

Chemical Analysis Report

WQ-ASSESS-2017-03-15-01

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

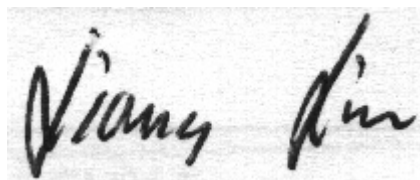
Event Description: **Merrits Mill Pond**
Request ID: **RQ-2017-03-13-18**
Customer: **WQ-ASSESS**
Project ID: **BMAP**

Send Reports to:
FL Dept. of Environmental Protection
Division Of Water Facilities, FL DEP
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 11-APR-2017 15:29

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 groups are included in this report: Metals and 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: MERRITT'S MILL POND 600 METERS
 DOWNSTREAM OF JACKSON BLUE SPRING**

Collection Date/Time: 03/15/2017 09:45

Field ID: G2WA0007-03152017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1880388	EPA 180.1 Rev. 2.0	Turbidity	0.15		NTU	P321636	
	EPA 300.0 Rev. 2.1	Chloride	4.4		mg Cl/L	P322223	
		Sulfate	1.3		mg SO4/L	P322409	
	SM 2120 B	Color (true)	2.5	U	PCU	P321610	
	SM 2320 B-97	Total Alkalinity	123	A	mg CaCO3/L	P321868	
	SM 2540 C-97	TDS	161		mg/L	P322315	
	SM 2540 D-97	TSS	2	U	mg/L	P322178	
	SM 4500 F-C-97	Fluoride	0.039	I	mg F/L	P321871	
1880391	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P321776	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.11	I	mg N/L	P321798	
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.4		mg N/L	P321961	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P321797	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P321721	
1880394	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P321631	
1880408	EPA 200.7 Rev. 4.4	Calcium	52.3		mg/L	P321845	
		Iron	30	U	ug/L	P321845	
		Magnesium	2.36		mg/L	P321845	
		Potassium	0.43	I	mg/L	P321845	
		Sodium	1.9	I	mg/L	P321845	
		Zinc	5.0	U	ug/L	P321845	
	EPA 200.8 Rev. 5.4	Arsenic	0.29		ug/L	P321845	
		Cadmium	0.020	U	ug/L	P321845	
		Chromium	1.1	I	ug/L	P321845	
		Copper	0.20	U	ug/L	P321845	
		Lead	0.050	U	ug/L	P321845	
		Nickel	0.20	U	ug/L	P321845	
		Silver	0.010	U	ug/L	P321845	

Ref. Method and Comment:

SM 2120 B: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

**Sample Location: MERRITT'S MILL POND MID UNDER
 POWERLINES**

Collection Date/Time: 03/15/2017 10:15

Field ID: G2WA0008-03152017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1880389	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P321636	
	EPA 300.0 Rev. 2.1	Chloride	4.5		mg Cl/L	P322223	
		Sulfate	1.4		mg SO4/L	P322409	
	SM 2120 B	Color (true)	2.5	U	PCU	P321610	
	SM 2320 B-97	Total Alkalinity	129		mg CaCO3/L	P321868	
	SM 2540 C-97	TDS	160		mg/L	P322315	
	SM 2540 D-97	TSS	2	I	mg/L	P322178	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P321871	

Field ID: G2WA0008-03152017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1880392	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P321776	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23		mg N/L	P321798	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.8		mg N/L	P321961	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P321825	
	SM 5310 B-00	Organic Carbon	0.66	I	mg C/L	P321721	
1880395	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P321631	
1880409	EPA 200.7 Rev. 4.4	Calcium	53.7		mg/L	P321845	
		Iron	30	U	ug/L	P321845	
		Magnesium	2.71		mg/L	P321845	
		Potassium	0.44	I	mg/L	P321845	
		Sodium	2.0	I	mg/L	P321845	
		Zinc	5.0	U	ug/L	P321845	
	EPA 200.8 Rev. 5.4	Arsenic	0.29		ug/L	P321845	
		Cadmium	0.020	U	ug/L	P321845	
		Chromium	0.90	I	ug/L	P321845	
		Copper	0.20	U	ug/L	P321845	
		Lead	0.050	U	ug/L	P321845	
		Nickel	0.20	U	ug/L	P321845	
		Silver	0.010	U	ug/L	P321845	

Ref. Method and Comment:

