

Chemical Analysis Report

NE-DIST-2022-08-17-02

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

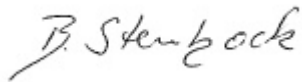
Event Description: **Nassau North 2**
Request ID: **RQ-2022-07-18-34**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 08-SEP-2022 13:27



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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Creek draining former Hampton lake 100m above rd

Collection Date/Time: 08/16/2022 10:30

Field ID: G4NE0292

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2350066	EPA 200.7 Rev. 4.4	Calcium	4.76		mg/L	P418358	
		Iron	1.33E+03		ug/L	P418358	
		Magnesium	1.01		mg/L	P418358	
		Potassium	0.61	I	mg/L	P418358	
		Sodium	5.7		mg/L	P418358	
		Strontium	18.7		ug/L	P418358	
		Tin	3.0	U	ug/L	P418358	
		Titanium	1.3	I	ug/L	P418358	
		Vanadium	2.0	U	ug/L	P418358	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P418358	
		Aluminum	329		ug/L	P418358	
		Antimony	0.050	U	ug/L	P418358	
		Arsenic	0.59		ug/L	P418358	
		Barium	18.7		ug/L	P418358	
		Beryllium	0.027	I	ug/L	P418358	
		Boron	19.1		ug/L	P418358	
		Cadmium	0.020	U	ug/L	P418358	
		Chromium	0.52	I	ug/L	P418358	
		Cobalt	0.129		ug/L	P418358	
		Copper	0.40	U	ug/L	P418358	
		Lead	0.61		ug/L	P418358	
		Manganese	10.0		ug/L	P418358	
		Molybdenum	0.15	U	ug/L	P418358	
		Nickel	0.50	U	ug/L	P418358	
		Selenium	0.20	U	ug/L	P418358	
		Silver	0.010	U	ug/L	P418358	
		Thallium	0.10	U	ug/L	P418358	
		Hardness	16.1		mg/L	P418358	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/24/2022.

Sample Location: PIGEON CREEK AT US 1

Collection Date/Time: 08/16/2022 10:55

Field ID: 19010099

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2350053	DEP SOP: NU-094-1	Color (true)	230		PCU	P418272	
	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P418266	
	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P418867	
		Sulfate	1.8		mg SO4/L	P418870	
	SM 2320 B-2011	Total Alkalinity	4.4		mg CaCO3/L	P418391	
	SM 2540 C-2011	TDS	76		mg/L	P418646	
	SM 2540 D-2011	TSS	2	I	mg/L	P418606	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P418401	
2350054	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P418492	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P418448	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.088		mg N/L	P418529	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P418369	
	SM 5310 B-2011	Organic Carbon	18		mg C/L	P418470	
2350061	EPA 200.7 Rev. 4.4	Calcium	4.48		mg/L	P418358	
		Iron	1.25E+03		ug/L	P418358	
		Magnesium	0.95		mg/L	P418358	
		Potassium	0.68	I	mg/L	P418358	
		Sodium	5.5		mg/L	P418358	
		Strontium	17.7		ug/L	P418358	
		Tin	3.0	U	ug/L	P418358	
		Titanium	2.0	I	ug/L	P418358	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P418358	
		Zinc	5.0	U	ug/L	P418358	
		Aluminum	310		ug/L	P418358	
		Antimony	0.050	U	ug/L	P418358	
		Arsenic	0.53		ug/L	P418358	
		Barium	17.8		ug/L	P418358	
		Beryllium	0.023	I	ug/L	P418358	
		Boron	19.4		ug/L	P418358	
		Cadmium	0.020	U	ug/L	P418358	
		Chromium	0.46	I	ug/L	P418358	
		Cobalt	0.094		ug/L	P418358	
		Copper	0.40	U	ug/L	P418358	
		Lead	0.49		ug/L	P418358	
		Manganese	7.52		ug/L	P418358	
		Molybdenum	0.15	U	ug/L	P418358	
		Nickel	0.50	U	ug/L	P418358	
		Selenium	0.20	U	ug/L	P418358	
		Silver	0.010	U	ug/L	P418358	
		Thallium	0.10	U	ug/L	P418358	
	SM 2340 B-2011	Hardness	15.1		mg/L	P418358	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: PIGEON CREEK @ ANDREWS RD

