Chemical Analysis Report

NW-DIST-2017-12-22-01

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

Event Description: **Freeport/Bay/Washington run WBID 557 646 567 49E 950**
Request ID: **RQ-2017-11-20-11**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government St
Suite 208A
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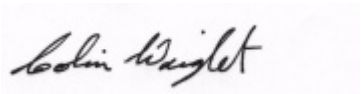
Certified by: Colin Wright, Program Administrator

Date Certified: 12-JAN-2018 10:26



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value and/or the analysis did not meet established quality control criteria.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: OTTER CREEK @ OTTER CREEK BRIDGE RD. Collection Date/Time: 12/21/2017 12:00

Field ID: G3NW0133 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1955909	EPA 350.1 Rev. 2.0	Ammonia-N	1.7		mg N/L	P337717	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P337456	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P337468	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P337479	
	SM 5310 B-00	Organic Carbon	6.7		mg C/L	P337560	
1955910	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P337435	
1955918	EPA 200.7 Rev. 4.4	Calcium	10.6		mg/L	P337447	
		Iron	440		ug/L	P337711	
		Magnesium	2.50		mg/L	P337447	
		Potassium	6.0		mg/L	P337447	
		Sodium	22.9		mg/L	P337447	
		Zinc	5.0	U	ug/L	P337447	
	EPA 200.8 Rev. 5.4	Arsenic	0.35		ug/L	P337447	
		Cadmium	0.020	U	ug/L	P337447	
		Chromium	0.40	U	ug/L	P337447	
		Copper	0.20	U	ug/L	P337447	
		Lead	0.13	I	ug/L	P337447	
		Nickel	0.21	I	ug/L	P337447	
		Silver	0.010	U	ug/L	P337447	

Ref. Method and Comment:
EPA 353.2 Rev. 2.0: NO2NO3-N: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable because of high analyte concentration in the QC sample. Batch matrix spike recoveries for magnesium and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for copper are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: LAFAYETTE CREEK HWY 20 Collection Date/Time: 12/21/2017 13:10

Field ID: G3NW0118 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1955899	EPA 180.1 Rev. 2.0	Turbidity	1.4	A	NTU	P337432	
	EPA 300.0 Rev. 2.1	Chloride	5.0		mg Cl/L	P337530	
		Sulfate	3.2		mg SO4/L	P337534	
	SM 2120 B	Color (true)	35		PCU	P337430	
	SM 2320 B-97	Total Alkalinity	2.4	I	mg CaCO3/L	P337549	
	SM 2540 C-97	TDS	27		mg/L	P337681	
	SM 2540 D-97	TSS	3	I	mg/L	P337677	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P337552	
1955902	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P337716	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.13	I	mg N/L	P337456	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P337468	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P337512	
	SM 5310 B-00	Organic Carbon	2.4		mg C/L	P337608	
1955905	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P337435	

Field ID: G3NW0118 Matrix: W-SURF-FRH

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

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 353.2 Rev. 2.0: NO2NO3-N: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: FOURMILE CREEK SR-20 **Collection Date/Time: 12/21/2017 12:50**

Field ID: G3NW0112 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1955900	EPA 180.1 Rev. 2.0	Turbidity	0.65		NTU	P337432	
	EPA 300.0 Rev. 2.1	Chloride	2.8		mg Cl/L	P337531	
		Sulfate	2.5		mg SO4/L	P337535	
	SM 2120 B	Color (true)	39		PCU	P337430	
	SM 2320 B-97	Total Alkalinity	1.1	I	mg CaCO3/L	P337549	
	SM 2540 C-97	TDS	15	U	mg/L	P337681	
	SM 2540 D-97	TSS	2	I	mg/L	P337677	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P337552	
1955903	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P337716	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.11	I	mg N/L	P337456	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.058		mg N/L	P337468	
	EPA 365.1 Rev. 2.0	Total-P	0.003	I	mg P/L	P337512	
	SM 5310 B-00	Organic Carbon	3.0		mg C/L	P337608	
1955906	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P337435	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 353.2 Rev. 2.0: NO2NO3-N: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: MAGNOLIA CREEK OWLS HEAD RD. **Collection Date/Time: 12/21/2017 13:50**

