

Chemical Analysis Report

CEN-DIST-2016-05-04-01

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

Event Description: **Coon Lake+LVI**
Request ID: **RQ-2016-05-02-74**
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
Attn: Mike Linger

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Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 31-MAY-2016 14:35

A handwritten signature in black ink, appearing to read "Timothy Fitzpatrick", with a stylized flourish at the end.

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: COON LAKE MID-RADIAL NORTH

Collection Date/Time: 05/03/2016 12:33

Field ID: G4CE0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1795326	EPA 180.1 Rev. 2.0	Turbidity	2.8	A	NTU	P303538	
	EPA 300.0 Rev. 2.1	Chloride	21	A	mg Cl/L	P304193	
		Sulfate	5.2	A	mg SO4/L	P304197	
	SM 2120 B	Color (true)	330		PCU	P303557	
	SM 2320 B-97	Total Alkalinity	2.8		mg CaCO3/L	P304115	
	SM 2540 C-97	TDS	128		mg/L	P304338	
	SM 2540 D-97	TSS	3	I	mg/L	P304169	
	SM 4500 F-C-97	Fluoride	0.049	I	mg F/L	P304122	
1795327	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P304086	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P304413	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.050		mg N/L	P304158	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P304473	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P304743	
1795328	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P303551	

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: P303538

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P304193

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P304197

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P304086

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P304413

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: P304158

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304473

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303551

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

Reference Method: SM 2120 B
Batch ID: P303557

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P304115

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

Reference Method: SM 2540 C-97
Batch ID: P304338

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P304169

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P304122

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P304743

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: P304193

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304197

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304086

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	93.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304413

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304158

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: P304473

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: P303551

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

Reference Method: SM 2320 B-97
Batch ID: P304115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P304122

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P304743

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P304193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795326	Chloride	97.2		P	90 - 110
1795377	Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P304197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795326	Sulfate	96.5		P	90 - 110
1795377	Sulfate	96.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P304086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795358	Ammonia-N	92.7	96.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P304413

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795308	Kjeldahl Nitrogen	96.5	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P304158

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795343	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P304473

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795359	Total-P	99.6	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P303551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795368	O-Phosphate-P	101	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P304122

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1795378	Fluoride	96.0	98.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P304743

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793864	Organic Carbon	95.9	97.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P303538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795326	Turbidity	0.359	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795326	Chloride	0.145	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P304197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795326	Sulfate	0.941	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P304086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795358	Ammonia-N	2.31	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795308	Kjeldahl Nitrogen	4.56	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P304158

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: P304158

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795343	NO2NO3-N	0.712	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P304473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795359	Total-P	2.98	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795368	O-Phosphate-P	0.295	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P303557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795349	Color (true)	0.349	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P304115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795378	Total Alkalinity	0.242	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P304338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795307	TDS	3.49	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P304122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1795378	Fluoride	1.96	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P304743

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793864	Organic Carbon	1.87	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: A69278

Included Lab Sample IDs: 1795326

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A69280

Included Lab Sample IDs: 1795328

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

Reference Method: SM 2120 B

Run ID: A69281

Included Lab Sample IDs: 1795326

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A69423

Included Lab Sample IDs: 1795326

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69427

Included Lab Sample IDs: 1795327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	95.4	95.2	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A69434

Included Lab Sample IDs: 1795326

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A69434

Included Lab Sample IDs: 1795326

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69443

Included Lab Sample IDs: 1795327

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69546

Included Lab Sample IDs: 1795327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69571

Included Lab Sample IDs: 1795327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	93.4	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A69609

Included Lab Sample IDs: 1795327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.4	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				0.359	
EPA 300.0 Rev. 2.1	Chloride	99.8	97.2 99.3		0.145	
	Sulfate	97.8	96.5 96.6		0.941	
EPA 350.1 Rev. 2.0	Ammonia-N	93.9	92.7 96.3			2.31
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.9	96.5 104			4.56
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102			0.712
EPA 365.1 Rev. 2.0	Total-P	103	99.6 103			2.98
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	101 102			0.295
SM 2120 B	Color (true)				0.349	
SM 2320 B-97	Total Alkalinity	103			0.242	
SM 2540 C-97	TDS				3.49	
SM 4500 F-C-97	Fluoride	99.0	96.0 98.5			1.96
SM 5310 B-00	Organic Carbon	96.6	95.9 97.9			1.87

Reference Method Descriptions

Method / DoH Cert #

Description

Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1795326
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1795326
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1795326
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1795327
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1795327
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1795327
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1795327
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1795328
SM 2120 B / E31780	True Color measured at 450 nm	1795326
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1795326
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1795326
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1795326
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1795326
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1795327

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	05/04/2016			05/04/2016 15:16	Sima Feizi	1795326
EPA 300.0 Rev. 2.1	05/04/2016			05/12/2016	Elisa J Lutz	1795326
EPA 350.1 Rev. 2.0	05/04/2016			05/11/2016	Diana M. Turner	1795327
EPA 351.2 Rev. 2.0	05/04/2016	05/18/2016	Sofia Elnemr	05/19/2016	Christopher Armour	1795327
EPA 353.2 Rev. 2.0	05/04/2016			05/12/2016	Peter D. Kaus	1795327
EPA 365.1 Rev. 2.0	05/04/2016	05/17/2016	Vijayalakshmi Reddy	05/18/2016	Lipi Saha	1795327
EPA 365.1 Rev. 2.0 dissolved	05/04/2016			05/04/2016 15:23	Julia Storbeck	1795328
SM 2120 B	05/04/2016			05/04/2016 14:44	Rochelle Y Jackson	1795326
SM 2320 B-97	05/04/2016			05/11/2016	Dale L. Simmons	1795326
SM 2540 C-97	05/04/2016			05/06/2016	Yijie Li	1795326
SM 2540 D-97	05/04/2016			05/06/2016	Yijie Li	1795326
SM 4500 F-C-97	05/04/2016			05/11/2016	Dale L. Simmons	1795326
SM 5310 B-00	05/04/2016			05/20/2016	Ping Hua	1795327