Collection Date/Time: 08/16/2022 11:25

Field ID: 19010098

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2350062	EPA 200.7 Rev. 4.4	Calcium	2.12		mg/L	P418358	
		Iron	3.13E+03		ug/L	P418358	
		Magnesium	0.70		mg/L	P418358	
		Potassium	0.41	I	mg/L	P418358	
		Sodium	5.3		mg/L	P418358	
		Strontium	12.1		ug/L	P418358	
		Tin	3.0	U	ug/L	P418358	
		Titanium	1.1	I	ug/L	P418358	
		Vanadium	2.0	U	ug/L	P418358	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P418358	
		Aluminum	488		ug/L	P418358	
		Antimony	0.050	U	ug/L	P418358	
		Arsenic	0.85		ug/L	P418358	
		Barium	13.3		ug/L	P418358	
		Beryllium	0.026	I	ug/L	P418358	
		Boron	18.0		ug/L	P418358	
		Cadmium	0.020	U	ug/L	P418358	
		Chromium	0.59	I	ug/L	P418358	
		Cobalt	0.226		ug/L	P418358	
		Copper	0.40	U	ug/L	P418358	
		Lead	0.75		ug/L	P418358	
		Manganese	10.7		ug/L	P418358	
		Molybdenum	0.15	U	ug/L	P418358	
		Nickel	0.67	I	ug/L	P418358	
		Selenium	0.20	U	ug/L	P418358	
		Silver	0.010	U	ug/L	P418358	
		Thallium	0.10	U	ug/L	P418358	
	SM 2340 B-2011	Hardness	8.2		mg/L	P418358	

Ref. Method and Comment:
 EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/24/2022.

Sample Location: Mills CR @ CR 108

Collection Date/Time: 08/16/2022 12:05

Field ID: 19010096

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2350063	EPA 200.7 Rev. 4.4	Calcium	3.52		mg/L	P418358	
		Iron	2.32E+03		ug/L	P418358	
		Magnesium	0.93		mg/L	P418358	
		Potassium	0.72	I	mg/L	P418358	
		Sodium	7.3		mg/L	P418358	
		Strontium	17.5		ug/L	P418358	
		Tin	3.0	U	ug/L	P418358	
		Titanium	1.3	I	ug/L	P418358	
		Vanadium	2.0	U	ug/L	P418358	
		Zinc	5.0	U	ug/L	P418358	
	EPA 200.8 Rev. 5.4	Aluminum	509		ug/L	P418358	
		Antimony	0.050	U	ug/L	P418358	
		Arsenic	0.58		ug/L	P418358	
		Barium	21.8		ug/L	P418358	
		Beryllium	0.036	I	ug/L	P418358	
		Boron	16.9		ug/L	P418358	
		Cadmium	0.020	U	ug/L	P418358	
		Chromium	0.68	I	ug/L	P418358	
		Cobalt	0.279		ug/L	P418358	
		Copper	0.40	U	ug/L	P418358	
		Lead	0.63		ug/L	P418358	
		Manganese	11.1		ug/L	P418358	
		Molybdenum	0.15	U	ug/L	P418358	
		Nickel	0.69	I	ug/L	P418358	
		Selenium	0.20	U	ug/L	P418358	
		Silver	0.010	U	ug/L	P418358	
		Thallium	0.10	U	ug/L	P418358	
	SM 2340 B-2011	Hardness	12.6		mg/L	P418358	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/24/2022.

Sample Location: Little St Marys River @ SR 115A

Collection Date/Time: 08/16/2022 12:45

Field ID: 19010032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2350064	EPA 200.7 Rev. 4.4	Calcium	12.6		mg/L	P418358	
		Iron	1.08E+03		ug/L	P418358	
		Magnesium	2.90		mg/L	P418358	
		Potassium	1.2		mg/L	P418358	
		Sodium	10.8		mg/L	P418358	
		Strontium	52.6		ug/L	P418358	
		Tin	3.0	U	ug/L	P418358	
		Titanium	1.3	I	ug/L	P418358	
		Vanadium	2.0	U	ug/L	P418358	
		Zinc	5.0	U	ug/L	P418358	
	EPA 200.8 Rev. 5.4	Aluminum	311		ug/L	P418358	
		Antimony	0.050	U	ug/L	P418358	
		Arsenic	0.61		ug/L	P418358	
		Barium	27.9		ug/L	P418358	
		Beryllium	0.030	I	ug/L	P418358	
		Boron	33.8		ug/L	P418358	
		Cadmium	0.020	U	ug/L	P418358	
		Chromium	0.71	I	ug/L	P418358	
		Cobalt	0.221		ug/L	P418358	
		Copper	0.40	U	ug/L	P418358	
		Lead	0.50		ug/L	P418358	
		Manganese	30.8		ug/L	P418358	
		Molybdenum	0.15	U	ug/L	P418358	
		Nickel	0.50	U	ug/L	P418358	
		Selenium	0.20	U	ug/L	P418358	
		Silver	0.010	U	ug/L	P418358	
		Thallium	0.10	U	ug/L	P418358	
	SM 2340 B-2011	Hardness	43.5		mg/L	P418358	

