

Chemical Analysis Report

CEN-DIST-2022-10-20-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

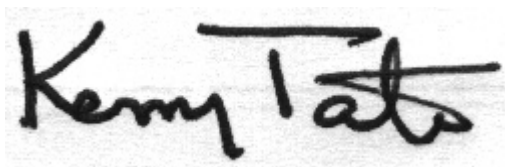
Event Description: **Bird Lake Slough sites and trib**
Request ID: **RQ-2022-10-17-22**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matthew Bearden

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 09-NOV-2022 10:32

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

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: Unnamed Slough @ HWY 50, 225 West of Zoltan Drive

Collection Date/Time: 10/19/2022 10:45

Field ID: G3CE0053

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2363933	DEP SOP: NU-094-1	Color (true)	130		PCU	P421192	
	EPA 180.1 Rev. 2.0	Turbidity	8.6		NTU	P421206	
	EPA 300.0 Rev. 2.1	Chloride	74		mg Cl/L	P421654	
		Sulfate	80		mg SO4/L	P421823	
	SM 2320 B-2011	Total Alkalinity	142		mg CaCO3/L	P421306	
	SM 2540 C-2015	TDS	429		mg/L	P421735	
	SM 2540 D-2015	TSS	5	I	mg/L	P421401	
2363935	SM 4500-F- C-2011	Fluoride	0.055	I	mg F/L	P421311	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.34		mg N/L	P421793	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P421572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P421377	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P421343	
2363941	SM 5310 B-2011	Organic Carbon	18		mg C/L	P421368	
	EPA 200.7 Rev. 4.4	Calcium	80.1		mg/L	P421233	
		Iron	2.48E+03		ug/L	P421233	
		Magnesium	6.62		mg/L	P421233	
		Potassium	4.5		mg/L	P421233	
		Sodium	47.0		mg/L	P421233	
		Strontium	609		ug/L	P421233	
		Tin	3.0	U	ug/L	P421233	
		Titanium	1.9	I	ug/L	P421233	
		Vanadium	2.7	I	ug/L	P421233	
		Zinc	5.0	U	ug/L	P421233	
	EPA 200.8 Rev. 5.4	Aluminum	138		ug/L	P421233	
		Antimony	0.12	I	ug/L	P421233	
		Arsenic	3.78		ug/L	P421233	
		Barium	17.5		ug/L	P421233	
		Beryllium	0.030	I	ug/L	P421233	
		Boron	60.5		ug/L	P421233	
		Cadmium	0.020	U	ug/L	P421233	
		Chromium	0.94	I	ug/L	P421233	
		Cobalt	0.092		ug/L	P421233	
		Copper	0.40	U	ug/L	P421233	
		Lead	0.22	I	ug/L	P421233	
		Manganese	36.1		ug/L	P421233	
		Molybdenum	0.98		ug/L	P421233	
		Nickel	0.50	U	ug/L	P421233	
		Selenium	0.20	U	ug/L	P421233	
		Silver	0.010	U	ug/L	P421233	
		Thallium	0.10	U	ug/L	P421233	
	SM 2340 B-2011	Hardness	227		mg/L	P421233	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Unnamed Slough @ Zoltan Drive