Field ID: G3NW0099 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1955901	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P337433	
	EPA 300.0 Rev. 2.1	Chloride	2.2		mg Cl/L	P337530	
		Sulfate	2.9		mg SO4/L	P337534	
	SM 2120 B	Color (true)	39	A	PCU	P337430	
	SM 2320 B-97	Total Alkalinity	1.6	I	mg CaCO3/L	P337549	
	SM 2540 C-97	TDS	25		mg/L	P337682	
	SM 2540 D-97	TSS	2	I	mg/L	P337678	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P337552	
1955904	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P337717	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.13	I	mg N/L	P337456	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.069		mg N/L	P337468	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P337512	
	SM 5310 B-00	Organic Carbon	2.9		mg C/L	P337608	
1955907	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P337435	

Field ID: G3NW0099 Matrix: W-SURF-FRH

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

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 353.2 Rev. 2.0: NO2NO3-N: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P337432

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P337433

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337447

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337711

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P337447

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337530

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: P337531

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337534

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337535

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337716

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337717

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337456

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337468

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337479

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337512

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337435

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

Reference Method: SM 2120 B
Batch ID: P337430

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P337549

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

Reference Method: SM 2540 C-97
Batch ID: P337681

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P337682

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P337677

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P337678

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P337552

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P337560

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P337608

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337447

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Magnesium	113		P	85 - 115
Potassium	106		P	85 - 115
Sodium	103		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337711

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P337447

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	98.2		P	85 - 115
Copper	98.6		P	85 - 115
Lead	99.6		P	85 - 115
Nickel	101		P	85 - 115
Silver	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337530

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337531

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337534

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337535

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337716

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337717

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337456

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337468

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337479

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337512

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337435

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

Reference Method: SM 2320 B-97
Batch ID: P337549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 108

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P337552

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.4		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P337560

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.7		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P337608

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.9		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955483	Potassium	112	106	P/P	80 - 120
1955483	Sodium	112	105	P/P	80 - 120
1955483	Zinc	105	98.6	P/P	80 - 120
1955606	Magnesium	113		P	80 - 120
1955606	Potassium	106		P	80 - 120
1955606	Zinc	101		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337711

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955500	Iron	105		P	80 - 120
1956441	Iron	108	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P337447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955483	Arsenic	100	102	P/P	80 - 120
1955483	Cadmium	102	104	P/P	80 - 120
1955483	Chromium	93.9	95.3	P/P	80 - 120
1955483	Copper	91.7	92.6	P/P	80 - 120
1955483	Lead	97.6	99.4	P/P	80 - 120
1955483	Nickel	94.0	95.2	P/P	80 - 120
1955483	Silver	99.9	101	P/P	80 - 120
1955606	Arsenic	105		P	80 - 120
1955606	Cadmium	105		P	80 - 120
1955606	Chromium	95.6		P	80 - 120
1955606	Lead	101		P	80 - 120
1955606	Nickel	95.6		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P337447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955606	Silver	99.9		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955828	Chloride	108		P	90 - 110
1955899	Chloride	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337531

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955900	Chloride	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955828	Sulfate	105		P	90 - 110
1955899	Sulfate	107		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337535

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955832	Sulfate	103		P	90 - 110
1955900	Sulfate	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337716

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955808	Ammonia-N	98.3	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955904	Ammonia-N	102	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337456

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955858	Kjeldahl Nitrogen	110	108	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337479

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955926	Total-P	98.2	98.4	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955902	Total-P	99.4	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955927	O-Phosphate-P	95.8	96.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P337552

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955911	Fluoride	95.0	95.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P337560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1955829	Organic Carbon	96.4	96.6	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P337608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956219	Organic Carbon	95.8	97.3	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P337432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955899	Turbidity	5.67	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P337433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955911	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955483	Calcium	2.95	Spike	P	0 - 20
1955483	Magnesium	4.35	Spike	P	0 - 20
1955483	Potassium	4.90	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955483	Sodium	3.92	Spike	P	0 - 20
1955483	Zinc	5.91	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P337711

