

Chemical Analysis Report

SE-DIST-2016-03-25-01

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

Event Description: **C-12 and the other fork**

Request ID: **RQ-2016-03-28-31**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

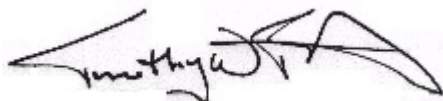
FL Dept. of Environmental Protection
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Fort Pierce, FL 34945
Attn: Jordan Skaggs

For additional information please contact

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Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 14-APR-2016 11:15

A handwritten signature in black ink, appearing to read 'Timothy W. 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 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: NEW RIVER (NORTH FORK) @ NW 27TH AVE Collection Date/Time: 03/24/2016 11:35

Field ID: G4SE0085_03242016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1783557	EPA 180.1 Rev. 2.0	Turbidity	3.8	A	NTU	P301069	
	SM 2320 B-97	Total Alkalinity	220		mg CaCO3/L	P301476	
	SM 2540 D-97	TSS	11		mg/L	P301472	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P301481	
1783559	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P301369	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P301587	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P301494	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P301397	
	SM 5310 B-00	Organic Carbon	8.4		mg C/L	P301377	
1783561	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P301075	
1783587	EPA 200.7 Rev. 4.4	Iron	150		ug/L	P301306	
		Zinc	5.9	I	ug/L	P301306	
	EPA 200.8 Rev. 5.4	Arsenic	2.31		ug/L	P301306	
		Cadmium	0.020	U	ug/L	P301306	
		Chromium	0.42		ug/L	P301306	
		Copper	1.97		ug/L	P301306	
		Lead	1.02		ug/L	P301306	
		Nickel	1.36		ug/L	P301306	
		Silver	0.0089	I	ug/L	P301306	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: NEW RIVER (NORTH FORK) SITE 64 Collection Date/Time: 03/24/2016 11:55

Field ID: G4SEB064_03242016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1783558	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P301069	
	SM 2320 B-97	Total Alkalinity	218		mg CaCO3/L	P301476	
	SM 2540 D-97	TSS	8	I	mg/L	P301473	
	SM 4500 F-C-97	Fluoride	0.22		mg F/L	P301481	
1783560	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P301369	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P301587	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P301494	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P301397	
	SM 5310 B-00	Organic Carbon	9.9		mg C/L	P301424	
1783562	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017		mg P/L	P301075	
1783588	EPA 200.7 Rev. 4.4	Iron	140		ug/L	P301306	
		Zinc	11	I	ug/L	P301306	
	EPA 200.8 Rev. 5.4	Arsenic	2.14		ug/L	P301306	
		Cadmium	0.022	I	ug/L	P301306	
		Chromium	0.50		ug/L	P301306	
		Copper	2.78		ug/L	P301306	
		Lead	1.13		ug/L	P301306	

Field ID: G4SEB064_03242016

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1783588	EPA 200.8 Rev. 5.4	Nickel	0.64		ug/L	P301306	
		Silver	0.019	I	ug/L	P301306	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: C-12 PLANTATION CANAL @ 441 AND
 SUNRISE

Collection Date/Time: 03/24/2016 12:15

Field ID: G4SEB121_03242016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1783551	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P301068	
	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P301316	
		Sulfate	7.7		mg SO4/L	P301317	
	SM 2120 B	Color (true)	20		PCU	P301077	
	SM 2320 B-97	Total Alkalinity	76		mg CaCO3/L	P301476	
	SM 2540 C-97	TDS	129		mg/L	P301399	
	SM 2540 D-97	TSS	2	U	mg/L	P301471	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P301481	
1783553	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P301369	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P301587	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P301494	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P301397	
	SM 5310 B-00	Organic Carbon	6.4		mg C/L	P301377	
1783555	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301071	
1783585	EPA 200.7 Rev. 4.4	Calcium	30.7		mg/L	P301305	
		Iron	30	U	ug/L	P301305	
		Magnesium	1.94		mg/L	P301305	
		Potassium	0.47	I	mg/L	P301305	
		Sodium	13.7		mg/L	P301305	
		Zinc	5.0	U	ug/L	P301305	
	EPA 200.8 Rev. 5.4	Arsenic	0.76		ug/L	P301305	
		Cadmium	0.020	U	ug/L	P301305	
		Chromium	0.14	I	ug/L	P301305	
		Copper	1.96		ug/L	P301305	
		Lead	0.12	I	ug/L	P301305	
		Nickel	0.36		ug/L	P301305	
		Silver	0.0050	U	ug/L	P301305	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: The calcium matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.