Collection Date/Time: 10/19/2022 10:30

Field ID: G3CE0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2363934	DEP SOP: NU-094-1	Color (true)	140		PCU	P421193	
	EPA 180.1 Rev. 2.0	Turbidity	7.4		NTU	P421206	
	EPA 300.0 Rev. 2.1	Chloride	78		mg Cl/L	P421654	
		Sulfate	69		mg SO4/L	P421823	
	SM 2320 B-2011	Total Alkalinity	110		mg CaCO3/L	P421456	
	SM 2540 C-2015	TDS	386		mg/L	P421735	
	SM 2540 D-2015	TSS	7	I	mg/L	P421401	
2363936	SM 4500-F- C-2011	Fluoride	0.049	I	mg F/L	P421462	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.37		mg N/L	P421858	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P421505	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P421377	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P421343	
2363942	SM 5310 B-2011	Organic Carbon	17		mg C/L	P421368	
	EPA 200.7 Rev. 4.4	Calcium	59.7		mg/L	P421233	
		Iron	1.72E+03		ug/L	P421233	
		Magnesium	6.85		mg/L	P421233	
		Potassium	4.7		mg/L	P421233	
		Sodium	48.1		mg/L	P421233	
		Strontium	498		ug/L	P421233	
		Tin	3.0	U	ug/L	P421233	
		Titanium	2.2	I	ug/L	P421233	
		Vanadium	3.0	I	ug/L	P421233	
		Zinc	5.0	U	ug/L	P421233	
	EPA 200.8 Rev. 5.4	Aluminum	223		ug/L	P421233	
		Antimony	0.13	I	ug/L	P421233	
		Arsenic	4.59		ug/L	P421233	
		Barium	16.2		ug/L	P421233	
		Beryllium	0.035	I	ug/L	P421233	
		Boron	65.3		ug/L	P421233	
		Cadmium	0.020	U	ug/L	P421233	
		Chromium	1.0	I	ug/L	P421233	
		Cobalt	0.112		ug/L	P421233	
		Copper	0.52	I	ug/L	P421233	
		Lead	0.40		ug/L	P421233	
		Manganese	36.6		ug/L	P421233	
		Molybdenum	1.08		ug/L	P421233	
		Nickel	0.50	U	ug/L	P421233	
		Selenium	0.20	I	ug/L	P421233	
		Silver	0.010	U	ug/L	P421233	
		Thallium	0.10	U	ug/L	P421233	
	SM 2340 B-2011	Hardness	177		mg/L	P421233	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P421192

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P421193

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421206

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421233

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: P421233

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421654

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421823

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421793

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421858

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421505

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421572

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421377

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421343

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

Reference Method: SM 2320 B-2011
Batch ID: P421306

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P421456

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

Reference Method: SM 2540 C-2015
Batch ID: P421735

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P421401

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P421311

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500-F- C-2011
Batch ID: P421462

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P421368

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: P421192

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.7		P	90 - 110

Reference Method: DEP SOP: NU-094-1
Batch ID: P421193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421206

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	80 - 120
Iron	105		P	80 - 120
Magnesium	105		P	80 - 120
Potassium	104		P	80 - 120
Sodium	96.9		P	80 - 120
Strontium	106		P	80 - 120
Tin	104		P	80 - 120
Titanium	100		P	80 - 120
Vanadium	99.9		P	80 - 120
Zinc	99.8		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.7		P	85 - 115
Antimony	98.4		P	85 - 115
Arsenic	101		P	85 - 115
Barium	101		P	85 - 115
Beryllium	91.7		P	85 - 115
Boron	99.6		P	85 - 115
Cadmium	96.7		P	85 - 115
Chromium	95.6		P	85 - 115
Cobalt	94.1		P	85 - 115
Copper	95.5		P	85 - 115
Lead	93.0		P	85 - 115
Manganese	95.4		P	85 - 115
Molybdenum	95.2		P	85 - 115
Nickel	95.5		P	85 - 115
Selenium	97.0		P	85 - 115
Silver	100		P	85 - 115
Thallium	97.8		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421654

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421823

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421793

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421858

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421505

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421572

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421377

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421343

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

Reference Method: SM 2320 B-2011
Batch ID: P421306

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.3		P	94 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-2011
Batch ID: P421456

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P421735

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

Reference Method: SM 2540 D-2015
Batch ID: P421401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	96.5		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P421311

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	96 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P421462

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.4		P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P421368

