phosphate-P	101	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P299043

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770959	Fluoride	97.6	98.8	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P299136

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771278	Organic Carbon	95.4	91.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771190	Turbidity	6.63	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771192	Sulfate	0.142	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298858

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771192	Chloride	0.699	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771196	Ammonia-N	1.04	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771245	Kjeldahl Nitrogen	0.122	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298977

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: P298977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771196	NO2NO3-N	0.302	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298893

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771224	Total-P	2.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298675

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771200	O-Phosphate-P	0.984	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P298682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771190	Color (true)	0.252	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P299109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770959	Total Alkalinity	0.847	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P299080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771220	TDS	1.70	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P299043

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770959	Fluoride	1.01	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P299136

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771278	Organic Carbon	2.25	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: A67625

Included Lab Sample IDs: 1771246

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.0	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A67630

Included Lab Sample IDs: 1771244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A67632

Included Lab Sample IDs: 1771244

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A67638

Included Lab Sample IDs: 1771244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	99.0	94.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A67680

Included Lab Sample IDs: 1771245

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A67721

Included Lab Sample IDs: 1771245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A67735

Included Lab Sample IDs: 1771245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A67743
Included Lab Sample IDs: 1771244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67744
Included Lab Sample IDs: 1771245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A67766
Included Lab Sample IDs: 1771244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A67778
Included Lab Sample IDs: 1771245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	92.8	93.4	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				6.63	
EPA 300.0 Rev. 2.1	Chloride	104	103	103	0.699	
	Sulfate	99.3	100	99.0	0.142	
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	96.5	98.1		1.04
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7	104	104		0.122
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	98.0	98.5		0.302
EPA 365.1 Rev. 2.0	Total-P	103	102	99.1		2.12
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	101	102		0.984
SM 2120 B	Color (true)				0.252	
SM 2320 B-97	Total Alkalinity	101			0.847	
SM 2540 C-97	TDS				1.70	
SM 4500 F-C-97	Fluoride	97.6	97.6	98.8		1.01
SM 5310 B-00	Organic Carbon	92.8	95.4	91.7		2.25

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	1771244
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1771244
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1771244
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1771245
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1771245
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1771245
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1771245
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1771246
SM 2120 B / E31780	True Color measured at 450 nm	1771244
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1771244
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1771244
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1771244
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1771244
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1771245

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	02/16/2016			02/16/2016 15:33	Sima Feizi	1771244
EPA 300.0 Rev. 2.1	02/16/2016			02/18/2016	Julia Storbeck	1771244
EPA 350.1 Rev. 2.0	02/16/2016			02/18/2016	Diana M. Turner	1771245
EPA 351.2 Rev. 2.0	02/16/2016	02/19/2016	Christopher Armour	02/22/2016	Bryan A. Werth	1771245
EPA 353.2 Rev. 2.0	02/16/2016			02/19/2016	Virginia P. Brown	1771245
EPA 365.1 Rev. 2.0	02/16/2016	02/19/2016	Christopher Armour	02/22/2016	Lipi Saha	1771245
EPA 365.1 Rev. 2.0 dissolved	02/16/2016			02/16/2016 14:21	Bryan A. Werth	1771246
SM 2120 B	02/16/2016			02/16/2016 14:46	Blanca Fach	1771244
SM 2320 B-97	02/16/2016			02/23/2016	Dale L. Simmons	1771244
SM 2540 C-97	02/16/2016			02/17/2016	Yijie Li	1771244
SM 2540 D-97	02/16/2016			02/17/2016	Yijie Li	1771244
SM 4500 F-C-97	02/16/2016			02/22/2016	Dale L. Simmons	1771244
SM 5310 B-00	02/16/2016			02/22/2016	Sofia Elnemr	1771245