Sample Location: C-12 NW 47TH AVE AND NW 9TH DRIVE @ C12 Collection Date/Time: 03/24/2016 12:40

Field ID: G4SEB128_03242016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Field ID: G4SEB128_03242016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1783552	EPA 180.1 Rev. 2.0	Turbidity	0.65		NTU	P301068	
	EPA 300.0 Rev. 2.1	Chloride	38		mg Cl/L	P301316	
		Sulfate	13		mg SO4/L	P301317	
	SM 2120 B	Color (true)	26		PCU	P301077	
	SM 2320 B-97	Total Alkalinity	119		mg CaCO3/L	P301476	
	SM 2540 C-97	TDS	214	A	mg/L	P301399	
	SM 2540 D-97	TSS	2	I	mg/L	P301471	
	SM 4500 F-C-97	Fluoride	0.18		mg F/L	P301481	
1783554	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P301369	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P301587	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P301494	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P301397	
	SM 5310 B-00	Organic Carbon	8.2		mg C/L	P301377	
1783556	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301071	
1783586	EPA 200.7 Rev. 4.4	Calcium	46.6		mg/L	P301305	
		Iron	30	U	ug/L	P301305	
		Magnesium	3.96		mg/L	P301305	
		Potassium	1.2	I	mg/L	P301305	
		Sodium	23.8		mg/L	P301305	
		Zinc	5.0	U	ug/L	P301305	
	EPA 200.8 Rev. 5.4	Arsenic	0.93		ug/L	P301305	
		Cadmium	0.020	U	ug/L	P301305	
		Chromium	0.16	I	ug/L	P301305	
		Copper	2.46		ug/L	P301305	
		Lead	0.067	I	ug/L	P301305	
		Nickel	0.34		ug/L	P301305	
		Silver	0.0050	U	ug/L	P301305	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: The calcium matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P301068

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P301069

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: P301305

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 200.7 Rev. 4.4
Batch ID: P301306

Component	Result	Code	Units
Iron	30	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301305

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301306

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301316

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301317

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301369

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301587

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301494

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301397

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301071

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301075

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

Reference Method: SM 2120 B
Batch ID: P301077

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P301476

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

Reference Method: SM 2540 C-97
Batch ID: P301399

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P301471

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P301472

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P301473

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P301481

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P301377

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

Reference Method: SM 5310 B-00
Batch ID: P301424

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: P301305

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	103		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	99.4		P	85 - 115
Sodium	102		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P301306

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P301306

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301305

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.2		P	85 - 115
Cadmium	93.1		P	85 - 115
Chromium	97.6		P	85 - 115
Copper	89.8		P	85 - 115
Lead	89.6		P	85 - 115
Nickel	92.5		P	85 - 115
Silver	93.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301306

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.6		P	85 - 115
Cadmium	97.9		P	85 - 115
Chromium	98.7		P	85 - 115
Copper	95.8		P	85 - 115
Lead	93.2		P	85 - 115
Nickel	98.5		P	85 - 115
Silver	97.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301316

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301317

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301369

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301587

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.6		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301494

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301397

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301071

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301075

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

Reference Method: SM 2320 B-97
Batch ID: P301476

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

Reference Method: SM 4500 F-C-97
Batch ID: P301481

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.6		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P301377

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.7		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P301424

