

Chemical Analysis Report

NW-DIST-2023-06-15-03

Florida DEP Laboratory
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DOH Accreditation E31780

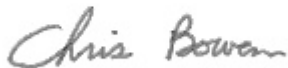
Event Description: **Lake Powell Continuous Monitoring Deploy**
Request ID: **RQ-2023-06-12-66**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 30-JUN-2023 10:19



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: SISTER RIVER MOUTH

Collection Date/Time: 06/14/2023 10:40

Field ID: G3NW0154

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2417599	EPA 200.7 Rev. 4.4	Calcium	20.6		mg/L	P431414	
		Iron	640		ug/L	P431414	
		Magnesium	3.32		mg/L	P431414	
		Potassium	1.1	I	mg/L	P431414	
		Sodium	5.1		mg/L	P431414	
		Strontium	49.5		ug/L	P431414	
		Tin	3.0	U	ug/L	P431414	
		Titanium	9.5		ug/L	P431414	
		Vanadium	2.0	U	ug/L	P431414	
		Zinc	5.0	U	ug/L	P431414	
	EPA 200.8 Rev. 5.4	Aluminum	150		ug/L	P431414	
		Antimony	0.13	I	ug/L	P431414	
		Arsenic	2.80		ug/L	P431414	
		Barium	3.87		ug/L	P431414	
		Beryllium	0.010	U	ug/L	P431414	
		Boron	55.2		ug/L	P431414	
		Cadmium	0.020	U	ug/L	P431414	
		Chromium	0.40	U	ug/L	P431414	
		Cobalt	0.031	I	ug/L	P431414	
		Copper	0.86		ug/L	P431414	
		Lead	0.20	U	ug/L	P431414	
		Manganese	6.53		ug/L	P431414	
		Molybdenum	0.31	I	ug/L	P431414	
		Nickel	0.50	U	ug/L	P431414	
		Selenium	0.20	U	ug/L	P431414	
		Silver	0.010	U	ug/L	P431414	
		Thallium	0.10	U	ug/L	P431414	
	SM 2340 B-2011	Hardness	65.0		mg/L	P431414	

Sample Location: LAKE POWELL DRAIN EAST ARM

Collection Date/Time: 06/14/2023 12:35

Field ID: G3NW0009

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2417571	DEP SOP: NU-094-1	Color (true)	52	A	PCU	P431339	
	EPA 180.1 Rev. 2.0	Turbidity	3.7		NTU	P431349	
	EPA 300.0 Rev. 2.1	Chloride	7.6E+03		mg Cl/L	P431682	
		Sulfate	1.0E+03		mg SO4/L	P431685	
	SM 2320 B-2011	Total Alkalinity	51		mg CaCO3/L	P431796	
	SM 2540 C-2015	TDS	1.39E+04		mg/L	P431886	
	SM 2540 D-2015	TSS	6	I	mg/L	P431827	
2417572	SM 4500-F- C-2011	Fluoride	0.54		mg F/L	P431698	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P431486	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.28	I	mg N/L	P431648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P431862	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P431452	
	SM 5310 B-2011	Organic Carbon	6.5		mg C/L	P431591	

Ref. Method and Comment:

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

SM 4500-F- C-2011: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.

Sample Location: TUCKER BAYOU E CHOCTAWHATCHEE BAY Collection Date/Time: 06/14/2023 13:45

Field ID: G3NW0010

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2417573	DEP SOP: NU-094-1	Color (true)	16		PCU	P431339	
	EPA 180.1 Rev. 2.0	Turbidity	9.2	A	NTU	P431349	
	EPA 300.0 Rev. 2.1	Chloride	6.7E+03		mg Cl/L	P431682	
		Sulfate	930		mg SO4/L	P431685	
	SM 2320 B-2011	Total Alkalinity	68		mg CaCO3/L	P431796	
	SM 2540 C-2015	TDS	1.22E+04		mg/L	P431886	
	SM 2540 D-2015	TSS	4	IA	mg/L	P431827	
	SM 4500-F- C-2011	Fluoride	0.50		mg F/L	P431698	
2417575	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P431661	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P431648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P431862	
	EPA 365.1 Rev. 2.0	Total-P	0.041		mg P/L	P431452	
	SM 5310 B-2011	Organic Carbon	4.0		mg C/L	P431591	

Ref. Method and Comment:

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

SM 4500-F- C-2011: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.