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956441	Iron	0.214	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P337447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955483	Arsenic	1.54	Spike	P	0 - 20
1955483	Cadmium	1.93	Spike	P	0 - 20
1955483	Chromium	1.40	Spike	P	0 - 20
1955483	Copper	1.04	Spike	P	0 - 20
1955483	Lead	1.74	Spike	P	0 - 20
1955483	Nickel	1.28	Spike	P	0 - 20
1955483	Silver	0.810	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955828	Chloride	2.66	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955832	Chloride	2.46	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955828	Sulfate	3.27	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337535

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955832	Sulfate	3.07	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337716

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955808	Ammonia-N	2.40	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955904	Ammonia-N	5.60	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955858	Kjeldahl Nitrogen	1.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955902	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955926	Total-P	0.148	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955902	Total-P	1.70	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955927	O-Phosphate-P	0.338	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P337430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955901	Color (true)	0.551	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P337549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955911	Total Alkalinity	0.0960	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P337681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955803	TDS	2.64	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P337682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955925	TDS	3.30	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P337552

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955911	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P337560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1955829	Organic Carbon	0.161	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P337608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956219	Organic Carbon	1.33	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A81101
Included Lab Sample IDs: 1955899, 1955900, 1955901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	98.5	P/P	85 - 115

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A81102
Included Lab Sample IDs: 1955899, 1955900, 1955901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A81103
Included Lab Sample IDs: 1955905, 1955906, 1955907, 1955910

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	97.6	P/P	90 - 110
O-Phosphate-P	99.3	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A81116
Included Lab Sample IDs: 1955902, 1955903, 1955904, 1955909

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A81150
Included Lab Sample IDs: 1955899, 1955900, 1955901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	106	P/P	90 - 110
Chloride	105	105	P/P	90 - 110
Chloride	106	102	P/P	90 - 110
Sulfate	103	103	P/P	90 - 110
Sulfate	105	99.1	P/P	90 - 110
Sulfate	99.1	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A81151
Included Lab Sample IDs: 1955902, 1955903, 1955904, 1955909

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

Reference Method: SM 2320 B-97
Run ID: A81158
Included Lab Sample IDs: 1955899, 1955900, 1955901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A81158
Included Lab Sample IDs: 1955899, 1955900, 1955901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A81160
Included Lab Sample IDs: 1955909

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A81172
Included Lab Sample IDs: 1955918

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.8	98.9	P/P	90 - 110
Cadmium	101	103	P/P	90 - 110
Chromium	96.5	96.9	P/P	90 - 110
Copper	93.4	94.2	P/P	90 - 110
Lead	97.3	97.7	P/P	90 - 110
Nickel	94.0	94.0	P/P	90 - 110
Silver	97.9	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A81173
Included Lab Sample IDs: 1955918

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	106	109	P/P	90 - 110
Magnesium	106	107	P/P	90 - 110
Potassium	104	104	P/P	90 - 110
Sodium	99.7	101	P/P	90 - 110
Zinc	103	105	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A81179
Included Lab Sample IDs: 1955902, 1955903, 1955904

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.1	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A81228
Included Lab Sample IDs: 1955902, 1955903, 1955904, 1955909

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	99.8	P/P	90 - 110
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A81230
Included Lab Sample IDs: 1955902, 1955903, 1955904, 1955909

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110
Ammonia-N	105	105	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A81266
Included Lab Sample IDs: 1955918

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	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		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						5.67	
	Turbidity						0.0	
EPA 200.7 Rev. 4.4	Calcium	109						2.95
	Iron	104	105	108	108			0.214
	Magnesium	113	113					4.35
	Potassium	106	112	106	106			4.90
	Sodium	103	112	105				3.92
	Zinc	102	105	98.6	101			5.91
EPA 200.8 Rev. 5.4	Arsenic	103	100	102	105			1.54
	Cadmium	102	102	104	105			1.93
	Chromium	98.2	93.9	95.3	95.6			1.40
	Copper	98.6	91.7	92.6				1.04
	Lead	99.6	97.6	99.4	101			1.74
	Nickel	101	94.0	95.2	95.6			1.28
	Silver	101	99.9	101	99.9			0.810
EPA 300.0 Rev. 2.1	Chloride	107	108	108			2.66	
	Chloride	106	108				2.46	
	Sulfate	106	105	107			3.27	
	Sulfate	106	103	107			3.07	
EPA 350.1 Rev. 2.0	Ammonia-N	99.9	98.3	101				2.40
	Ammonia-N	97.4	102	108				5.60
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7	110	108				1.45
EPA 353.2 Rev. 2.0	NO2NO3-N	100						0.0
EPA 365.1 Rev. 2.0	Total-P	102	98.2	98.4				0.148
	Total-P	98.4	99.4	97.7				1.70
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	95.8	96.2				0.338
SM 2120 B	Color (true)						0.551	
SM 2320 B-97	Total Alkalinity	101					0.0960	
SM 2540 C-97	TDS						2.64	
	TDS						3.30	
SM 4500 F-C-97	Fluoride	95.4	95.0	95.0				0.0
SM 5310 B-00	Organic Carbon	94.7	96.4	96.6				0.161
	Organic Carbon	96.9	95.8	97.3				1.33