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P301305

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: P301305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783060	Calcium	101		P	80 - 120
1783060	Iron	100		P	80 - 120
1783060	Magnesium	102		P	80 - 120
1783060	Potassium	98.1		P	80 - 120
1783060	Sodium	99.5		P	80 - 120
1783060	Zinc	98.4		P	80 - 120
1783784	Iron	103	101	P/P	80 - 120
1783784	Magnesium	101		P	80 - 120
1783784	Potassium	99.3	96.3	P/P	80 - 120
1783784	Sodium	99.9		P	80 - 120
1783784	Zinc	99.4	99.2	P/P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P301306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783587	Iron	106	107	P/P	70 - 130
1783587	Zinc	103	105	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783060	Arsenic	95.6		P	80 - 120
1783060	Cadmium	96.2		P	80 - 120
1783060	Chromium	98.9		P	80 - 120
1783060	Copper	89.4		P	80 - 120
1783060	Lead	90.0		P	80 - 120
1783060	Nickel	91.6		P	80 - 120
1783060	Silver	94.1		P	80 - 120
1783784	Arsenic	95.0	96.8	P/P	80 - 120
1783784	Cadmium	94.4	95.6	P/P	80 - 120
1783784	Chromium	95.1	95.9	P/P	80 - 120
1783784	Copper	88.8	88.5	P/P	80 - 120
1783784	Lead	89.9	90.9	P/P	80 - 120
1783784	Nickel	89.7	90.6	P/P	80 - 120
1783784	Silver	92.0	92.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783587	Arsenic	101	102	P/P	70 - 130
1783587	Cadmium	97.8	99.0	P/P	70 - 130
1783587	Chromium	94.4	95.6	P/P	70 - 130
1783587	Copper	93.4	94.4	P/P	70 - 130
1783587	Lead	94.9	95.7	P/P	70 - 130
1783587	Nickel	92.7	92.3	P/P	70 - 130
1783587	Silver	95.8	97.0	P/P	70 - 130

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783141	Chloride	99.4		P	90 - 110
1783252	Chloride	96.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301317

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783141	Sulfate	96.8		P	90 - 110
1783252	Sulfate	94.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301587

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783553	Kjeldahl Nitrogen	102	93.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301494

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783545	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301397

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783546	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783503	O-Phosphate-P	98.8	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783561	O-Phosphate-P	98.6	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P301481

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783590	Fluoride	98.8	101	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P301377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783206	Organic Carbon	91.8	92.2	P/P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P301424

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1783564	Organic Carbon	92.2	93.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P301068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783523	Turbidity	7.23	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P301069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783557	Turbidity	4.46	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P301305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783784	Calcium	0.713	Spike	P	0 - 20
1783784	Iron	1.57	Spike	P	0 - 20
1783784	Magnesium	1.60	Spike	P	0 - 20
1783784	Potassium	2.21	Spike	P	0 - 20
1783784	Sodium	2.02	Spike	P	0 - 20
1783784	Zinc	0.287	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P301306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783587	Iron	0.931	Spike	P	0 - 20
1783587	Zinc	1.55	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783784	Arsenic	1.83	Spike	P	0 - 20
1783784	Cadmium	1.26	Spike	P	0 - 20
1783784	Chromium	0.790	Spike	P	0 - 20
1783784	Copper	0.369	Spike	P	0 - 20
1783784	Lead	1.10	Spike	P	0 - 20
1783784	Nickel	0.948	Spike	P	0 - 20
1783784	Silver	0.878	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P301306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783587	Arsenic	1.10	Spike	P	0 - 20
1783587	Cadmium	1.25	Spike	P	0 - 20
1783587	Chromium	1.23	Spike	P	0 - 20
1783587	Copper	0.910	Spike	P	0 - 20
1783587	Lead	0.735	Spike	P	0 - 20
1783587	Nickel	0.406	Spike	P	0 - 20
1783587	Silver	1.28	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783141	Chloride	0.00676	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301317

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783141	Sulfate	2.86	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783374	Ammonia-N	1.36	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783553	Kjeldahl Nitrogen	6.14	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301494

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783545	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783546	Total-P	1.90	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783503	O-Phosphate-P	0.229	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783561	O-Phosphate-P	1.13	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P301077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783539	Color (true)	0.160	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P301476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783590	Total Alkalinity	0.297	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P301399

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783552	TDS	3.74	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P301481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783590	Fluoride	1.46	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P301377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783206	Organic Carbon	0.287	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P301424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1783564	Organic Carbon	0.871	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: A68445

Included Lab Sample IDs: 1783551, 1783552, 1783557, 1783558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A68446