SM 2120 B: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

**Sample Location: MERRITT'S MILL POND 500 METERS
UPSTREAM OF DAM**

Collection Date/Time: 03/15/2017 10:35

Field ID: G2WA0009-03152017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1880390	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P321636	
	EPA 300.0 Rev. 2.1	Chloride	4.6		mg Cl/L	P322223	
		Sulfate	1.3		mg SO4/L	P322409	
		Color (true)	4.2	I	PCU	P321610	
	SM 2320 B-97	Total Alkalinity	125		mg CaCO3/L	P321868	
	SM 2540 C-97	TDS	162	A	mg/L	P322316	
	SM 2540 D-97	TSS	3	I	mg/L	P322179	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P321871	
1880393	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P321776	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P321798	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.3		mg N/L	P321961	
	EPA 365.1 Rev. 2.0	Total-P	0.010		mg P/L	P321825	
	SM 5310 B-00	Organic Carbon	1.1		mg C/L	P321721	
1880396	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P321631	
1880410	EPA 200.7 Rev. 4.4	Calcium	51.0		mg/L	P321845	
		Iron	35	I	ug/L	P321845	
		Magnesium	2.69		mg/L	P321845	

Field ID: G2WA0009-03152017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1880410	EPA 200.7 Rev. 4.4	Potassium	0.42	I	mg/L	P321845	
		Sodium	2.0	I	mg/L	P321845	
		Zinc	5.0	U	ug/L	P321845	
	EPA 200.8 Rev. 5.4	Arsenic	0.28		ug/L	P321845	
		Cadmium	0.020	U	ug/L	P321845	
		Chromium	0.74	I	ug/L	P321845	
		Copper	0.20	U	ug/L	P321845	
		Lead	0.050	U	ug/L	P321845	
		Nickel	0.20	U	ug/L	P321845	
		Silver	0.010	U	ug/L	P321845	

Ref. Method and Comment:

SM 2120 B: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: QC-DUPLICATE MERRITT'S MILL POND 500 METERS UPSTREAM OF DAM

Collection Date/Time: 03/15/2017 10:45

Field ID: G2WA0009-03152017D

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1880397	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P321636	
	EPA 300.0 Rev. 2.1	Chloride	4.6		mg Cl/L	P322223	
		Sulfate	1.3		mg SO4/L	P322409	
		SM 2120 B	Color (true)	3.1	I	PCU	P321610
	SM 2320 B-97	Total Alkalinity	125		mg CaCO3/L	P321868	
	SM 2540 C-97	TDS	159		mg/L	P322316	
	SM 2540 D-97	TSS	3	I	mg/L	P322179	
	SM 4500 F-C-97	Fluoride	0.042	I	mg F/L	P321871	
	1880398	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P321776
EPA 351.2 Rev. 2.0		Kjeldahl Nitrogen	0.25		mg N/L	P321798	
EPA 353.2 Rev. 2.0		NO2NO3-N	2.3		mg N/L	P321961	
EPA 365.1 Rev. 2.0		Total-P	0.01		mg P/L	P321825	
SM 5310 B-00		Organic Carbon	1.1		mg C/L	P321721	
1880399	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P321631	
1880411	EPA 200.7 Rev. 4.4	Calcium	50.5		mg/L	P321845	
		Iron	39	I	ug/L	P321845	
		Magnesium	2.67		mg/L	P321845	
		Potassium	0.39	I	mg/L	P321845	
		Sodium	2.0	I	mg/L	P321845	
		Zinc	5.0	U	ug/L	P321845	
	EPA 200.8 Rev. 5.4	Arsenic	0.28		ug/L	P321845	
		Cadmium	0.020	U	ug/L	P321845	
		Chromium	0.74	I	ug/L	P321845	
		Copper	0.20	U	ug/L	P321845	
		Lead	0.050	U	ug/L	P321845	
		Nickel	0.20	U	ug/L	P321845	
		Silver	0.010	U	ug/L	P321845	

Field ID: G2WA0009-03152017D

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
Ref. Method and Comment:							
SM 2120 B: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.							
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.							

