

Chemical Analysis Report

NW-DIST-2017-11-17-01

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

Event Description: **Baker Run West WBID 19 24C 50 27 91 35A 196 92**
Request ID: **RQ-2017-11-06-38**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 308
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 11-DEC-2017 15:30



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: BIG JUNIPER CREEK SOUTH OF INDIAN FORD ROAD ALONG A PATH **Collection Date/Time: 11/16/2017 14:40**

Field ID: G4NW0418

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947377	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P335563	
	EPA 300.0 Rev. 2.1	Chloride	2.8		mg Cl/L	P335684	
		Sulfate	0.65		mg SO4/L	P335686	
	SM 2120 B	Color (true)	24		PCU	P335549	
	SM 2320 B-97	Total Alkalinity	0.89	I	mg CaCO3/L	P335849	
	SM 2540 C-97	TDS	19	I	mg/L	P335833	
	SM 2540 D-97	TSS	2	I	mg/L	P335840	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P335852	
1947382	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P336254	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.082	I	mg N/L	P336126	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P335937	
	EPA 365.1 Rev. 2.0	Total-P	0.003	I	mg P/L	P335883	
	SM 5310 B-00	Organic Carbon	2.1		mg C/L	P336100	
1947387	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P335554	

Ref. Method and Comment:

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

Sample Location: OAK CREEK BELOW TOMMY STEEL RD.

Collection Date/Time: 11/16/2017 13:15

Field ID: G4NW0395

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947378	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P335563	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P335684	
		Sulfate	1.5		mg SO4/L	P335686	
	SM 2120 B	Color (true)	98		PCU	P335549	
	SM 2320 B-97	Total Alkalinity	3.2		mg CaCO3/L	P335849	
	SM 2540 C-97	TDS	35		mg/L	P335833	
	SM 2540 D-97	TSS	3	I	mg/L	P335840	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P335852	
1947383	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P336254	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P336126	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P335937	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P335883	
	SM 5310 B-00	Organic Carbon	5.1		mg C/L	P336100	
1947388	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P335554	

Ref. Method and Comment:

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

Sample Location: POND CREEK IN MCCLOUD BAY AT PIPELINE SUNBURST DRIVE

Collection Date/Time: 11/16/2017 10:45

Field ID: G4NW0351

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947379	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P335563	

Field ID: G4NW0351

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947379	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P335684	
		Sulfate	1.2		mg SO4/L	P335686	
	SM 2120 B	Color (true)	41		PCU	P335549	
	SM 2320 B-97	Total Alkalinity	4.6		mg CaCO3/L	P335850	
	SM 2540 C-97	TDS	21	I	mg/L	P335833	
	SM 2540 D-97	TSS	3	I	mg/L	P335840	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P335853	RPD
1947384	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P336254	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P336126	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.34		mg N/L	P335938	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P335883	
	SM 5310 B-00	Organic Carbon	3.5		mg C/L	P336100	
1947389	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011	Q	mg P/L	P335554	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample was reanalyzed out of holding time due to analytical difficulties.

Sample Location: BEECH TREE CREEK UNNAMED RD.

Collection Date/Time: 11/16/2017 11:30

Field ID: G4NW0330

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947380	EPA 180.1 Rev. 2.0	Turbidity	3.9		NTU	P335563	
	EPA 300.0 Rev. 2.1	Chloride	2.3		mg Cl/L	P335684	
		Sulfate	0.76		mg SO4/L	P335686	
	SM 2120 B	Color (true)	26		PCU	P335549	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P335850	
	SM 2540 C-97	TDS	15	U	mg/L	P335833	
	SM 2540 D-97	TSS	4	I	mg/L	P335840	
1947385	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P335853	RPD
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P336254	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P336126	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.038		mg N/L	P335938	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P335883	
1947390	SM 5310 B-00	Organic Carbon	2.0		mg C/L	P336100	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P335554	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: GREEN BRANCH UPSTREAM OF BUCK TYNER RD.