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: P421233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362992	Calcium	101	102	P/P	80 - 120
2362992	Iron	103	104	P/P	80 - 120
2362992	Magnesium	104	105	P/P	80 - 120
2362992	Potassium	100	101	P/P	80 - 120
2362992	Sodium	94.6		P	80 - 120
2362992	Strontium	104	104	P/P	80 - 120
2362992	Tin	102	105	P/P	80 - 120
2362992	Titanium	99.5	103	P/P	80 - 120
2362992	Vanadium	99.7	103	P/P	80 - 120
2362992	Zinc	98.9	102	P/P	80 - 120
2363965	Calcium	107		P	80 - 120
2363965	Iron	108		P	80 - 120
2363965	Magnesium	111		P	80 - 120
2363965	Potassium	107		P	80 - 120
2363965	Sodium	107		P	80 - 120
2363965	Strontium	101		P	80 - 120
2363965	Tin	103		P	80 - 120
2363965	Titanium	98.4		P	80 - 120
2363965	Vanadium	97.6		P	80 - 120
2363965	Zinc	98.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P421233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362992	Aluminum	93.7	92.8	P/P	80 - 120
2362992	Antimony	99.1	99.1	P/P	80 - 120
2362992	Arsenic	100	101	P/P	80 - 120
2362992	Barium	100	101	P/P	80 - 120
2362992	Beryllium	88.4	93.3	P/P	80 - 120
2362992	Boron	102	101	P/P	80 - 120
2362992	Cadmium	96.6	97.6	P/P	80 - 120
2362992	Chromium	94.9	95.3	P/P	80 - 120
2362992	Cobalt	94.9	94.7	P/P	80 - 120
2362992	Copper	96.5	96.5	P/P	80 - 120
2362992	Lead	93.3	93.1	P/P	80 - 120
2362992	Manganese	95.7	95.2	P/P	80 - 120
2362992	Molybdenum	97.0	96.3	P/P	80 - 120
2362992	Nickel	96.1	97.0	P/P	80 - 120
2362992	Selenium	92.2	95.3	P/P	80 - 120
2362992	Silver	100	99.4	P/P	80 - 120
2362992	Thallium	97.8	98.5	P/P	80 - 120
2363965	Aluminum	94.9		P	80 - 120
2363965	Antimony	99.4		P	80 - 120
2363965	Arsenic	100		P	80 - 120
2363965	Barium	102		P	80 - 120
2363965	Beryllium	89.7		P	80 - 120
2363965	Boron	102		P	80 - 120
2363965	Cadmium	98.2		P	80 - 120
2363965	Chromium	96.7		P	80 - 120
2363965	Cobalt	93.9		P	80 - 120
2363965	Copper	95.3		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P421233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363965	Lead	94.1		P	80 - 120
2363965	Manganese	95.0		P	80 - 120
2363965	Molybdenum	96.0		P	80 - 120
2363965	Nickel	96.8		P	80 - 120
2363965	Selenium	93.0		P	80 - 120
2363965	Silver	100		P	80 - 120
2363965	Thallium	98.8		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P421654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363953	Chloride	97.5		P	90 - 110
2364013	Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P421823

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363953	Sulfate	107		P	90 - 110
2364012	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P421793

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364041	Ammonia-N	99.8	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P421858

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363981	Ammonia-N	98.0	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363891	Kjeldahl Nitrogen	103	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363935	Kjeldahl Nitrogen	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P421377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363895	NO2NO3-N	109	110	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363935	Total-P	101	101	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P421311

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363260	Fluoride	97.8	97.8	P/P	94 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P421462

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364038	Fluoride	98.3	99.1	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P421368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363692	Organic Carbon	99.0	99.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P421192