Sample Location: MILLS CREEK AT US 301/US1

Collection Date/Time: 08/16/2022 13:10

Field ID: 19020048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2350065	EPA 200.7 Rev. 4.4	Calcium	4.62		mg/L	P418358	
		Iron	1.45E+03		ug/L	P418358	
		Magnesium	1.40		mg/L	P418358	
		Potassium	0.70	I	mg/L	P418358	
		Sodium	7.0		mg/L	P418358	
		Strontium	24.2		ug/L	P418358	
		Tin	3.0	U	ug/L	P418358	
		Titanium	0.88	I	ug/L	P418358	
		Vanadium	2.0	U	ug/L	P418358	
	EPA 200.8 Rev. 5.4	Zinc	10	I	ug/L	P418358	
		Aluminum	392		ug/L	P418358	
		Antimony	0.050	U	ug/L	P418358	
		Arsenic	0.52		ug/L	P418358	
		Barium	17.7		ug/L	P418358	
		Beryllium	0.033	I	ug/L	P418358	
		Boron	21.2		ug/L	P418358	
		Cadmium	0.020	U	ug/L	P418358	
		Chromium	0.75	I	ug/L	P418358	
		Cobalt	0.331		ug/L	P418358	
		Copper	1.15		ug/L	P418358	
		Lead	0.51		ug/L	P418358	
		Manganese	16.1		ug/L	P418358	
		Molybdenum	0.15	U	ug/L	P418358	
		Nickel	0.56	I	ug/L	P418358	
		Selenium	0.20	U	ug/L	P418358	
		Silver	0.010	U	ug/L	P418358	
		Thallium	0.10	U	ug/L	P418358	
	SM 2340 B-2011	Hardness	17.3		mg/L	P418358	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/24/2022.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P418272

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P418266

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P418358

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
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P418358

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418867

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418870

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418492

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418448

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418369

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

Reference Method: SM 2320 B-2011
Batch ID: P418391

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

Reference Method: SM 2540 C-2011
Batch ID: P418646

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P418606

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P418401

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P418470

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P418272

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P418266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.1		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P418358

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	105		P	85 - 115
Sodium	101		P	85 - 115
Strontium	105		P	85 - 115
Tin	108		P	85 - 115
Titanium	105		P	85 - 115
Vanadium	99.9		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P418358

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	98.1		P	85 - 115
Barium	103		P	85 - 115
Beryllium	95.4		P	85 - 115
Boron	104		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	105		P	85 - 115
Cobalt	92.0		P	85 - 115
Copper	91.0		P	85 - 115
Lead	96.1		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	98.2		P	85 - 115
Nickel	92.9		P	85 - 115
Selenium	98.5		P	85 - 115
Silver	99.4		P	85 - 115
Thallium	94.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418867

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418870

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418492

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418448

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418369

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P418391

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.9		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P418401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P418470

