

Chemical Analysis Report

NW-DIST-2023-12-08-01

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

Event Description: **Santa Rosa make-up + Blank**
Request ID: **RQ-2023-12-04-42**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government Street
Suite 208
Pensacola, FL 32502-5794
Attn: Myranda Butler

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Kerry Tate, Ph.D.
Marek Topolski, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Marek Topolski, Environmental Specialist III

Date Certified: 04-JAN-2024 08:53

A handwritten signature in black ink, appearing to read "Marek Topolski", with a stylized, flowing script.

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: WILLIAMS CREEK UPSTREAM OF HWY 98

Collection Date/Time: 12/07/2023 13:05

Field ID: G4NW0531

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2455716	DEP SOP: NU-094-1	Color (true)	55	A	PCU	P438722	
	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P438725	
	EPA 300.0 Rev. 2.1	Chloride	47		mg Cl/L	P439438	
		Sulfate	12		mg SO4/L	P439443	
	SM 2320 B-2011	Total Alkalinity	8.1		mg CaCO3/L	P438822	
	SM 2540 C-2015	TDS	123	A	mg/L	P439248	
	SM 2540 D-2015	TSS	3	IA	mg/L	P439288	
	SM 4500-F- C-2011	Fluoride	0.027	I	mg F/L	P438825	
2455717	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P438987	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.28		mg N/L	P438854	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P438890	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P438871	
	SM 5310 B-2014	Organic Carbon	8.3		mg C/L	P438782	

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: BEAR CREEK 40M BLW LAKE DAM OUTFALL Collection Date/Time: 12/07/2023 10:15

Field ID: G4NW0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2455714	DEP SOP: NU-094-1	Color (true)	10		PCU	P438722	
	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P438726	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P439438	
		Sulfate	0.45	I	mg SO4/L	P439443	
	SM 2320 B-2011	Total Alkalinity	5.6		mg CaCO3/L	P438822	
	SM 2540 C-2015	TDS	19	I	mg/L	P439247	
	SM 2540 D-2015	TSS	2	I	mg/L	P439287	
	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P438825	
2455715	EPA 350.1 Rev. 2.0	Ammonia-N	0.059		mg N/L	P438987	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P438854	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P438890	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P438871	
	SM 5310 B-2014	Organic Carbon	4.8		mg C/L	P438782	
2455734	EPA 200.7 Rev. 4.4	Calcium	2.10		mg/L	P438801	
		Iron	200		ug/L	P438801	
		Magnesium	0.82		mg/L	P438801	
		Potassium	0.30	U	mg/L	P438801	
		Sodium	1.6	I	mg/L	P438801	
		Strontium	3.6	I	ug/L	P438801	
		Tin	3.0	U	ug/L	P438801	
		Titanium	0.75	U	ug/L	P438801	
		Vanadium	2.0	U	ug/L	P438801	
		Zinc	5.0	U	ug/L	P438801	
	EPA 200.8 Rev. 5.4	Aluminum	16	I	ug/L	P438801	
		Antimony	0.050	U	ug/L	P438801	
		Arsenic	0.17	I	ug/L	P438801	
		Barium	7.02		ug/L	P438801	
		Beryllium	0.010	U	ug/L	P438801	
		Boron	9.5		ug/L	P438801	
		Cadmium	0.020	U	ug/L	P438801	
		Chromium	0.40	U	ug/L	P438801	
		Cobalt	0.022	I	ug/L	P438801	
		Copper	0.40	U	ug/L	P438801	
		Lead	0.20	U	ug/L	P438801	
		Manganese	9.27		ug/L	P438801	
		Molybdenum	0.15	U	ug/L	P438801	
		Nickel	0.50	U	ug/L	P438801	
		Selenium	0.20	U	ug/L	P438801	
		Silver	0.010	U	ug/L	P438801	
		Thallium	0.10	U	ug/L	P438801	
		Hardness	8.6		mg/L	P438801	