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363886	Color (true)	2.18	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P421193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363980	Color (true)	0.498	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363737	Turbidity	12.3	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362992	Calcium	1.13	Spike	P	0 - 20
2362992	Iron	1.07	Spike	P	0 - 20
2362992	Magnesium	1.34	Spike	P	0 - 20
2362992	Potassium	0.267	Spike	P	0 - 20
2362992	Sodium	0.436	Spike	P	0 - 20
2362992	Strontium	0.0787	Spike	P	0 - 20
2362992	Tin	3.03	Spike	P	0 - 20
2362992	Titanium	3.48	Spike	P	0 - 20
2362992	Vanadium	3.49	Spike	P	0 - 20
2362992	Zinc	3.18	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362992	Aluminum	0.980	Spike	P	0 - 20
2362992	Antimony	0.0265	Spike	P	0 - 20
2362992	Arsenic	0.316	Spike	P	0 - 20
2362992	Barium	0.689	Spike	P	0 - 20
2362992	Beryllium	4.53	Spike	P	0 - 20
2362992	Boron	0.707	Spike	P	0 - 20
2362992	Cadmium	1.03	Spike	P	0 - 20
2362992	Chromium	0.422	Spike	P	0 - 20
2362992	Cobalt	0.208	Spike	P	0 - 20
2362992	Copper	0.0488	Spike	P	0 - 20
2362992	Lead	0.201	Spike	P	0 - 20
2362992	Manganese	0.424	Spike	P	0 - 20
2362992	Molybdenum	0.723	Spike	P	0 - 20
2362992	Nickel	0.874	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362992	Selenium	3.33	Spike	P	0 - 20
2362992	Silver	0.871	Spike	P	0 - 20
2362992	Thallium	0.793	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Chloride	0.629	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Sulfate	1.01	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364041	Ammonia-N	0.182	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421858

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363981	Ammonia-N	0.346	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363891	Kjeldahl Nitrogen	3.88	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363935	Kjeldahl Nitrogen	0.727	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363895	NO2NO3-N	0.358	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363935	Total-P	0.246	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P421306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363260	Total Alkalinity	0.317	Sample	P	0 - 3.8

Reference Method: SM 2320 B-2011
Batch ID: P421456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364038	Total Alkalinity	0.165	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P421735

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363803	TDS	6.09	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P421311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363260	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 4500-F- C-2011
Batch ID: P421462

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364038	Fluoride	0.483	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P421368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363692	Organic Carbon	0.698	Spike	P	0 - 20

Quality Assurance Report Precision

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A115432

Included Lab Sample IDs: 2363933, 2363934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	98.8	P/P	90 - 110
Color (true)	98.8	99.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A115436

Included Lab Sample IDs: 2363933, 2363934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	98.5	P/P	95 - 105

Reference Method: SM 2320 B-2011

Run ID: A115475

Included Lab Sample IDs: 2363933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	98.8	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A115475

Included Lab Sample IDs: 2363933

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A115490

Included Lab Sample IDs: 2363941, 2363942

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.3	94.1	P/P	90 - 110
Antimony	94.5	94.6	P/P	90 - 110
Arsenic	98.7	97.4	P/P	90 - 110
Barium	95.3	96.1	P/P	90 - 110
Beryllium	94.0	95.0	P/P	90 - 110
Boron	95.5	94.4	P/P	90 - 110
Cadmium	95.7	96.1	P/P	90 - 110
Chromium	92.7	92.0	P/P	90 - 110
Cobalt	91.9	90.9	P/P	90 - 110
Copper	93.5	92.1	P/P	90 - 110
Lead	90.4	91.0	P/P	90 - 110
Manganese	92.8	92.1	P/P	90 - 110
Molybdenum	96.4	95.5	P/P	90 - 110
Nickel	94.1	92.3	P/P	90 - 110
Selenium	96.8	93.6	P/P	90 - 110
Silver	97.3	97.1	P/P	90 - 110
Thallium	95.8	95.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A115496

Included Lab Sample IDs: 2363941, 2363942

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	90.7	93.2	P/P	90 - 110
Iron	91.5	93.7	P/P	90 - 110
Magnesium	91.1	93.9	P/P	90 - 110
Potassium	92.1	93.6	P/P	90 - 110
Sodium	91.7	92.7	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A115497

Included Lab Sample IDs: 2363935, 2363936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	99.4	P/P	90 - 110
Organic Carbon	98.6	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A115501