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1955899, 1955900, 1955901
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1955918
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1955918
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1955899, 1955900, 1955901
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1955899, 1955900, 1955901
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1955902, 1955903, 1955904, 1955909
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1955902, 1955903, 1955904, 1955909
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1955902, 1955903, 1955904, 1955909
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1955902, 1955903, 1955904, 1955909
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1955905, 1955906, 1955907, 1955910
SM 2120 B / E31780	True Color measured at 450 nm	1955899, 1955900, 1955901
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1955899, 1955900, 1955901
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1955899, 1955900, 1955901
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1955899, 1955900, 1955901
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1955899, 1955900, 1955901
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1955902, 1955903, 1955904, 1955909

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	12/22/2017			12/22/2017 14:32	DeAsia Armster	1955899, 1955900, 1955901
EPA 200.7 Rev. 4.4	12/22/2017	01/02/2018	Elliott D. Healy	01/03/2018	Betina Topolski	1955918
	12/22/2017	12/26/2017	Elliott D. Healy	12/28/2017	Betina Topolski	1955918
EPA 200.8 Rev. 5.4	12/22/2017	12/26/2017	Elliott D. Healy	12/28/2017	Nadine Brooks	1955918
EPA 300.0 Rev. 2.1	12/22/2017			12/26/2017	Julia Storbeck	1955899
	12/22/2017			12/27/2017	Julia Storbeck	1955900, 1955901
EPA 350.1 Rev. 2.0	12/22/2017			01/02/2018	Sofia Elnemr	1955902, 1955903, 1955904, 1955909
EPA 351.2 Rev. 2.0	12/22/2017	12/26/2017	Adrian Shelby	12/27/2017	Joseph Suarez	1955902, 1955903, 1955904, 1955909
EPA 353.2 Rev. 2.0	12/22/2017			12/26/2017	Beverly Y. Sanders	1955902, 1955903, 1955904, 1955909
EPA 365.1 Rev. 2.0	12/22/2017	12/27/2017	Sima Feizi	01/02/2018	Beverly Y. Sanders	1955902, 1955903, 1955904, 1955909
EPA 365.1 Rev. 2.0 dissolved	12/22/2017			12/22/2017 16:26	Megan Treadwell	1955905
	12/22/2017			12/22/2017 16:27	Megan Treadwell	1955906
	12/22/2017			12/22/2017 16:28	Megan Treadwell	1955907
	12/22/2017			12/22/2017 16:33	Megan Treadwell	1955910
SM 2120 B	12/22/2017			12/22/2017 15:51	Julia Storbeck	1955901
	12/22/2017			12/22/2017 15:52	Julia Storbeck	1955899
	12/22/2017			12/22/2017 15:53	Julia Storbeck	1955900
SM 2320 B-97	12/22/2017			12/27/2017	Dale L. Simmons	1955899, 1955900, 1955901
SM 2540 C-97	12/22/2017			12/27/2017	Yijie Li	1955899, 1955900, 1955901
SM 2540 D-97	12/22/2017			12/27/2017	Yijie Li	1955899, 1955900, 1955901
SM 4500 F-C-97	12/22/2017			12/27/2017	Dale L. Simmons	1955899, 1955900, 1955901
SM 5310 B-00	12/22/2017			12/28/2017	Megan Treadwell	1955902, 1955903, 1955904, 1955909