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: FB

Collection Date/Time: 12/07/2023 10:20

Field ID: FB_12072023

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2455718	DEP SOP: NU-094-1	Color (true)	2.5	U	PCU	P438722	
	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P438726	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P439438	
		Sulfate	0.20	U	mg SO4/L	P439443	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P438822	
	SM 2540 C-2015	TDS	15	U	mg/L	P439247	
	SM 2540 D-2015	TSS	2	U	mg/L	P439287	
2455719	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P438825	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P438987	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P438854	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P438890	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P438968	
2455735	SM 5310 B-2014	Organic Carbon	0.50	U	mg C/L	P438782	
	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P438801	
		Iron	30	U	ug/L	P438801	
		Magnesium	0.040	U	mg/L	P438801	
		Potassium	0.30	U	mg/L	P438801	
		Sodium	0.50	U	mg/L	P438801	
		Strontium	2.0	U	ug/L	P438801	
		Tin	3.0	U	ug/L	P438801	
		Titanium	0.75	U	ug/L	P438801	
		Vanadium	2.0	U	ug/L	P438801	
		Zinc	5.0	U	ug/L	P438801	
		Aluminum	5.0	U	ug/L	P438801	
		Antimony	0.050	U	ug/L	P438801	
		Arsenic	0.050	U	ug/L	P438801	
		Barium	0.20	U	ug/L	P438801	
		Beryllium	0.010	U	ug/L	P438801	
		Boron	2.0	U	ug/L	P438801	
		Cadmium	0.020	U	ug/L	P438801	
		Chromium	0.40	U	ug/L	P438801	
		Cobalt	0.020	U	ug/L	P438801	
		Copper	0.40	U	ug/L	P438801	
		Lead	0.20	U	ug/L	P438801	
		Manganese	0.10	U	ug/L	P438801	
		Molybdenum	0.15	U	ug/L	P438801	
		Nickel	0.50	U	ug/L	P438801	
		Selenium	0.20	U	ug/L	P438801	
		Silver	0.010	U	ug/L	P438801	
		Thallium	0.10	U	ug/L	P438801	

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: P438722

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438725

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438726

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438801

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: P438801

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: P439438

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439443

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438987

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438854

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438890

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438871

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438968

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

Reference Method: SM 2320 B-2011
Batch ID: P438822

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

Reference Method: SM 2540 C-2015
Batch ID: P439247

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2015
Batch ID: P439248

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P439287

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P439288

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P438825

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2014
Batch ID: P438782

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: P438722

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438725

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438726

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438801

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	102		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	101		P	85 - 115
Sodium	101		P	85 - 115
Strontium	103		P	85 - 115
Tin	102		P	85 - 115
Titanium	100		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438801

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	101		P	85 - 115
Barium	101		P	85 - 115
Beryllium	92.5		P	85 - 115
Boron	104		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	112		P	85 - 115
Cobalt	100		P	85 - 115
Copper	101		P	85 - 115
Lead	102		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	99.9		P	85 - 115
Nickel	103		P	85 - 115
Selenium	100		P	85 - 115
Silver	103		P	85 - 115
Thallium	101		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439438

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439443

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438987

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: P438854

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438890

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438871

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438968

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

Reference Method: SM 2320 B-2011
Batch ID: P438822

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.7		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P439247

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2540 C-2015
Batch ID: P439248