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P418358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349421	Calcium	105		P	80 - 120
2349421	Iron	101	109	P/P	80 - 120
2349421	Magnesium	102	108	P/P	80 - 120
2349421	Potassium	110	106	P/P	80 - 120
2349421	Sodium	105		P	80 - 120
2349421	Strontium	105	108	P/P	80 - 120
2349421	Tin	109	111	P/P	80 - 120
2349421	Titanium	104	106	P/P	80 - 120
2349421	Vanadium	99.9	102	P/P	80 - 120
2349421	Zinc	99.4	102	P/P	80 - 120
2349423	Calcium	102		P	80 - 120
2349423	Iron	105		P	80 - 120
2349423	Magnesium	105		P	80 - 120
2349423	Potassium	106		P	80 - 120
2349423	Sodium	105		P	80 - 120
2349423	Strontium	106		P	80 - 120
2349423	Tin	104		P	80 - 120
2349423	Titanium	103		P	80 - 120
2349423	Vanadium	100		P	80 - 120
2349423	Zinc	97.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P418358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349421	Aluminum	98.6	96.5	P/P	80 - 120
2349421	Antimony	101	99.8	P/P	80 - 120
2349421	Arsenic	97.1	95.5	P/P	80 - 120
2349421	Barium	101	99.9	P/P	80 - 120
2349421	Beryllium	94.8		P	80 - 120
2349421	Boron	99.7	100	P/P	80 - 120
2349421	Cadmium	102	102	P/P	80 - 120
2349421	Chromium	105	103	P/P	80 - 120
2349421	Cobalt	90.8	89.4	P/P	80 - 120
2349421	Copper	92.3	91.0	P/P	80 - 120
2349421	Lead	95.6	94.8	P/P	80 - 120
2349421	Manganese	99.4	98.0	P/P	80 - 120
2349421	Molybdenum	98.3	97.3	P/P	80 - 120
2349421	Nickel	92.0	90.4	P/P	80 - 120
2349421	Selenium	96.8	94.5	P/P	80 - 120
2349421	Silver	98.9	97.1	P/P	80 - 120
2349421	Thallium	95.2	96.1	P/P	80 - 120
2349423	Aluminum	97.1		P	80 - 120
2349423	Antimony	101		P	80 - 120
2349423	Arsenic	95.6		P	80 - 120
2349423	Barium	101		P	80 - 120
2349423	Beryllium	94.3	99.6	P/P	80 - 120
2349423	Boron	103		P	80 - 120
2349423	Cadmium	102		P	80 - 120
2349423	Chromium	105		P	80 - 120
2349423	Cobalt	90.3		P	80 - 120
2349423	Copper	87.3		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P418358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349423	Lead	95.1		P	80 - 120
2349423	Manganese	100		P	80 - 120
2349423	Molybdenum	97.2		P	80 - 120
2349423	Nickel	90.4		P	80 - 120
2349423	Selenium	96.6		P	80 - 120
2349423	Silver	98.3		P	80 - 120
2349423	Thallium	94.1		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349934	Chloride	96.7		P	90 - 110
2350213	Chloride	97.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418870

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349934	Sulfate	97.4		P	90 - 110
2350213	Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418492

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349935	Ammonia-N	99.4	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2350099	NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418369

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2350029	Total-P	107	107	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P418401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349634	Fluoride	100	99.2	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P418470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2349844	Organic Carbon	99.3	99.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P418272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2350028	Color (true)	10.3	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P418266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2350028	Turbidity	16.4	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P418358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349421	Calcium	0.379	Spike	P	0 - 20
2349421	Iron	6.70	Spike	P	0 - 20
2349421	Magnesium	3.87	Spike	P	0 - 20
2349421	Potassium	2.22	Spike	P	0 - 20
2349421	Sodium	4.07	Spike	P	0 - 20
2349421	Strontium	2.23	Spike	P	0 - 20
2349421	Tin	1.83	Spike	P	0 - 20
2349421	Titanium	2.16	Spike	P	0 - 20
2349421	Vanadium	2.13	Spike	P	0 - 20
2349421	Zinc	2.52	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P418358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349421	Aluminum	2.02	Spike	P	0 - 20
2349421	Antimony	1.52	Spike	P	0 - 20
2349421	Arsenic	1.55	Spike	P	0 - 20
2349421	Barium	0.647	Spike	P	0 - 20
2349421	Beryllium	3.14	Spike	P	0 - 20
2349421	Boron	0.398	Spike	P	0 - 20
2349421	Cadmium	0.118	Spike	P	0 - 20
2349421	Chromium	2.03	Spike	P	0 - 20
2349421	Cobalt	1.55	Spike	P	0 - 20
2349421	Copper	1.44	Spike	P	0 - 20
2349421	Lead	0.862	Spike	P	0 - 20
2349421	Manganese	0.857	Spike	P	0 - 20
2349421	Molybdenum	1.00	Spike	P	0 - 20
2349421	Nickel	1.86	Spike	P	0 - 20
2349421	Selenium	2.41	Spike	P	0 - 20
2349421	Silver	1.85	Spike	P	0 - 20
2349421	Thallium	0.876	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349934	Chloride	0.727	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418870