Sample Location: QC BLANK

Collection Date/Time: 03/15/2017 10:45

Field ID: G2WA0009-03152017B

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1880400	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P321636	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P322223	
		Sulfate	0.20	U	mg SO4/L	P322409	
	SM 2120 B	Color (true)	2.5	U	PCU	P321610	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P321868	
	SM 2540 C-97	TDS	15	U	mg/L	P322310	
	SM 2540 D-97	TSS	2	U	mg/L	P322173	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P321871	
1880401	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P321776	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P321799	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P321961	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P321825	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P321721	
1880402	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P321631	
1880412	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P321845	
		Iron	30	U	ug/L	P321845	
		Magnesium	0.040	U	mg/L	P321845	
		Potassium	0.30	U	mg/L	P321845	
		Sodium	0.50	U	mg/L	P321845	
		Zinc	5.0	U	ug/L	P321845	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P321845	
		Cadmium	0.020	U	ug/L	P321845	
		Chromium	0.40	U	ug/L	P321845	
		Copper	0.20	U	ug/L	P321845	
		Lead	0.050	U	ug/L	P321845	
		Nickel	0.20	U	ug/L	P321845	
		Silver	0.010	U	ug/L	P321845	

Ref. Method and Comment:
 SM 2120 B: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
 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: P321636

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321845

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321845

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322223

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322409

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321776

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321798

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321799

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: P321961

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321797

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321825

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321631

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

Reference Method: SM 2120 B
Batch ID: P321610

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P321868

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

Reference Method: SM 2540 C-97
Batch ID: P322310

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P322315

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P322316

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
 Batch ID: P322173

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P322178

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P322179

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P321871

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P321721

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P321845

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	102		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	99.5		P	85 - 115
Sodium	100		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P321845

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	100		P	85 - 115
Copper	100		P	85 - 115
Lead	98.9		P	85 - 115
Nickel	91.1		P	85 - 115
Silver	100		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322223

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	94.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322409

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321776

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: P321798

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321961

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321797

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321825

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321631

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P321868

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P321871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P321721

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880410	Calcium	97.7		P	80 - 120
1880410	Iron	101	101	P/P	80 - 120
1880410	Magnesium	102	104	P/P	80 - 120
1880410	Potassium	98.2	99.6	P/P	80 - 120
1880410	Sodium	99.7	101	P/P	80 - 120
1880410	Zinc	97.8	97.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880410	Arsenic	98.4	98.8	P/P	80 - 120
1880410	Cadmium	98.1	97.1	P/P	80 - 120
1880410	Chromium	99.2	99.3	P/P	80 - 120
1880410	Copper	96.3	95.4	P/P	80 - 120
1880410	Lead	97.7	98.4	P/P	80 - 120
1880410	Nickel	93.7	94.0	P/P	80 - 120
1880410	Silver	101	100	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322223

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880198	Chloride	93.5		P	90 - 110
1880354	Chloride	93.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322409

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322409

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880198	Sulfate	101		P	90 - 110
1880354	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880378	Ammonia-N	102	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321798

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880357	Kjeldahl Nitrogen	94.4	93.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880438	Kjeldahl Nitrogen	96.2	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321961

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880378	NO2NO3-N	96.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321797

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880357	Total-P	99.6	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321825

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880392	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321631

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880394	O-Phosphate-P	98.1	97.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P321871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880388	Fluoride	96.6	96.1	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P321721

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1880391	Organic Carbon	97.4	98.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P321636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880354	Turbidity	1.03	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P321845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880410	Calcium	2.95	Spike	P	0 - 20
1880410	Iron	0.439	Spike	P	0 - 20
1880410	Magnesium	1.55	Spike	P	0 - 20
1880410	Potassium	1.27	Spike	P	0 - 20
1880410	Sodium	0.830	Spike	P	0 - 20
1880410	Zinc	0.0609	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P321845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880410	Arsenic	0.338	Spike	P	0 - 20
1880410	Cadmium	0.980	Spike	P	0 - 20
1880410	Chromium	0.0350	Spike	P	0 - 20
1880410	Copper	0.937	Spike	P	0 - 20
1880410	Lead	0.724	Spike	P	0 - 20
1880410	Nickel	0.353	Spike	P	0 - 20
1880410	Silver	0.830	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322223

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880198	Chloride	0.0537	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880198	Sulfate	3.67	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P321776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880378	Ammonia-N	1.18	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321798

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880357	Kjeldahl Nitrogen	1.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P321799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880438	Kjeldahl Nitrogen	3.59	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P321961

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880378	NO2NO3-N	1.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321797

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880357	Total-P	2.34	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P321825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880392	Total-P	0.381	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P321631

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880394	O-Phosphate-P	0.951	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P321868

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880388	Total Alkalinity	0.0966	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P322310

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1879737	TDS	3.14	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P322315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880376	TDS	2.56	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P322316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880390	TDS	3.10	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P321871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880388	Fluoride	0.498	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P321721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1880391	Organic Carbon	0.563	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: A75119
Included Lab Sample IDs: 1880388, 1880389, 1880390, 1880397, 1880400

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	98.8	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A75129
Included Lab Sample IDs: 1880394, 1880395, 1880396, 1880399, 1880402