Collection Date/Time: 11/16/2017 12:25

Field ID: G4NW0207

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947381	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P335563	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P335684	

Field ID: G4NW0207

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947381	EPA 300.0 Rev. 2.1	Sulfate	0.44	I	mg SO4/L	P335686	
	SM 2120 B	Color (true)	46		PCU	P335549	
	SM 2320 B-97	Total Alkalinity	4.9		mg CaCO3/L	P335850	
	SM 2540 C-97	TDS	35		mg/L	P335833	
	SM 2540 D-97	TSS	2	I	mg/L	P335840	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P335853	RPD
1947386	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P336254	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.13	I	mg N/L	P336127	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P335938	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P335883	
	SM 5310 B-00	Organic Carbon	3.2		mg C/L	P336100	
1947391	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P335554	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

**Sample Location: BLACKWATER RIVER ABOVE BRYANT
 BRIDGE BOAT RAMP**

Collection Date/Time: 11/16/2017 14:10

Field ID: G4NW0413

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947374	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P335563	
	EPA 300.0 Rev. 2.1	Chloride	3.2		mg Cl/L	P335684	
		Sulfate	0.90		mg SO4/L	P335686	
		Color (true)	48	A	PCU	P335549	
	SM 2320 B-97	Total Alkalinity	0.93	I	mg CaCO3/L	P335849	
	SM 2540 C-97	TDS	27		mg/L	P335833	
	SM 2540 D-97	TSS	2	I	mg/L	P335840	
1947375	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P335852	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P336254	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P336052	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P335937	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P335883	
1947376	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P336100	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P335554	
1947419	EPA 200.7 Rev. 4.4	Calcium	0.79		mg/L	P335750	
		Iron	390		ug/L	P335750	
		Magnesium	0.60		mg/L	P335750	
		Potassium	0.34	I	mg/L	P335750	
		Sodium	1.8	I	mg/L	P335750	
		Zinc	5.0	U	ug/L	P335750	
	EPA 200.8 Rev. 5.4	Arsenic	0.18	I	ug/L	P335750	
		Cadmium	0.020	U	ug/L	P335750	
		Chromium	0.40	U	ug/L	P335750	
		Copper	0.20	U	ug/L	P335750	

Field ID: G4NW0413

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947419	EPA 200.8 Rev. 5.4	Lead	0.13	I	ug/L	P335750	
		Nickel	0.44	I	ug/L	P335750	
		Silver	0.010	U	ug/L	P335750	

Ref. Method and Comment:

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: P335563

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P335750

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: P335750

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: P335684

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P335686

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P336254

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336052

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336126

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336127

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335937

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335938

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335554

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

Reference Method: SM 2120 B
Batch ID: P335549

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P335849

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
 Batch ID: P335850

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
 Batch ID: P335833

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P335840

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P335852

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
 Batch ID: P335853

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P336100

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: P335750

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	104		P	85 - 115
Sodium	102		P	85 - 115
Zinc	97.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P335750

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P335750

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	105		P	85 - 115
Chromium	102		P	85 - 115
Copper	102		P	85 - 115
Lead	103		P	85 - 115
Nickel	104		P	85 - 115
Silver	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335686

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336254

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336126

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336127

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335938

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335554

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

Reference Method: SM 2320 B-97
Batch ID: P335849

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P335850

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

Reference Method: SM 4500 F-C-97
Batch ID: P335852

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P335853

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P336100

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P335750

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P335750

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947324	Calcium	100		P	80 - 120
1947324	Iron	99.9		P	80 - 120
1947324	Magnesium	99.4		P	80 - 120
1947324	Potassium	101		P	80 - 120
1947324	Sodium	98.8		P	80 - 120
1947324	Zinc	97.7		P	80 - 120
1947419	Calcium	98.4	98.8	P/P	80 - 120
1947419	Iron	97.5	97.8	P/P	80 - 120
1947419	Magnesium	103	102	P/P	80 - 120
1947419	Potassium	100	101	P/P	80 - 120
1947419	Sodium	97.3	97.4	P/P	80 - 120
1947419	Zinc	96.1	96.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P335750