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349934	Sulfate	0.715	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349935	Ammonia-N	3.39	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349825	Kjeldahl Nitrogen	0.0836	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2350099	NO2NO3-N	0.509	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2350029	Total-P	0.384	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P418391

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349634	Total Alkalinity	0.781	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P418646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2350210	TDS	3.47	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P418401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349634	Fluoride	0.940	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P418470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2349844	Organic Carbon	0.0327	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A114165

Included Lab Sample IDs: 2350053

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

Reference Method: DEP SOP: NU-094-1

Run ID: A114167

Included Lab Sample IDs: 2350053

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.6	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A114212

Included Lab Sample IDs: 2350053

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	98.1	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A114212

Included Lab Sample IDs: 2350053

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A114225

Included Lab Sample IDs: 2350061, 2350062, 2350063, 2350064, 2350065, 2350066

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Iron	98.6	102	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Sodium	97.6	99.4	P/P	90 - 110
Strontium	101	101	P/P	90 - 110
Tin	100	99.8	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	99.0	99.0	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A114244

Included Lab Sample IDs: 2350054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.1	97.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114252

Included Lab Sample IDs: 2350054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114252

Included Lab Sample IDs: 2350054

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A114256

Included Lab Sample IDs: 2350061, 2350062, 2350063, 2350064, 2350065, 2350066

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.1	96.8	P/P	90 - 110
Antimony	97.6	97.2	P/P	90 - 110
Arsenic	97.0	97.0	P/P	90 - 110
Barium	96.9	96.7	P/P	90 - 110
Beryllium	93.6	95.6	P/P	90 - 110
Cadmium	105	105	P/P	90 - 110
Chromium	105	105	P/P	90 - 110
Cobalt	91.7	91.5	P/P	90 - 110
Copper	92.6	92.2	P/P	90 - 110
Lead	92.6	92.7	P/P	90 - 110
Manganese	101	101	P/P	90 - 110
Molybdenum	96.7	96.8	P/P	90 - 110
Nickel	92.1	91.4	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Silver	97.6	97.1	P/P	90 - 110
Thallium	98.6	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114268

Included Lab Sample IDs: 2350054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	97.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A114284

Included Lab Sample IDs: 2350061, 2350062, 2350063, 2350064, 2350065, 2350066

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	94.4	98.3	P/P	90 - 110
Boron	98.8	94.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114304

Included Lab Sample IDs: 2350054

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114314

Included Lab Sample IDs: 2350054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114314

Included Lab Sample IDs: 2350054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	97.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A114335

Included Lab Sample IDs: 2350053

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.6	98.4	P/P	90 - 110
Sulfate	99.3	99.1	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 SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	99.6				10.3	
EPA 180.1 Rev. 2.0	Turbidity	97.1				16.4	
EPA 200.7 Rev. 4.4	Calcium	103	105	102			0.379
	Iron	105	101	109	105		6.70
	Magnesium	106	102	108	105		3.87
	Potassium	105	110	106	106		2.22
	Sodium	101	105	105			4.07
	Strontium	105	105	108	106		2.23
	Tin	108	109	111	104		1.83
	Titanium	105	104	106	103		2.16
	Vanadium	99.9	99.9	102	100		2.13
	Zinc	100	99.4	102	97.9		2.52
EPA 200.8 Rev. 5.4	Aluminum	100	98.6	96.5	97.1		2.02
	Antimony	103	101	99.8	101		1.52
	Arsenic	98.1	97.1	95.5	95.6		1.55
	Barium	103	101	99.9	101		0.647
	Beryllium	95.4	99.6	94.8	94.3		3.14
	Boron	104	99.7	100	103		0.398
	Cadmium	103	102	102	102		0.118
	Chromium	105	105	103	105		2.03
	Cobalt	92.0	90.8	89.4	90.3		1.55
	Copper	91.0	92.3	91.0	87.3		1.44
	Lead	96.1	95.6	94.8	95.1		0.862
	Manganese	101	99.4	98.0	100		0.857
	Molybdenum	98.2	98.3	97.3	97.2		1.00
	Nickel	92.9	92.0	90.4	90.4		1.86
	Selenium	98.5	96.8	94.5	96.6		2.41
	Silver	99.4	98.9	97.1	98.3		1.85
	Thallium	94.9	95.2	96.1	94.1		0.876
EPA 300.0 Rev. 2.1	Chloride	98.0	96.7	97.0		0.727	
	Sulfate	98.6	97.4	96.2		0.715	
EPA 350.1 Rev. 2.0	Ammonia-N	100	99.4	104			3.39
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101					0.0836
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	98.5	98.0			0.509
EPA 365.1 Rev. 2.0	Total-P	108	107	107			0.384
SM 2320 B-2011	Total Alkalinity	98.9				0.781	
SM 2540 C-2011	TDS					3.47	
SM 4500-F- C-2011	Fluoride	101	100	99.2			0.940
SM 5310 B-2011	Organic Carbon	97.0	99.3	99.4			0.0327