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	95.2		P	85 - 115

Reference Method: SM 2540 D-2015
Batch ID: P439287

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

Reference Method: SM 2540 D-2015
Batch ID: P439288

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	105		P	85 - 115

Reference Method: SM 4500-F- C-2011
Batch ID: P438825

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

Reference Method: SM 5310 B-2014
Batch ID: P438782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P438801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455552	Calcium	101	101	P/P	80 - 120
2455552	Iron	102	102	P/P	80 - 120
2455552	Magnesium	102	102	P/P	80 - 120
2455552	Potassium	102	101	P/P	80 - 120
2455552	Sodium	102		P	80 - 120
2455552	Strontium	102	102	P/P	80 - 120
2455552	Tin	102	103	P/P	80 - 120
2455552	Titanium	96.9	95.6	P/P	80 - 120
2455552	Vanadium	101	101	P/P	80 - 120
2455552	Zinc	103	104	P/P	80 - 120
2455734	Calcium	101		P	80 - 120
2455734	Iron	100		P	80 - 120
2455734	Magnesium	102		P	80 - 120
2455734	Potassium	101		P	80 - 120
2455734	Sodium	103		P	80 - 120
2455734	Strontium	97.1		P	80 - 120
2455734	Tin	99.8		P	80 - 120
2455734	Titanium	99.4		P	80 - 120
2455734	Vanadium	101		P	80 - 120
2455734	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P438801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455552	Aluminum	99.2	100	P/P	80 - 120
2455552	Antimony	103	104	P/P	80 - 120
2455552	Arsenic	101	101	P/P	80 - 120
2455552	Barium	101	102	P/P	80 - 120
2455552	Beryllium	94.3	91.7	P/P	80 - 120
2455552	Boron	102	104	P/P	80 - 120
2455552	Cadmium	101	102	P/P	80 - 120
2455552	Chromium	99.2	96.7	P/P	80 - 120
2455552	Cobalt	98.7	98.9	P/P	80 - 120
2455552	Copper	98.9	99.5	P/P	80 - 120
2455552	Lead	102	103	P/P	80 - 120
2455552	Manganese	98.2	103	P/P	80 - 120
2455552	Molybdenum	100	101	P/P	80 - 120
2455552	Nickel	97.4	96.9	P/P	80 - 120
2455552	Selenium	100	100	P/P	80 - 120
2455552	Silver	101	102	P/P	80 - 120
2455552	Thallium	102	103	P/P	80 - 120
2455734	Aluminum	99.8		P	80 - 120
2455734	Antimony	103		P	80 - 120
2455734	Arsenic	100		P	80 - 120
2455734	Barium	101		P	80 - 120
2455734	Beryllium	93.6		P	80 - 120
2455734	Boron	103		P	80 - 120
2455734	Cadmium	98.8		P	80 - 120
2455734	Chromium	101		P	80 - 120
2455734	Cobalt	98.4		P	80 - 120
2455734	Copper	99.1		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455734	Lead	102		P	80 - 120
2455734	Manganese	98.7		P	80 - 120
2455734	Molybdenum	99.3		P	80 - 120
2455734	Nickel	97.5		P	80 - 120
2455734	Selenium	99.2		P	80 - 120
2455734	Silver	102		P	80 - 120
2455734	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439438

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455788	Chloride	92.8		P	90 - 110
2456018	Chloride	96.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455788	Sulfate	92.7		P	90 - 110
2456018	Sulfate	94.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455704	Ammonia-N	99.0	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456255	Kjeldahl Nitrogen	102	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438890

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455630	NO2NO3-N	96.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455671	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455774	Total-P	110	108	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P438825

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455777	Fluoride	102	102	P/P	94 - 106

Reference Method: SM 5310 B-2014
Batch ID: P438782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455518	Organic Carbon	98.6	98.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P438722

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455716	Color (true)	0.00732	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455625	Turbidity	15.4	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455701	Turbidity	11.7	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455552	Calcium	0.390	Spike	P	0 - 20
2455552	Iron	0.328	Spike	P	0 - 20
2455552	Magnesium	0.149	Spike	P	0 - 20
2455552	Potassium	1.17	Spike	P	0 - 20
2455552	Sodium	0.154	Spike	P	0 - 20
2455552	Strontium	0.274	Spike	P	0 - 20
2455552	Tin	0.515	Spike	P	0 - 20
2455552	Titanium	1.26	Spike	P	0 - 20
2455552	Vanadium	0.123	Spike	P	0 - 20
2455552	Zinc	1.26	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455552	Aluminum	0.733	Spike	P	0 - 20
2455552	Antimony	0.728	Spike	P	0 - 20
2455552	Arsenic	0.0579	Spike	P	0 - 20
2455552	Barium	0.279	Spike	P	0 - 20
2455552	Beryllium	2.44	Spike	P	0 - 20
2455552	Boron	1.53	Spike	P	0 - 20
2455552	Cadmium	1.93	Spike	P	0 - 20
2455552	Chromium	1.73	Spike	P	0 - 20
2455552	Cobalt	0.221	Spike	P	0 - 20
2455552	Copper	0.143	Spike	P	0 - 20
2455552	Lead	0.697	Spike	P	0 - 20
2455552	Manganese	3.95	Spike	P	0 - 20
2455552	Molybdenum	0.454	Spike	P	0 - 20
2455552	Nickel	0.447	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455552	Selenium	0.314	Spike	P	0 - 20
2455552	Silver	0.320	Spike	P	0 - 20
2455552	Thallium	1.53	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455788	Chloride	0.550	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455788	Sulfate	1.18	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455704	Ammonia-N	1.89	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456255	Kjeldahl Nitrogen	2.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455630	NO2NO3-N	1.26	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455671	Total-P	0.369	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
--------------------------	-----------	-----------	-------------------	-----------	----------------