Included Lab Sample IDs: 1783555, 1783556, 1783561, 1783562

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	99.7	P/P	90 - 110
O-Phosphate-P	99.0	99.3	P/P	90 - 110
O-Phosphate-P	99.3	99.2	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A68449

Included Lab Sample IDs: 1783551, 1783552

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.4	97.0	P/P	90 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A68546

Included Lab Sample IDs: 1783551, 1783552

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Sulfate	98.2	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A68562

Included Lab Sample IDs: 1783553, 1783554, 1783559, 1783560

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

Reference Method: SM 5310 B-00

Run ID: A68565

Included Lab Sample IDs: 1783553, 1783554, 1783559

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.0	94.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A68578

Included Lab Sample IDs: 1783585, 1783586

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.1	96.6	P/P	90 - 110
Cadmium	96.9	94.6	P/P	90 - 110
Chromium	99.7	97.5	P/P	90 - 110
Copper	94.3	94.6	P/P	90 - 110
Lead	93.0	92.8	P/P	90 - 110
Nickel	95.0	94.7	P/P	90 - 110
Silver	93.7	92.5	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A68589

Included Lab Sample IDs: 1783560

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.2	94.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A68601

Included Lab Sample IDs: 1783585, 1783586, 1783587, 1783588

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.8	100	P/P	90 - 110
Iron	100	101	P/P	90 - 110
Iron	99.9	100	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	97.1	98.0	P/P	90 - 110
Sodium	96.4	97.5	P/P	90 - 110
Zinc	100	102	P/P	90 - 110
Zinc	99.6	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A68607

Included Lab Sample IDs: 1783551, 1783552, 1783557, 1783558

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: A68607

Included Lab Sample IDs: 1783551, 1783552, 1783557, 1783558

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A68614

Included Lab Sample IDs: 1783553, 1783554, 1783559, 1783560

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A68661
Included Lab Sample IDs: 1783559, 1783560

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A68686
Included Lab Sample IDs: 1783553, 1783554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A68701
Included Lab Sample IDs: 1783553, 1783554, 1783559, 1783560

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	95.7	P/P	90 - 110
Kjeldahl Nitrogen	94.2	102	P/P	90 - 110
Kjeldahl Nitrogen	95.7	95.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A68721
Included Lab Sample IDs: 1783587, 1783588

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.9	98.8	P/P	90 - 110
Cadmium	98.5	98.6	P/P	90 - 110
Chromium	99.2	99.2	P/P	90 - 110
Copper	97.1	98.1	P/P	90 - 110
Lead	96.1	97.1	P/P	90 - 110
Nickel	97.4	98.9	P/P	90 - 110
Silver	96.4	96.8	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			Precision	
			LCS			SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					7.23	
	Turbidity					4.46	
EPA 200.7 Rev. 4.4	Calcium	104		101			0.713
	Iron	103		100	103	101	1.57
	Iron	104		106	107		0.931
	Magnesium	103		102	101		1.60
	Potassium	99.4		98.1	99.3	96.3	2.21
	Sodium	102		99.5	99.9		2.02
	Zinc	101		98.4	99.4	99.2	0.287
	Zinc	102		103	105		1.55

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Arsenic	95.2	95.6	95.0	96.8		1.83
	Arsenic	98.6	101	102			1.10
	Cadmium	93.1	96.2	94.4	95.6		1.26
	Cadmium	97.9	97.8	99.0			1.25
	Chromium	97.6	98.9	95.1	95.9		0.790
	Chromium	98.7	94.4	95.6			1.23
	Copper	89.8	89.4	88.8	88.5		0.369
	Copper	95.8	93.4	94.4			0.910
	Lead	89.6	90.0	89.9	90.9		1.10
	Lead	93.2	94.9	95.7			0.735
	Nickel	92.5	91.6	89.7	90.6		0.948
	Nickel	98.5	92.7	92.3			0.406
	Silver	93.4	94.1	92.0	92.8		0.878
	Silver	97.3	95.8	97.0			1.28
	Chloride	99.6	99.4	96.9		0.0067	
	Sulfate	97.6	96.8	94.3		2.86	
EPA 300.0 Rev. 2.1	Ammonia-N	99.5					1.36
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.6	102	93.4			6.14
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	102			0.489
EPA 365.1 Rev. 2.0	Total-P	102	103	105			1.90
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.8	98.5			0.229
	O-Phosphate-P	103	98.6	99.8			1.13
SM 2120 B	Color (true)					0.160	
SM 2320 B-97	Total Alkalinity	103				0.297	
SM 2540 C-97	TDS					3.74	
SM 4500 F-C-97	Fluoride	96.6	98.8	101			1.46
SM 5310 B-00	Organic Carbon	97.7	91.8	92.2			0.287
	Organic Carbon	100	92.2	93.7			0.871