Sample Location: POWELL LAKE CENTER N OF CAIN RD AREA Collection Date/Time: 06/14/2023 13:00

Field ID: G3NW0012

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2417574	DEP SOP: NU-094-1	Color (true)	20		PCU	P431339	
	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P431349	
	EPA 300.0 Rev. 2.1	Chloride	1.2E+04		mg Cl/L	P431682	
		Sulfate	1.6E+03		mg SO4/L	P431685	
	SM 2320 B-2011	Total Alkalinity	75		mg CaCO3/L	P431796	
	SM 2540 C-2015	TDS	2.12E+04		mg/L	P431886	
	SM 2540 D-2015	TSS	8	I	mg/L	P431827	
	SM 4500-F- C-2011	Fluoride	0.79		mg F/L	P431698	
2417576	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P431661	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32	I	mg N/L	P431648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P431862	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P431452	
	SM 5310 B-2011	Organic Carbon	4.5		mg C/L	P431591	

Ref. Method and Comment:

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

SM 4500-F- C-2011: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P431339

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P431349

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P431414

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: P431414

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: P431682

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: P431685

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431486

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431661

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431648

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431862

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431452

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

Reference Method: SM 2320 B-2011
Batch ID: P431796

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

Reference Method: SM 2540 C-2015
Batch ID: P431886

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P431827

Component	Result	Code	Units
TSS	3	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P431698

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P431591

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: P431339

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: P431349

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	98.7		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P431414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	110		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	107		P	85 - 115
Sodium	106		P	85 - 115
Strontium	108		P	85 - 115
Tin	108		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	107		P	85 - 115
Zinc	110		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P431414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.9		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	101		P	85 - 115
Barium	102		P	85 - 115
Beryllium	94.6		P	85 - 115
Boron	103		P	85 - 115
Cadmium	99.5		P	85 - 115
Chromium	97.4		P	85 - 115
Cobalt	101		P	85 - 115
Copper	102		P	85 - 115
Lead	95.3		P	85 - 115
Manganese	98.1		P	85 - 115
Molybdenum	98.4		P	85 - 115
Nickel	102		P	85 - 115
Selenium	102		P	85 - 115
Silver	104		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P431682

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.9		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P431685

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431486

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431661

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431648

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431862

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431452

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

Reference Method: SM 2320 B-2011
Batch ID: P431796

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.9		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P431886

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

Reference Method: SM 2540 D-2015
Batch ID: P431827

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	98.5		P	85 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P431698

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

Reference Method: SM 5310 B-2011
Batch ID: P431591

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P431414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417441	Calcium	104		P	80 - 120
2417441	Iron	108	107	P/P	80 - 120
2417441	Magnesium	106	105	P/P	80 - 120
2417441	Potassium	105	104	P/P	80 - 120
2417441	Sodium	109	109	P/P	80 - 120
2417441	Strontium	106	106	P/P	80 - 120
2417441	Tin	109	109	P/P	80 - 120
2417441	Titanium	102	105	P/P	80 - 120
2417441	Vanadium	107	108	P/P	80 - 120
2417441	Zinc	106	106	P/P	80 - 120
2417511	Calcium	108		P	80 - 120
2417511	Iron	110		P	80 - 120
2417511	Magnesium	110		P	80 - 120
2417511	Potassium	107		P	80 - 120
2417511	Sodium	112		P	80 - 120
2417511	Strontium	108		P	80 - 120
2417511	Tin	106		P	80 - 120
2417511	Titanium	106		P	80 - 120
2417511	Vanadium	109		P	80 - 120
2417511	Zinc	109		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P431414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417441	Aluminum	97.7	98.2	P/P	80 - 120
2417441	Antimony	101	102	P/P	80 - 120
2417441	Arsenic	101	101	P/P	80 - 120
2417441	Barium	103	105	P/P	80 - 120
2417441	Beryllium	92.9	94.6	P/P	80 - 120
2417441	Boron	103	105	P/P	80 - 120
2417441	Cadmium	100	102	P/P	80 - 120
2417441	Chromium	94.8	95.0	P/P	80 - 120
2417441	Cobalt	98.6	99.7	P/P	80 - 120
2417441	Copper	101	102	P/P	80 - 120
2417441	Lead	95.1	95.4	P/P	80 - 120
2417441	Manganese	94.9	96.2	P/P	80 - 120
2417441	Molybdenum	100	102	P/P	80 - 120
2417441	Nickel	97.4	98.6	P/P	80 - 120
2417441	Selenium	98.8	99.6	P/P	80 - 120
2417441	Silver	103	106	P/P	80 - 120
2417441	Thallium	103	104	P/P	80 - 120
2417511	Aluminum	99.6		P	80 - 120
2417511	Antimony	101		P	80 - 120
2417511	Arsenic	100		P	80 - 120
2417511	Barium	105		P	80 - 120
2417511	Beryllium	94.1		P	80 - 120
2417511	Boron	106		P	80 - 120
2417511	Cadmium	99.2		P	80 - 120
2417511	Chromium	96.6		P	80 - 120
2417511	Cobalt	101		P	80 - 120
2417511	Copper	102		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P431414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417511	Lead	96.3		P	80 - 120
2417511	Manganese	96.7		P	80 - 120
2417511	Molybdenum	97.9		P	80 - 120
2417511	Nickel	102		P	80 - 120
2417511	Selenium	99.3		P	80 - 120
2417511	Silver	104		P	80 - 120
2417511	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P431682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417496	Chloride	99.0		P	90 - 110
2417639	Chloride	99.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P431685