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455774	Total-P	1.73	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P438822

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455777	Total Alkalinity	0.100	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P439247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455264	TDS	4.16	Sample	P	0 - 10

Reference Method: SM 2540 C-2015
Batch ID: P439248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455716	TDS	6.50	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P438825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455777	Fluoride	0.0	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2014
Batch ID: P438782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455518	Organic Carbon	0.175	Spike	P	0 - 15

* 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: A123108

Included Lab Sample IDs: 2455714, 2455716, 2455718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A123111

Included Lab Sample IDs: 2455714, 2455716, 2455718

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

Reference Method: SM 5310 B-2014

Run ID: A123141

Included Lab Sample IDs: 2455715, 2455717, 2455719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	100	P/P	85 - 115

Reference Method: SM 2320 B-2011

Run ID: A123158

Included Lab Sample IDs: 2455714, 2455716, 2455718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.3	94.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A123158

Included Lab Sample IDs: 2455714, 2455716, 2455718

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A123188

Included Lab Sample IDs: 2455715, 2455717, 2455719

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A123205

Included Lab Sample IDs: 2455734, 2455735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	101	P/P	90 - 110
Aluminum	99.1	102	P/P	90 - 110
Antimony	101	102	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Barium	100	101	P/P	90 - 110
Barium	99.8	100	P/P	90 - 110
Beryllium	93.5	97.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A123205

Included Lab Sample IDs: 2455734, 2455735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	97.3	96.3	P/P	90 - 110
Boron	101	100	P/P	90 - 110
Boron	98.0	101	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Cadmium	98.4	100	P/P	90 - 110
Chromium	102	102	P/P	90 - 110
Chromium	99.2	102	P/P	90 - 110
Cobalt	101	99.9	P/P	90 - 110
Cobalt	98.4	101	P/P	90 - 110
Copper	98.0	99.1	P/P	90 - 110
Copper	99.1	98.8	P/P	90 - 110
Lead	100	102	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Manganese	101	101	P/P	90 - 110
Molybdenum	101	101	P/P	90 - 110
Molybdenum	101	102	P/P	90 - 110
Nickel	101	100	P/P	90 - 110
Nickel	98.7	101	P/P	90 - 110
Selenium	100	102	P/P	90 - 110
Selenium	102	101	P/P	90 - 110
Silver	102	104	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Thallium	100	103	P/P	90 - 110
Thallium	103	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A123220

Included Lab Sample IDs: 2455734, 2455735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.7	99.0	P/P	95 - 105
Calcium	99.7	103	P/P	90 - 110
Iron	98.5	102	P/P	90 - 110
Iron	99.0	98.6	P/P	95 - 105
Magnesium	98.6	102	P/P	90 - 110
Magnesium	99.2	98.3	P/P	95 - 105
Potassium	97.5	97.8	P/P	95 - 105
Potassium	99.6	103	P/P	90 - 110
Sodium	100	105	P/P	90 - 110
Sodium	98.1	99.6	P/P	95 - 105
Strontium	100	104	P/P	95 - 105
Tin	103	105	P/P	95 - 105
Tin	104	110	P/P	90 - 110
Titanium	102	103	P/P	95 - 105
Titanium	103	107	P/P	90 - 110
Vanadium	102	104	P/P	95 - 105
Vanadium	103	107	P/P	90 - 110
Zinc	104	109	P/P	90 - 110
Zinc	104	105	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A123222