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1783551, 1783552, 1783557, 1783558
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1783585, 1783586, 1783587, 1783588
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1783585, 1783586, 1783587, 1783588
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1783551, 1783552
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1783551, 1783552
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1783553, 1783554, 1783559, 1783560
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1783553, 1783554, 1783559, 1783560
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1783553, 1783554, 1783559, 1783560
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1783553, 1783554, 1783559, 1783560
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1783555, 1783556, 1783561, 1783562
SM 2120 B / E31780	True Color measured at 450 nm	1783551, 1783552
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1783551, 1783552, 1783557, 1783558
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1783551, 1783552

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1783551, 1783552, 1783557, 1783558
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1783551, 1783552, 1783557, 1783558
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1783553, 1783554, 1783559, 1783560

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	03/25/2016			03/25/2016 14:31	Sima Feizi	1783551, 1783552, 1783557, 1783558
EPA 200.7 Rev. 4.4	03/25/2016	03/30/2016	Elliott D. Healy	04/01/2016	Joshua Ayres	1783585, 1783586
	03/25/2016	03/30/2016	Elliott D. Healy	04/02/2016	Joshua Ayres	1783587, 1783588
EPA 200.8 Rev. 5.4	03/25/2016	03/30/2016	Elliott D. Healy	04/01/2016	Charles J. Peterson	1783585, 1783586
	03/25/2016	03/30/2016	Elliott D. Healy	04/07/2016	Charles J. Peterson	1783587, 1783588
EPA 300.0 Rev. 2.1	03/25/2016			03/31/2016	Ping Hua	1783551, 1783552
EPA 350.1 Rev. 2.0	03/25/2016			03/31/2016	Diana M. Turner	1783553, 1783554, 1783559, 1783560
EPA 351.2 Rev. 2.0	03/25/2016	04/05/2016	Sofia Elnemr	04/06/2016	Virginia P. Brown	1783553, 1783554, 1783559, 1783560
EPA 353.2 Rev. 2.0	03/25/2016			04/01/2016	Diana M. Turner	1783553, 1783554, 1783559, 1783560
EPA 365.1 Rev. 2.0	03/25/2016	04/01/2016	Christopher Armour	04/05/2016	Rochelle Y Jackson	1783559, 1783560
	03/25/2016	04/01/2016	Christopher Armour	04/06/2016	Rochelle Y Jackson	1783553, 1783554
EPA 365.1 Rev. 2.0 dissolved	03/25/2016			03/25/2016 15:01	Ping Hua	1783561
	03/25/2016			03/25/2016 15:07	Ping Hua	1783555
	03/25/2016			03/25/2016 15:12	Ping Hua	1783556
	03/25/2016			03/25/2016 15:42	Ping Hua	1783562
SM 2120 B	03/25/2016			03/25/2016 16:22	Rochelle Y Jackson	1783551
	03/25/2016			03/25/2016 16:23	Rochelle Y Jackson	1783552
SM 2320 B-97	03/25/2016			03/31/2016	Dale L. Simmons	1783551, 1783552, 1783557, 1783558
SM 2540 C-97	03/25/2016			03/29/2016	Yijie Li	1783551, 1783552
SM 2540 D-97	03/25/2016			03/29/2016	Yijie Li	1783551, 1783552, 1783557, 1783558
SM 4500 F-C-97	03/25/2016			03/31/2016	Dale L. Simmons	1783551, 1783552, 1783557, 1783558
SM 5310 B-00	03/25/2016			03/31/2016	Sofia Elnemr	1783553, 1783554, 1783559, 1783560