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947324	Arsenic	105		P	80 - 120
1947324	Cadmium	107		P	80 - 120
1947324	Chromium	102		P	80 - 120
1947324	Copper	102		P	80 - 120
1947324	Lead	104		P	80 - 120
1947324	Nickel	104		P	80 - 120
1947324	Silver	106		P	80 - 120
1947419	Arsenic	106	108	P/P	80 - 120
1947419	Cadmium	107	109	P/P	80 - 120
1947419	Chromium	105	106	P/P	80 - 120
1947419	Copper	105	106	P/P	80 - 120
1947419	Lead	106	107	P/P	80 - 120
1947419	Nickel	106	106	P/P	80 - 120
1947419	Silver	108	108	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947161	Chloride	95.6		P	90 - 110
1947426	Chloride	93.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335686

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947161	Sulfate	96.3		P	90 - 110
1947426	Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336254

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947375	Ammonia-N	96.0	95.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947267	Kjeldahl Nitrogen	97.4	96.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336126

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947385	Kjeldahl Nitrogen	110	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947386	Kjeldahl Nitrogen	92.4	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947319	NO2NO3-N	105	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947384	NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947361	Total-P	96.6	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335554

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947390	O-Phosphate-P	96.7	96.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P335852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947514	Fluoride	98.2	98.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P336100

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947375	Organic Carbon	95.0	94.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P335563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947360	Turbidity	10.8	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P335750

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947419	Calcium	0.310	Spike	P	0 - 20
1947419	Iron	0.292	Spike	P	0 - 20
1947419	Magnesium	0.187	Spike	P	0 - 20
1947419	Potassium	0.261	Spike	P	0 - 20
1947419	Sodium	0.0790	Spike	P	0 - 20
1947419	Zinc	0.687	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P335750

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947419	Arsenic	1.60	Spike	P	0 - 20
1947419	Cadmium	1.41	Spike	P	0 - 20
1947419	Chromium	1.58	Spike	P	0 - 20
1947419	Copper	1.07	Spike	P	0 - 20
1947419	Lead	1.62	Spike	P	0 - 20
1947419	Nickel	0.0672	Spike	P	0 - 20
1947419	Silver	0.196	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947161	Chloride	0.489	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335686

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947161	Sulfate	0.618	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336254

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947375	Ammonia-N	0.503	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947267	Kjeldahl Nitrogen	0.420	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947385	Kjeldahl Nitrogen	5.91	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947386	Kjeldahl Nitrogen	5.63	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947319	NO2NO3-N	0.409	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947384	NO2NO3-N	0.547	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947361	Total-P	1.30	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335554

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947390	O-Phosphate-P	0.0989	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P335549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947374	Color (true)	0.0525	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
 Batch ID: P335849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947514	Total Alkalinity	0.0879	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
 Batch ID: P335850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947553	Total Alkalinity	0.418	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
 Batch ID: P335833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947497	TDS	4.03	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P335852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947514	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
 Batch ID: P335853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947553	Fluoride	11.5	Spike	F	0 - 3.0

Reference Method: SM 5310 B-00
 Batch ID: P336100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947375	Organic Carbon	0.577	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: EPA 300.0 Rev. 2.1
 Run ID: A80230
 Included Lab Sample IDs: 1947374, 1947377, 1947378, 1947379, 1947380, 1947381

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A80364

Included Lab Sample IDs: 1947374, 1947377, 1947378, 1947379, 1947380, 1947381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	104	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A80365

Included Lab Sample IDs: 1947376, 1947387, 1947388, 1947390, 1947391

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A80367

Included Lab Sample IDs: 1947374, 1947377, 1947378, 1947379, 1947380, 1947381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	101	P/P	95 - 105