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	100	99.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A75129

Included Lab Sample IDs: 1880394, 1880395, 1880396, 1880399, 1880402

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A75131

Included Lab Sample IDs: 1880388, 1880389, 1880390, 1880397, 1880400

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

Reference Method: SM 5310 B-00

Run ID: A75160

Included Lab Sample IDs: 1880391, 1880392, 1880393, 1880398, 1880401

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.9	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A75184

Included Lab Sample IDs: 1880391, 1880392, 1880393, 1880398, 1880401

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

Reference Method: SM 2320 B-97

Run ID: A75223

Included Lab Sample IDs: 1880388, 1880389, 1880390, 1880397, 1880400

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

Reference Method: SM 4500 F-C-97

Run ID: A75223

Included Lab Sample IDs: 1880388, 1880389, 1880390, 1880397, 1880400

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.5	P/P	90 - 110
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75234

Included Lab Sample IDs: 1880391, 1880392, 1880393, 1880398, 1880401

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75246

Included Lab Sample IDs: 1880391, 1880392, 1880393, 1880398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.3	95.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75250

Included Lab Sample IDs: 1880401

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A75257

Included Lab Sample IDs: 1880391, 1880392, 1880393, 1880398, 1880401

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	93.5	92.5	P/P	90 - 110
NO2NO3-N	97.5	96.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75326

Included Lab Sample IDs: 1880388, 1880389, 1880390, 1880397, 1880400

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	94.1	94.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A75361

Included Lab Sample IDs: 1880408, 1880409, 1880410, 1880411, 1880412

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	95 - 105
Calcium	101	102	P/P	90 - 110
Iron	101	99.9	P/P	90 - 110
Iron	102	101	P/P	95 - 105
Magnesium	102	101	P/P	90 - 110
Magnesium	102	102	P/P	95 - 105
Potassium	101	101	P/P	90 - 110
Potassium	102	101	P/P	95 - 105
Sodium	97.7	98.5	P/P	90 - 110
Sodium	98.3	97.7	P/P	95 - 105
Zinc	101	102	P/P	90 - 110
Zinc	102	101	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75396

Included Lab Sample IDs: 1880388, 1880389, 1880390, 1880397, 1880400

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	98.8	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75446

Included Lab Sample IDs: 1880408, 1880409, 1880410, 1880411, 1880412

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.8	95.7	P/P	90 - 110
Arsenic	99.1	96.8	P/P	90 - 110
Cadmium	95.9	93.7	P/P	90 - 110
Cadmium	96.1	95.9	P/P	90 - 110
Chromium	99.0	98.2	P/P	90 - 110
Chromium	99.7	99.0	P/P	90 - 110
Copper	101	98.3	P/P	90 - 110
Copper	98.3	96.7	P/P	90 - 110
Lead	96.2	95.7	P/P	90 - 110
Lead	97.7	96.2	P/P	90 - 110
Silver	97.0	95.8	P/P	90 - 110
Silver	98.7	97.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75478

Included Lab Sample IDs: 1880408, 1880409, 1880410, 1880411, 1880412

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	97.9	97.3	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				1.03	
EPA 200.7 Rev. 4.4	Calcium	101	97.7			2.95
	Iron	102	101 101			0.439
	Magnesium	105	102 104			1.55
	Potassium	99.5	98.2 99.6			1.27
	Sodium	100	99.7 101			0.830
	Zinc	100	97.8 97.8			0.0609
EPA 200.8 Rev. 5.4	Arsenic	100	98.4 98.8			0.338
	Cadmium	97.0	98.1 97.1			0.980
	Chromium	100	99.2 99.3			0.0350
	Copper	100	96.3 95.4			0.937
	Lead	98.9	97.7 98.4			0.724
	Nickel	91.1	93.7 94.0			0.353
	Silver	100	101 100			0.830
EPA 300.0 Rev. 2.1	Chloride	94.7	93.5 93.1		0.0537	
	Sulfate	103	101 104		3.67	
EPA 350.1 Rev. 2.0	Ammonia-N	101	102 99.8			1.18
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	94.4 93.2			1.01
	Kjeldahl Nitrogen	106	96.2 102			3.59
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	96.5 98.0			1.54
EPA 365.1 Rev. 2.0	Total-P	106	99.6 102			2.34

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 365.1 Rev. 2.0	Total-P	100	102	102			0.381
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	98.1	97.0			0.951
SM 2320 B-97	Total Alkalinity	103				0.0966	
SM 2540 C-97	TDS					3.14	
	TDS					2.56	
	TDS					3.10	
SM 4500 F-C-97	Fluoride	95.6	96.6	96.1			0.498
SM 5310 B-00	Organic Carbon	96.4	97.4	98.0			0.563