Included Lab Sample IDs: 2455715, 2455717, 2455719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A123224

Included Lab Sample IDs: 2455717

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.5	98.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A123230

Included Lab Sample IDs: 2455715, 2455717, 2455719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A123232

Included Lab Sample IDs: 2455715

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A123244

Included Lab Sample IDs: 2455735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Manganese	105	107	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A123261

Included Lab Sample IDs: 2455734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	98.9	97.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A123263

Included Lab Sample IDs: 2455719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.5	95.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A123338

Included Lab Sample IDs: 2455714, 2455716, 2455718

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

Quality Assurance Report

Calibration Verification

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision	MS
							SMP	
DEP SOP: NU-094-1	Color (true)	101					0.0073	
EPA 180.1 Rev. 2.0	Turbidity	103					15.4	
	Turbidity	103					11.7	
EPA 200.7 Rev. 4.4	Calcium	104	101	101	101			0.390
	Iron	102	102	102	100			0.328
	Magnesium	103	102	102	102			0.149
	Potassium	101	102	101	101			1.17
	Sodium	101	102	103				0.154
	Strontium	103	102	102	97.1			0.274
	Tin	102	102	103	99.8			0.515
	Titanium	100	96.9	95.6	99.4			1.26
	Vanadium	102	101	101	101			0.123
	Zinc	102	103	104	101			1.26
EPA 200.8 Rev. 5.4	Aluminum	101	99.2	100	99.8			0.733
	Antimony	103	103	104	103			0.728
	Arsenic	101	101	101	100			0.0579
	Barium	101	101	102	101			0.279
	Beryllium	92.5	94.3	91.7	93.6			2.44
	Boron	104	102	104	103			1.53
	Cadmium	99.0	101	102	98.8			1.93
	Chromium	112	101	99.2	96.7			1.73
	Cobalt	100	98.7	98.9	98.4			0.221
	Copper	101	98.9	99.5	99.1			0.143
	Lead	102	102	103	102			0.697
	Manganese	101	98.2	103	98.7			3.95
	Molybdenum	99.9	100	101	99.3			0.454
	Nickel	103	97.4	96.9	97.5			0.447
	Selenium	100	100	100	99.2			0.314
	Silver	103	101	102	102			0.320
	Thallium	101	102	103	103			1.53
EPA 300.0 Rev. 2.1	Chloride	102	92.8	96.5			0.550	
	Sulfate	102	92.7	94.3			1.18	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	99.0	101				1.89
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	102	98.3				2.94
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	96.2					1.26
EPA 365.1 Rev. 2.0	Total-P	106	106	105				0.369
	Total-P	106	110	108				1.73
SM 2320 B-2011	Total Alkalinity	98.7					0.100	
SM 2540 C-2015	TDS	96.4					4.16	
	TDS	95.2					6.50	
SM 2540 D-2015	TSS	102						
	TSS	105						
SM 4500-F- C-2011	Fluoride	103	102	102				0.0
SM 5310 B-2014	Organic Carbon	101	98.6	98.5				0.175

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2455714, 2455716, 2455718
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2455714, 2455716, 2455718
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2455734, 2455735

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	2455734, 2455735
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2455714, 2455716, 2455718
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2455714, 2455716, 2455718
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2455715, 2455717, 2455719
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2455715, 2455717, 2455719
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2455715, 2455717, 2455719
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2455715, 2455717, 2455719
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2455714, 2455716, 2455718
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2455734
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2455714, 2455716, 2455718
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2455714, 2455716, 2455718
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2455714, 2455716, 2455718
SM 5310 B-2014	Nonpurgeable Organic Carbon in aqueous matrices	2455715, 2455717, 2455719