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2350053
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2350053
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2350061, 2350062, 2350063, 2350064, 2350065, 2350066
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2350061, 2350062, 2350063, 2350064, 2350065, 2350066
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2350053
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2350053
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2350054
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2350054

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2350054
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2350054
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2350053
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2350061, 2350062, 2350063, 2350064, 2350065, 2350066
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2350053
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2350053
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2350053
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2350054

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	08/17/2022			08/17/2022 16:51	Anna M. Plaviak	2350053
EPA 180.1 Rev. 2.0	08/17/2022			08/17/2022 15:18	Khloe J Berg	2350053
EPA 200.7 Rev. 4.4	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/20/2022 11:01	McKinley C Carter	2350061
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/20/2022 11:09	McKinley C Carter	2350062
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/20/2022 11:17	McKinley C Carter	2350063
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/20/2022 11:25	McKinley C Carter	2350064
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/20/2022 11:33	McKinley C Carter	2350065
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/20/2022 11:40	McKinley C Carter	2350066
EPA 200.8 Rev. 5.4	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/22/2022 23:06	Emily M Philpot	2350061
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/22/2022 23:16	Emily M Philpot	2350062
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/22/2022 23:26	Emily M Philpot	2350063
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/22/2022 23:35	Emily M Philpot	2350064
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/22/2022 23:45	Emily M Philpot	2350065
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/22/2022 23:55	Emily M Philpot	2350066
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/23/2022 21:02	Megan Whitefoot	2350061
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/23/2022 21:11	Megan Whitefoot	2350062
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/23/2022 22:14	Megan Whitefoot	2350063
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/23/2022 22:23	Megan Whitefoot	2350064
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/23/2022 22:32	Megan Whitefoot	2350065
	08/17/2022	08/19/2022 10:10	Megan Whitefoot	08/23/2022 22:41	Megan Whitefoot	2350066
EPA 300.0 Rev. 2.1	08/17/2022			08/26/2022 19:32	Anna M. Plaviak	2350053
EPA 350.1 Rev. 2.0	08/17/2022			08/22/2022 16:29	Judith K. Clark	2350054
EPA 351.2 Rev. 2.0	08/17/2022	08/23/2022 16:31	Samantha L Bates	08/24/2022 17:14	Samantha L Bates	2350054
EPA 353.2 Rev. 2.0	08/17/2022			08/23/2022 10:36	Beverly Y. Sanders	2350054
EPA 365.1 Rev. 2.0	08/17/2022	08/23/2022 18:30	Simonne.V. Calhoun	08/24/2022 16:22	James L Waggeberby	2350054
SM 2320 B-2011	08/17/2022			08/19/2022 04:45	Adam P Silver	2350053
SM 2340 B-2011	08/17/2022			08/20/2022 11:01	McKinley C Carter	2350061
	08/17/2022			08/20/2022 11:09	McKinley C Carter	2350062
	08/17/2022			08/20/2022 11:17	McKinley C Carter	2350063
	08/17/2022			08/20/2022 11:25	McKinley C Carter	2350064
	08/17/2022			08/20/2022 11:33	McKinley C Carter	2350065
	08/17/2022			08/20/2022 11:40	McKinley C Carter	2350066
SM 2540 C-2011	08/17/2022			08/19/2022 15:07	Yijie Li	2350053
SM 2540 D-2011	08/17/2022			08/19/2022 15:07	Yijie Li	2350053
SM 4500-F- C-2011	08/17/2022			08/19/2022 04:45	Adam P Silver	2350053
SM 5310 B-2011	08/17/2022			08/19/2022 23:08	Judith K. Clark	2350054