Reference Method: SM 2320 B-97

Run ID: A80493

Included Lab Sample IDs: 1947374, 1947377, 1947378, 1947379, 1947380, 1947381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.8	P/P	90 - 110
Total Alkalinity	99.8	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A80493

Included Lab Sample IDs: 1947374, 1947377, 1947378, 1947379, 1947380, 1947381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	P/P	90 - 110
Fluoride	99.0	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A80499

Included Lab Sample IDs: 1947419

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	96.7	97.0	P/P	90 - 110
Iron	97.2	96.1	P/P	90 - 110
Magnesium	97.6	96.6	P/P	90 - 110
Potassium	98.6	98.4	P/P	90 - 110
Sodium	96.7	97.1	P/P	90 - 110
Zinc	99.4	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80537

Included Lab Sample IDs: 1947375, 1947382, 1947383, 1947384, 1947385, 1947386

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80537

Included Lab Sample IDs: 1947375, 1947382, 1947383, 1947384, 1947385, 1947386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A80548

Included Lab Sample IDs: 1947375, 1947382, 1947383, 1947384, 1947385, 1947386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	98.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A80570

Included Lab Sample IDs: 1947419

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	104	103	P/P	90 - 110
Cadmium	104	103	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Copper	105	105	P/P	90 - 110
Lead	104	103	P/P	90 - 110
Nickel	106	105	P/P	90 - 110
Silver	106	104	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A80598

Included Lab Sample IDs: 1947375, 1947382, 1947383, 1947384, 1947385, 1947386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.7	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A80611

Included Lab Sample IDs: 1947389

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A80615

Included Lab Sample IDs: 1947386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.7	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A80642

Included Lab Sample IDs: 1947382, 1947383, 1947384, 1947385

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	108	99.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A80655

Included Lab Sample IDs: 1947375, 1947382, 1947383, 1947384, 1947385, 1947386

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: EPA 351.2 Rev. 2.0

Run ID: A80668

Included Lab Sample IDs: 1947375

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	97.9	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						10.8	
EPA 200.7 Rev. 4.4	Calcium	103	100	98.4	98.8			0.310
	Iron	102	99.9	97.5	97.8			0.292
	Magnesium	106	99.4	103	102			0.187
	Potassium	104	101	100	101			0.261
	Sodium	102	98.8	97.3	97.4			0.0790
	Zinc	97.0	97.7	96.1	96.8			0.687
EPA 200.8 Rev. 5.4	Arsenic	104	105	106	108			1.60
	Cadmium	105	107	107	109			1.41
	Chromium	102	102	105	106			1.58
	Copper	102	102	105	106			1.07
	Lead	103	104	106	107			1.62
	Nickel	104	104	106	106			0.0672
	Silver	107	106	108	108			0.196
EPA 300.0 Rev. 2.1	Chloride	96.5	95.6	93.7			0.489	
	Sulfate	97.7	96.3	96.2			0.618	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	96.0	95.5				0.503
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.6	97.4	96.9				0.420
	Kjeldahl Nitrogen	98.6	110	104				5.91
	Kjeldahl Nitrogen	100	92.4	98.4				5.63
EPA 353.2 Rev. 2.0	NO2NO3-N	104	105	105				0.409
	NO2NO3-N	103	100					0.547
EPA 365.1 Rev. 2.0	Total-P	95.5	96.6	97.9				1.30
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	96.7	96.8				0.0989
SM 2120 B	Color (true)						0.0525	
SM 2320 B-97	Total Alkalinity	102					0.0879	
	Total Alkalinity	103					0.418	
SM 2540 C-97	TDS						4.03	
SM 4500 F-C-97	Fluoride	97.0	98.2	98.2				0.0
	Fluoride	97.5						11.5
SM 5310 B-00	Organic Carbon	95.0	95.0	94.4				0.577