Included Lab Sample IDs: 2363935, 2363936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A115528

Included Lab Sample IDs: 2363941, 2363942

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	99.2	94.6	P/P	90 - 110
Tin	101	94.5	P/P	90 - 110
Titanium	101	93.5	P/P	90 - 110
Vanadium	101	93.5	P/P	90 - 110
Zinc	98.7	93.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A115530

Included Lab Sample IDs: 2363935, 2363936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.4	100	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A115538

Included Lab Sample IDs: 2363934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	96.5	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A115538

Included Lab Sample IDs: 2363934

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

Reference Method: SM 4500-F- C-2011

Run ID: A115538

Included Lab Sample IDs: 2363934

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A115558

Included Lab Sample IDs: 2363933, 2363934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.2	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A115618

Included Lab Sample IDs: 2363936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A115643

Included Lab Sample IDs: 2363935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	99.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A115675

Included Lab Sample IDs: 2363933, 2363934

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A115690

Included Lab Sample IDs: 2363935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A115726

Included Lab Sample IDs: 2363936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	97.5	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)	99.7				2.18	
	Color (true)	97.9				0.498	
EPA 180.1 Rev. 2.0	Turbidity	99.0				12.3	
EPA 200.7 Rev. 4.4	Calcium	104	101	102	107		1.13
	Iron	105	103	104	108		1.07
	Magnesium	105	104	105	111		1.34
	Potassium	104	100	101	107		0.267
	Sodium	96.9	94.6	107			0.436
	Strontium	106	104	104	101		0.0787
	Tin	104	102	105	103		3.03
	Titanium	100	99.5	103	98.4		3.48
	Vanadium	99.9	99.7	103	97.6		3.49
	Zinc	99.8	98.9	102	98.5		3.18
EPA 200.8 Rev. 5.4	Aluminum	93.7	93.7	92.8	94.9		0.980
	Antimony	98.4	99.1	99.1	99.4		0.0265
	Arsenic	101	100	101	100		0.316
	Barium	101	100	101	102		0.689
	Beryllium	91.7	88.4	93.3	89.7		4.53
	Boron	99.6	102	101	102		0.707
	Cadmium	96.7	96.6	97.6	98.2		1.03
	Chromium	95.6	94.9	95.3	96.7		0.422
	Cobalt	94.1	94.9	94.7	93.9		0.208
	Copper	95.5	96.5	96.5	95.3		0.0488
	Lead	93.0	93.3	93.1	94.1		0.201
	Manganese	95.4	95.7	95.2	95.0		0.424
	Molybdenum	95.2	97.0	96.3	96.0		0.723
	Nickel	95.5	96.1	97.0	96.8		0.874
	Selenium	97.0	92.2	95.3	93.0		3.33
	Silver	100	100	99.4	100		0.871
	Thallium	97.8	97.8	98.5	98.8		0.793
EPA 300.0 Rev. 2.1	Chloride	102	97.5	98.3		0.629	
	Sulfate	103	107	103		1.01	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	99.8	99.6			0.182
	Ammonia-N	97.8	98.0	98.4			0.346
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	103	98.4			3.88
	Kjeldahl Nitrogen	102	101	103			0.727
EPA 353.2 Rev. 2.0	NO2NO3-N	108	109	110			0.358
EPA 365.1 Rev. 2.0	Total-P	104	101	101			0.246
SM 2320 B-2011	Total Alkalinity	99.3				0.317	
	Total Alkalinity	103				0.165	
SM 2540 C-2015	TDS	97.9				6.09	
SM 2540 D-2015	TSS	96.5					
SM 4500-F- C-2011	Fluoride	98.2	97.8	97.8			0.0
	Fluoride	97.4	98.3	99.1			0.483
SM 5310 B-2011	Organic Carbon	100	99.0	99.7			0.698

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2363933, 2363934
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2363933, 2363934
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2363941, 2363942