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417496	Sulfate	93.1		P	90 - 110
2417639	Sulfate	95.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417572	Ammonia-N	98.8	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431661

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417472	Ammonia-N	103	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431648

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417572	Kjeldahl Nitrogen	106	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417572	NO2NO3-N	99.6	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431452

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417576	Total-P	91.8	94.4	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P431591

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417663	Organic Carbon	87.9	91.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P431339

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417571	Color (true)	0.519	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P431349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417573	Turbidity	11.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P431414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417441	Calcium	0.537	Spike	P	0 - 20
2417441	Iron	0.606	Spike	P	0 - 20
2417441	Magnesium	0.780	Spike	P	0 - 20
2417441	Potassium	0.195	Spike	P	0 - 20
2417441	Sodium	0.421	Spike	P	0 - 20
2417441	Strontium	0.00440	Spike	P	0 - 20
2417441	Tin	0.265	Spike	P	0 - 20
2417441	Titanium	2.04	Spike	P	0 - 20
2417441	Vanadium	0.921	Spike	P	0 - 20
2417441	Zinc	0.222	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P431414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417441	Aluminum	0.371	Spike	P	0 - 20
2417441	Antimony	1.22	Spike	P	0 - 20
2417441	Arsenic	0.866	Spike	P	0 - 20
2417441	Barium	0.755	Spike	P	0 - 20
2417441	Beryllium	1.48	Spike	P	0 - 20
2417441	Boron	1.23	Spike	P	0 - 20
2417441	Cadmium	1.24	Spike	P	0 - 20
2417441	Chromium	0.154	Spike	P	0 - 20
2417441	Cobalt	1.13	Spike	P	0 - 20
2417441	Copper	0.741	Spike	P	0 - 20
2417441	Lead	0.328	Spike	P	0 - 20
2417441	Manganese	1.05	Spike	P	0 - 20
2417441	Molybdenum	1.28	Spike	P	0 - 20
2417441	Nickel	1.12	Spike	P	0 - 20
2417441	Selenium	0.832	Spike	P	0 - 20
2417441	Silver	2.13	Spike	P	0 - 20
2417441	Thallium	0.793	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P431682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417496	Chloride	0.711	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P431685

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417496	Sulfate	0.457	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417572	Ammonia-N	2.65	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417472	Ammonia-N	2.41	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431648

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417572	Kjeldahl Nitrogen	1.08	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417572	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417576	Total-P	2.79	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P431796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419627	Total Alkalinity	0.138	Sample	P	0 - 3.9

Quality Assurance Report Precision

Reference Method: SM 2540 C-2015
Batch ID: P431886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417763	TDS	1.35	Sample	P	0 - 10

Reference Method: SM 5310 B-2011
Batch ID: P431591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417663	Organic Carbon	2.81	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: 119977

Included Lab Sample IDs: 2417575, 2417576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	97.6	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A119831

Included Lab Sample IDs: 2417571, 2417573, 2417574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A119833