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1947419
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1947419
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1947375, 1947382, 1947383, 1947384, 1947385, 1947386
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1947375, 1947382, 1947383, 1947384, 1947385, 1947386
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1947375, 1947382, 1947383, 1947384, 1947385, 1947386
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1947375, 1947382, 1947383, 1947384, 1947385, 1947386
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1947376, 1947387, 1947388, 1947389, 1947390, 1947391
SM 2120 B / E31780	True Color measured at 450 nm	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1947375, 1947382, 1947383, 1947384, 1947385, 1947386

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	11/17/2017			11/17/2017 16:59	Tanya Welborn	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
EPA 200.7 Rev. 4.4	11/17/2017	11/21/2017	Elliott D. Healy	11/22/2017	Martin Acosta	1947419
EPA 200.8 Rev. 5.4	11/17/2017	11/21/2017	Elliott D. Healy	11/27/2017	Nadine Brooks	1947419
EPA 300.0 Rev. 2.1	11/17/2017			11/17/2017	Irina Carbone	1947374, 1947377, 1947378, 1947379, 1947380
	11/17/2017			11/18/2017	Irina Carbone	1947381
EPA 350.1 Rev. 2.0	11/17/2017			12/01/2017	Sofia Elnemr	1947375, 1947382, 1947383, 1947384, 1947385, 1947386
EPA 351.2 Rev. 2.0	11/17/2017	11/29/2017	Adrian Shelby	12/01/2017	Tanya Welborn	1947375
	11/17/2017	11/30/2017	Adrian Shelby	11/30/2017	Joseph Suarez	1947386
	11/17/2017	11/30/2017	Adrian Shelby	12/01/2017	Joseph Suarez	1947382, 1947383, 1947384, 1947385
EPA 353.2 Rev. 2.0	11/17/2017			11/28/2017	Beverly Y. Sanders	1947375, 1947382, 1947383, 1947384, 1947385, 1947386
EPA 365.1 Rev. 2.0	11/17/2017	11/27/2017	Sima Feizi	11/28/2017	Lipi Saha	1947375, 1947382, 1947383, 1947384, 1947385, 1947386
EPA 365.1 Rev. 2.0 dissolved	11/17/2017			11/17/2017 14:54	Megan Treadwell	1947390
	11/17/2017			11/17/2017 15:05	Megan Treadwell	1947376
	11/17/2017			11/17/2017 15:06	Megan Treadwell	1947387
	11/17/2017			11/17/2017 15:07	Megan Treadwell	1947388
	11/17/2017			11/17/2017 15:09	Megan Treadwell	1947391
	11/17/2017			11/30/2017 14:14	Megan Treadwell	1947389
SM 2120 B	11/17/2017			11/17/2017 15:03	Tanya Welborn	1947374
	11/17/2017			11/17/2017 15:04	Tanya Welborn	1947377
	11/17/2017			11/17/2017 15:05	Tanya Welborn	1947378, 1947379
	11/17/2017			11/17/2017 15:06	Tanya Welborn	1947380
	11/17/2017			11/17/2017 15:07	Tanya Welborn	1947381
SM 2320 B-97	11/17/2017			11/22/2017	Dale L. Simmons	1947374, 1947377, 1947378
	11/17/2017			11/23/2017	Dale L. Simmons	1947379, 1947380, 1947381
SM 2540 C-97	11/17/2017			11/20/2017	Yijie Li	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
SM 2540 D-97	11/17/2017			11/20/2017	Yijie Li	1947374, 1947377, 1947378, 1947379, 1947380, 1947381
SM 4500 F-C-97	11/17/2017			11/22/2017	Dale L. Simmons	1947374, 1947377, 1947378
	11/17/2017			11/23/2017	Dale L. Simmons	1947379, 1947380, 1947381
SM 5310 B-00	11/17/2017			11/28/2017	Ping Hua	1947375, 1947382
	11/17/2017			11/29/2017	Ping Hua	1947383, 1947384, 1947385, 1947386