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2363941, 2363942
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2363933, 2363934
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2363933, 2363934
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2363935, 2363936
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2363935, 2363936
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2363935, 2363936
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2363935, 2363936
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2363933, 2363934
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2363941, 2363942
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2363933, 2363934
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2363933, 2363934
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2363933, 2363934
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2363935, 2363936

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	10/20/2022			10/20/2022 13:56	Anna M. Plaviak	2363933
	10/20/2022			10/20/2022 14:00	Anna M. Plaviak	2363934
EPA 180.1 Rev. 2.0	10/20/2022			10/20/2022 13:59	Chandler E Cox	2363933
	10/20/2022			10/20/2022 14:00	Chandler E Cox	2363934
EPA 200.7 Rev. 4.4	10/20/2022	10/21/2022 11:20	George D Taylor	10/25/2022 00:28	McKinley C Carter	2363941
	10/20/2022	10/21/2022 11:20	George D Taylor	10/25/2022 00:35	McKinley C Carter	2363942
	10/20/2022	10/21/2022 11:20	George D Taylor	10/25/2022 18:53	McKinley C Carter	2363941
	10/20/2022	10/21/2022 11:20	George D Taylor	10/25/2022 19:01	McKinley C Carter	2363942
EPA 200.8 Rev. 5.4	10/20/2022	10/21/2022 11:20	George D Taylor	10/24/2022 20:39	Emily M Philpot	2363941
	10/20/2022	10/21/2022 11:20	George D Taylor	10/24/2022 20:49	Emily M Philpot	2363942
EPA 300.0 Rev. 2.1	10/20/2022			10/29/2022 03:30	Anna M. Plaviak	2363933
	10/20/2022			10/29/2022 03:45	Anna M. Plaviak	2363934
	10/20/2022			11/02/2022 18:02	Anna M. Plaviak	2363933
	10/20/2022			11/02/2022 18:17	Anna M. Plaviak	2363934
EPA 350.1 Rev. 2.0	10/20/2022			11/02/2022 12:41	Ping Hua	2363935
	10/20/2022			11/03/2022 15:20	Ping Hua	2363936
EPA 351.2 Rev. 2.0	10/20/2022	10/27/2022 11:24	Alexandra J Mattheus	10/28/2022 13:49	Alexandra J Mattheus	2363936
	10/20/2022	10/28/2022 11:18	Simonne.V. Calhoun	10/31/2022 12:15	Alexandra J Mattheus	2363935
EPA 353.2 Rev. 2.0	10/20/2022			10/25/2022 10:55	Beverly Y. Sanders	2363935
	10/20/2022			10/25/2022 10:56	Beverly Y. Sanders	2363936
EPA 365.1 Rev. 2.0	10/20/2022	10/25/2022 12:45	Simonne.V. Calhoun	10/26/2022 10:07	James L Waggeberby	2363935
	10/20/2022	10/25/2022 12:45	Simonne.V. Calhoun	10/26/2022 10:11	James L Waggeberby	2363936
SM 2320 B-2011	10/20/2022			10/22/2022 15:40	Dale L. Simmons	2363933
	10/20/2022			10/25/2022 20:55	Adam P Silver	2363934
SM 2340 B-2011	10/20/2022			10/25/2022 00:28	McKinley C Carter	2363941
	10/20/2022			10/25/2022 00:35	McKinley C Carter	2363942
SM 2540 C-2015	10/20/2022			10/21/2022 17:06	Yijie Li	2363933, 2363934
SM 2540 D-2015	10/20/2022			10/21/2022 17:06	Yijie Li	2363933, 2363934
SM 4500-F- C-2011	10/20/2022			10/22/2022 15:40	Dale L. Simmons	2363933
	10/20/2022			10/25/2022 20:55	Adam P Silver	2363934
SM 5310 B-2011	10/20/2022			10/25/2022 08:36	Judith K. Clark	2363935
	10/20/2022			10/25/2022 09:22	Judith K. Clark	2363936