Included Lab Sample IDs: 2417571, 2417573, 2417574

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119899

Included Lab Sample IDs: 2417599

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.7	98.7	P/P	90 - 110
Antimony	98.5	98.2	P/P	90 - 110
Arsenic	99.5	98.9	P/P	90 - 110
Barium	98.8	97.7	P/P	90 - 110
Beryllium	95.8	97.8	P/P	90 - 110
Boron	101	102	P/P	90 - 110
Cadmium	98.8	98.4	P/P	90 - 110
Chromium	97.7	96.9	P/P	90 - 110
Cobalt	100	99.4	P/P	90 - 110
Copper	98.9	98.2	P/P	90 - 110
Lead	93.3	92.6	P/P	90 - 110
Manganese	98.6	99.0	P/P	90 - 110
Molybdenum	97.8	98.0	P/P	90 - 110
Nickel	99.3	98.2	P/P	90 - 110
Selenium	97.3	100	P/P	90 - 110
Silver	103	101	P/P	90 - 110
Thallium	101	99.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A119904

Included Lab Sample IDs: 2417572

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119917

Included Lab Sample IDs: 2417572, 2417575, 2417576

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119917

Included Lab Sample IDs: 2417572, 2417575, 2417576

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A119927

Included Lab Sample IDs: 2417571, 2417573, 2417574

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

Reference Method: SM 5310 B-2011

Run ID: A119946

Included Lab Sample IDs: 2417572, 2417575, 2417576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.6	97.1	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A119988

Included Lab Sample IDs: 2417571, 2417573, 2417574

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A119992

Included Lab Sample IDs: 2417572, 2417575, 2417576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.5	102	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A120040

Included Lab Sample IDs: 2417571, 2417573, 2417574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	92.1	95.2	P/P	90 - 110
Total Alkalinity	95.3	92.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A120063

Included Lab Sample IDs: 2417599

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	101	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	103	101	P/P	90 - 110
Sodium	104	103	P/P	90 - 110
Strontium	107	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A120063

Included Lab Sample IDs: 2417599

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Tin	105	104	P/P	90 - 110
Titanium	100	99.4	P/P	90 - 110
Vanadium	104	101	P/P	90 - 110
Zinc	104	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120067

Included Lab Sample IDs: 2417572, 2417575, 2417576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	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)	101				0.519	
EPA 180.1 Rev. 2.0	Turbidity	98.7				11.0	
EPA 200.7 Rev. 4.4	Calcium	107	104	108			0.537
	Iron	110	108	107	110		0.606
	Magnesium	110	106	105	110		0.780
	Potassium	107	105	104	107		0.195
	Sodium	106	109	109	112		0.421
	Strontium	108	106	106	108		0.0044
	Tin	108	109	109	106		0.265
	Titanium	107	102	105	106		2.04
	Vanadium	107	107	108	109		0.921
	Zinc	110	106	106	109		0.222
EPA 200.8 Rev. 5.4	Aluminum	99.9	97.7	98.2	99.6		0.371
	Antimony	100	101	102	101		1.22
	Arsenic	101	101	101	100		0.866
	Barium	102	103	105	105		0.755
	Beryllium	94.6	92.9	94.6	94.1		1.48
	Boron	103	103	105	106		1.23
	Cadmium	99.5	100	102	99.2		1.24
	Chromium	97.4	94.8	95.0	96.6		0.154
	Cobalt	101	98.6	99.7	101		1.13
	Copper	102	101	102	102		0.741
	Lead	95.3	95.1	95.4	96.3		0.328
	Manganese	98.1	94.9	96.2	96.7		1.05
	Molybdenum	98.4	100	102	97.9		1.28
	Nickel	102	97.4	98.6	102		1.12
	Selenium	102	98.8	99.6	99.3		0.832
	Silver	104	103	106	104		2.13
	Thallium	102	103	104	103		0.793
EPA 300.0 Rev. 2.1	Chloride	99.9	99.0	99.8		0.711	
	Sulfate	97.6	93.1	95.8		0.457	
EPA 350.1 Rev. 2.0	Ammonia-N	99.8	98.8	102			2.65
	Ammonia-N	96.4	103	99.2			2.41
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	106	104			1.08
EPA 353.2 Rev. 2.0	NO2NO3-N	104	99.6	99.6			0.0
EPA 365.1 Rev. 2.0	Total-P	96.6	91.8	94.4			2.79
SM 2320 B-2011	Total Alkalinity	95.9				0.138	
SM 2540 C-2015	TDS	97.2				1.35	
SM 2540 D-2015	TSS	98.5					
SM 4500-F- C-2011	Fluoride	103					
SM 5310 B-2011	Organic Carbon	95.6	87.9	91.1			2.81