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1880388, 1880389, 1880390, 1880397, 1880400
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1880408, 1880409, 1880410, 1880411, 1880412
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1880408, 1880409, 1880410, 1880411, 1880412
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1880388, 1880389, 1880390, 1880397, 1880400
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1880388, 1880389, 1880390, 1880397, 1880400
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1880391, 1880392, 1880393, 1880398, 1880401
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1880391, 1880392, 1880393, 1880398, 1880401
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1880391, 1880392, 1880393, 1880398, 1880401
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1880391, 1880392, 1880393, 1880398, 1880401
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1880394, 1880395, 1880396, 1880399, 1880402
SM 2120 B / E31780	True Color measured at 450 nm	1880388, 1880389, 1880390, 1880397, 1880400
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1880388, 1880389, 1880390, 1880397, 1880400
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1880388, 1880389, 1880390, 1880397, 1880400
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1880388, 1880389, 1880390, 1880397, 1880400
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1880388, 1880389, 1880390, 1880397, 1880400
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1880391, 1880392, 1880393, 1880398, 1880401

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	03/15/2017			03/15/2017 16:15	Blanca Fach	1880388, 1880389, 1880390, 1880397, 1880400
EPA 200.7 Rev. 4.4	03/15/2017	03/20/2017	Elliott D. Healy	03/24/2017	Martin Acosta	1880408, 1880409, 1880410, 1880411, 1880412
EPA 200.8 Rev. 5.4	03/15/2017	03/20/2017	Elliott D. Healy	03/29/2017	Robert K Palmer	1880408, 1880409, 1880410, 1880411, 1880412
	03/15/2017	03/20/2017	Elliott D. Healy	03/30/2017	Betina Topolski	1880408, 1880409, 1880410, 1880411, 1880412
EPA 300.0 Rev. 2.1	03/15/2017			03/25/2017	Ping Hua	1880388, 1880389, 1880390, 1880397, 1880400
	03/15/2017			03/29/2017	Ping Hua	1880388, 1880389, 1880390, 1880397, 1880400
EPA 350.1 Rev. 2.0	03/15/2017			03/17/2017	Sofia Elnemr	1880391, 1880392, 1880393, 1880398, 1880401
EPA 351.2 Rev. 2.0	03/15/2017	03/20/2017	Adrian Shelby	03/21/2017	Joseph Suarez	1880391, 1880392, 1880393, 1880398
	03/15/2017	03/20/2017	Adrian Shelby	03/22/2017	Joseph Suarez	1880401
EPA 353.2 Rev. 2.0	03/15/2017			03/21/2017	Beverly Y. Sanders	1880391, 1880392, 1880393, 1880398, 1880401
EPA 365.1 Rev. 2.0	03/15/2017	03/20/2017	Vijayalakshmi Reddy	03/21/2017	Lipi Saha	1880391, 1880392, 1880393, 1880398, 1880401
EPA 365.1 Rev. 2.0 dissolved	03/15/2017			03/15/2017 15:34	Ping Hua	1880394
	03/15/2017			03/15/2017 15:52	Ping Hua	1880396
	03/15/2017			03/15/2017 15:58	Ping Hua	1880399, 1880402
	03/15/2017			03/15/2017 15:59	Ping Hua	1880395
SM 2120 B	03/15/2017			03/15/2017 15:41	Julie Michelle Frank	1880388, 1880389
	03/15/2017			03/15/2017 15:42	Julie Michelle Frank	1880390
	03/15/2017			03/15/2017 15:43	Julie Michelle Frank	1880397
	03/15/2017			03/15/2017 15:44	Julie Michelle Frank	1880400
SM 2320 B-97	03/15/2017			03/18/2017	Dale L. Simmons	1880388, 1880389, 1880390, 1880397, 1880400
SM 2540 C-97	03/15/2017			03/17/2017	Yijie Li	1880388, 1880389, 1880390, 1880397, 1880400
SM 2540 D-97	03/15/2017			03/17/2017	Yijie Li	1880388, 1880389, 1880390, 1880397, 1880400
SM 4500 F-C-97	03/15/2017			03/18/2017	Dale L. Simmons	1880388, 1880389, 1880390, 1880397, 1880400
SM 5310 B-00	03/15/2017			03/16/2017	Julie Michelle Frank	1880391, 1880392, 1880393, 1880398, 1880401