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	12/08/2023			12/08/2023 14:46	Samantha L Bates	2455714
	12/08/2023			12/08/2023 14:47	Samantha L Bates	2455716
	12/08/2023			12/08/2023 14:48	Samantha L Bates	2455718
EPA 180.1 Rev. 2.0	12/08/2023			12/08/2023 14:08	Anna M. Plaviak	2455716
	12/08/2023			12/08/2023 15:12	Anna M. Plaviak	2455714
	12/08/2023			12/08/2023 15:14	Anna M. Plaviak	2455718
EPA 200.7 Rev. 4.4	12/08/2023	12/12/2023 11:45	George D Taylor	12/13/2023 13:39	McKinley C Carter	2455735
	12/08/2023	12/12/2023 11:45	George D Taylor	12/13/2023 17:17	McKinley C Carter	2455734
	12/08/2023	12/12/2023 11:45	George D Taylor	12/15/2023 11:48	Chase Roberts	2455734
EPA 200.8 Rev. 5.4	12/08/2023	12/12/2023 11:45	George D Taylor	12/13/2023 17:54	Conrad Hartmann	2455735
	12/08/2023	12/12/2023 11:45	George D Taylor	12/13/2023 20:33	Conrad Hartmann	2455734
	12/08/2023	12/12/2023 11:45	George D Taylor	12/14/2023 23:12	Emily M Philpot	2455735
EPA 300.0 Rev. 2.1	12/08/2023			12/22/2023 14:22	James L Waggeberby	2455714
	12/08/2023			12/22/2023 14:37	James L Waggeberby	2455716
	12/08/2023			12/22/2023 14:52	James L Waggeberby	2455718
EPA 350.1 Rev. 2.0	12/08/2023			12/14/2023 11:57	Khloe J Berg	2455715
	12/08/2023			12/14/2023 11:59	Khloe J Berg	2455717
	12/08/2023			12/14/2023 12:00	Khloe J Berg	2455719
EPA 351.2 Rev. 2.0	12/08/2023	12/13/2023 09:31	Samantha L Bates	12/14/2023 10:28	Samantha L Bates	2455715
	12/08/2023	12/13/2023 09:31	Samantha L Bates	12/14/2023 10:29	Samantha L Bates	2455717
	12/08/2023	12/13/2023 09:31	Samantha L Bates	12/14/2023 10:31	Samantha L Bates	2455719
EPA 353.2 Rev. 2.0	12/08/2023			12/12/2023 13:40	Fadila Guebre	2455715
	12/08/2023			12/12/2023 13:41	Fadila Guebre	2455717
	12/08/2023			12/12/2023 13:42	Fadila Guebre	2455719
EPA 365.1 Rev. 2.0	12/08/2023	12/13/2023 13:13	Adam P Silver	12/14/2023 11:29	James L Waggeberby	2455717
	12/08/2023	12/13/2023 13:13	Adam P Silver	12/14/2023 14:57	James L Waggeberby	2455715
	12/08/2023	12/14/2023 11:55	Adam P Silver	12/15/2023 13:42	James L Waggeberby	2455719
SM 2320 B-2011	12/08/2023			12/12/2023 00:33	Adam P Silver	2455714
	12/08/2023			12/12/2023 00:44	Adam P Silver	2455716
	12/08/2023			12/12/2023 00:53	Adam P Silver	2455718
SM 2340 B-2011	12/08/2023			12/13/2023 17:17	McKinley C Carter	2455734
SM 2540 C-2015	12/08/2023			12/12/2023 15:24	Yijie Li	2455714, 2455716, 2455718
SM 2540 D-2015	12/08/2023			12/12/2023 15:24	Yijie Li	2455714, 2455716, 2455718
SM 4500-F- C-2011	12/08/2023			12/12/2023 00:33	Adam P Silver	2455714
	12/08/2023			12/12/2023 00:44	Adam P Silver	2455716
	12/08/2023			12/12/2023 00:53	Adam P Silver	2455718
SM 5310 B-2014	12/08/2023			12/11/2023 20:17	Kenneth H Lee	2455715
	12/08/2023			12/11/2023 20:31	Kenneth H Lee	2455717
	12/08/2023			12/11/2023 20:44	Kenneth H Lee	2455719