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2417571, 2417573, 2417574
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2417571, 2417573, 2417574
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2417599
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2417599
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2417571, 2417573, 2417574
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2417571, 2417573, 2417574

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2417572, 2417575, 2417576
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2417572, 2417575, 2417576
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2417572, 2417575, 2417576
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2417572, 2417575, 2417576
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2417571, 2417573, 2417574
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2417599
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2417571, 2417573, 2417574
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2417571, 2417573, 2417574
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2417571, 2417573, 2417574
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2417572, 2417575, 2417576

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	06/15/2023			06/15/2023 15:01	Chandler E Cox	2417571
	06/15/2023			06/15/2023 15:02	Chandler E Cox	2417573
	06/15/2023			06/15/2023 15:03	Chandler E Cox	2417574
EPA 180.1 Rev. 2.0	06/15/2023			06/15/2023 13:19	Alexis Price	2417571
	06/15/2023			06/15/2023 13:21	Alexis Price	2417573
	06/15/2023			06/15/2023 13:23	Alexis Price	2417574
EPA 200.7 Rev. 4.4	06/15/2023	06/16/2023 11:55	George D Taylor	06/27/2023 20:00	Samatha Luckman	2417599
EPA 200.8 Rev. 5.4	06/15/2023	06/16/2023 11:55	George D Taylor	06/19/2023 22:41	Emily M Philpot	2417599
EPA 300.0 Rev. 2.1	06/15/2023			06/21/2023 16:46	James L Waggeberby	2417571
	06/15/2023			06/21/2023 17:01	James L Waggeberby	2417573
	06/15/2023			06/21/2023 17:16	James L Waggeberby	2417574
EPA 350.1 Rev. 2.0	06/15/2023			06/16/2023 11:15	Khloe J Berg	2417572
	06/15/2023			06/22/2023 13:54	Ping Hua	2417575
	06/15/2023			06/22/2023 13:55	Ping Hua	2417576
EPA 351.2 Rev. 2.0	06/15/2023	06/22/2023 12:16	Dana G. Hughes	06/23/2023 09:30	Ping Hua	2417572
	06/15/2023	06/22/2023 12:16	Dana G. Hughes	06/23/2023 09:35	Ping Hua	2417575
	06/15/2023	06/22/2023 12:16	Dana G. Hughes	06/23/2023 09:37	Ping Hua	2417576
EPA 353.2 Rev. 2.0	06/15/2023			06/28/2023 10:20	Beverly Y. Sanders	2417572
	06/15/2023			06/28/2023 10:26	Beverly Y. Sanders	2417575
	06/15/2023			06/28/2023 10:27	Beverly Y. Sanders	2417576
EPA 365.1 Rev. 2.0	06/15/2023	06/19/2023 15:25	Adam P Silver	06/20/2023 11:59	James L Waggeberby	2417576
	06/15/2023	06/19/2023 15:25	Adam P Silver	06/20/2023 12:11	James L Waggeberby	2417572
	06/15/2023	06/19/2023 15:25	Adam P Silver	06/20/2023 12:12	James L Waggeberby	2417575
SM 2320 B-2011	06/15/2023			06/26/2023 21:40	Adam P Silver	2417571
	06/15/2023			06/26/2023 21:51	Adam P Silver	2417573
	06/15/2023			06/26/2023 22:47	Adam P Silver	2417574
SM 2340 B-2011	06/15/2023			06/27/2023 20:00	Samatha Luckman	2417599
SM 2540 C-2015	06/15/2023			06/19/2023 14:50	Dana G. Hughes	2417571, 2417573, 2417574
SM 2540 D-2015	06/15/2023			06/19/2023 14:50	Dana G. Hughes	2417571, 2417573, 2417574
SM 4500-F- C-2011	06/15/2023			06/23/2023 01:31	Adam P Silver	2417573
	06/15/2023			06/23/2023 01:57	Adam P Silver	2417571
	06/15/2023			06/23/2023 02:03	Adam P Silver	2417574
SM 5310 B-2011	06/15/2023			06/21/2023 03:24	Elise M. Gillis	2417572
	06/15/2023			06/21/2023 03:54	Elise M. Gillis	2417575
	06/15/2023			06/21/2023 04:09	Elise M. Gillis	2417576