

Chemical Analysis Report

NW-DIST-2017-10-13-01

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**

Request ID: **RQ-2017-10-09-22**

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: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 06-NOV-2017 14:12



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: Magnolia Creek abv Owl Head's Rd.

Collection Date/Time: 10/12/2017 11:25

Field ID: G3NW0099

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1936810	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P333466	
	EPA 300.0 Rev. 2.1	Chloride	2.3		mg Cl/L	P333468	
		Sulfate	2.1		mg SO4/L	P333469	
	SM 2120 B	Color (true)	50	A	PCU	P333387	
	SM 2320 B-97	Total Alkalinity	1.2	I	mg CaCO3/L	P333739	
	SM 2540 C-97	TDS	16	I	mg/L	P333867	
	SM 2540 D-97	TSS	3	I	mg/L	P333933	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P333742	
1936814	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P333891	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P333733	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P334000	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P333601	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P333687	
1936818	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P333372	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Magnolia Creek abv Owl Head's Rd.

Collection Date/Time: 10/12/2017 11:30

Field ID: G3NW0099DUPLICATE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1936811	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P333466	
	EPA 300.0 Rev. 2.1	Chloride	2.3		mg Cl/L	P333468	
		Sulfate	2.1		mg SO4/L	P333469	
	SM 2120 B	Color (true)	53		PCU	P333388	
	SM 2320 B-97	Total Alkalinity	0.96	I	mg CaCO3/L	P333739	
	SM 2540 C-97	TDS	15	I	mg/L	P333868	
	SM 2540 D-97	TSS	2	I	mg/L	P333934	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P333742	
1936815	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P333617	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P333733	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.064		mg N/L	P334000	
	EPA 365.1 Rev. 2.0	Total-P	0.005		mg P/L	P333601	
	SM 5310 B-00	Organic Carbon	4.1		mg C/L	P333687	
1936819	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P333372	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Magnolia Creek abv Owl Head's Rd.

Collection Date/Time: 10/12/2017 11:35

Field ID: FIELDBLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1936812	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P333466	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P333468	
		Sulfate	0.20	U	mg SO4/L	P333469	

Field ID: FIELDBLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1936812	SM 2120 B	Color (true)	2.5	U	PCU	P333388	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P333739	
	SM 2540 C-97	TDS	15	U	mg/L	P333867	
	SM 2540 D-97	TSS	2	U	mg/L	P333933	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P333742	
1936816	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P333617	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P333731	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P334000	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P333601	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P333687	
1936820	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P333372	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Four Mile Creek abv Hwy 20

Collection Date/Time: 10/12/2017 12:10

Field ID: G3NW0112

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1936813	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P333466	
	EPA 300.0 Rev. 2.1	Chloride	6.7		mg Cl/L	P333468	
		Sulfate	2.3		mg SO4/L	P333469	
	SM 2120 B	Color (true)	58	A	PCU	P333388	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P333739	
	SM 2540 C-97	TDS	24	I	mg/L	P333868	
	SM 2540 D-97	TSS	2	I	mg/L	P333934	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P333742	
1936817	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P333617	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P333733	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.048		mg N/L	P334000	
	EPA 365.1 Rev. 2.0	Total-P	0.005		mg P/L	P333601	
	SM 5310 B-00	Organic Carbon	4.6		mg C/L	P333687	
1936821	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P333373	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Otter Creek @ Otter Creek Bridge Road

Collection Date/Time: 10/12/2017 13:05

Field ID: G3NW0133

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1936807	EPA 180.1 Rev. 2.0	Turbidity	1.7	A	NTU	P333466	
	EPA 300.0 Rev. 2.1	Chloride	34		mg Cl/L	P333468	
		Sulfate	7.0		mg SO4/L	P333469	
	SM 2120 B	Color (true)	190		PCU	P333387	
	SM 2320 B-97	Total Alkalinity	7.9	A	mg CaCO3/L	P333739	
	SM 2540 C-97	TDS	104		mg/L	P333867	
	SM 2540 D-97	TSS	3	I	mg/L	P333933	

Field ID: G3NW0133

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1936807	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P333742	
1936808	EPA 350.1 Rev. 2.0	Ammonia-N	1.1		mg N/L	P333617	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P333731	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P334000	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P333601	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P333687	
1936809	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P333372	
1936833	EPA 200.7 Rev. 4.4	Calcium	7.05		mg/L	P333433	
		Iron	960		ug/L	P333433	
		Magnesium	1.76		mg/L	P333433	
		Potassium	4.0		mg/L	P333433	
		Sodium	16.9		mg/L	P333433	
		Zinc	5.0	U	ug/L	P333433	
	EPA 200.8 Rev. 5.4	Arsenic	0.54		ug/L	P333433	
		Cadmium	0.020	U	ug/L	P333433	
		Chromium	0.42	I	ug/L	P333433	
		Copper	0.31	I	ug/L	P333433	
		Lead	0.28		ug/L	P333433	
		Nickel	0.38	I	ug/L	P333433	
		Silver	0.010	U	ug/L	P333433	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P333466

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P333433

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P333433

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333433

Component	Result	Code	Units
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: P333468

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333469

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333617

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333891

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333731

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333733

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334000

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P333601

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: P333372

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333373

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

Reference Method: SM 2120 B
Batch ID: P333387

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P333388

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P333739

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

Reference Method: SM 2540 C-97
Batch ID: P333867

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P333868

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P333933

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P333934

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P333742

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P333687

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: P333433

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	104		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	99.6		P	85 - 115
Sodium	103		P	85 - 115
Zinc	98.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333433

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	106		P	85 - 115
Chromium	103		P	85 - 115
Copper	98.5		P	85 - 115
Lead	99.6		P	85 - 115
Nickel	101		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333468

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333469

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333617

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333891

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333731

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333733

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334000

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P333601

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333372

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333373

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

Reference Method: SM 2320 B-97
Batch ID: P333739

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P333742

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.0		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P333687

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P333433

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936345	Calcium	102		P	80 - 120
1936345	Iron	97.6		P	80 - 120
1936345	Magnesium	103		P	80 - 120
1936345	Potassium	95.8		P	80 - 120
1936345	Sodium	101		P	80 - 120
1936345	Zinc	98.9		P	80 - 120
1936735	Calcium	109		P	80 - 120
1936735	Iron	108		P	80 - 120
1936735	Magnesium	105	104	P/P	80 - 120
1936735	Potassium	98.2	99.0	P/P	80 - 120
1936735	Sodium	105		P	80 - 120
1936735	Zinc	98.1	99.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333433

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936345	Arsenic	102		P	80 - 120
1936345	Cadmium	107		P	80 - 120
1936345	Chromium	98.9		P	80 - 120
1936345	Copper	97.8		P	80 - 120
1936345	Lead	98.7		P	80 - 120
1936345	Nickel	98.2		P	80 - 120
1936345	Silver	99.2		P	80 - 120
1936735	Arsenic	106	106	P/P	80 - 120
1936735	Cadmium	108	109	P/P	80 - 120
1936735	Chromium	102	103	P/P	80 - 120
1936735	Copper	98.4	99.0	P/P	80 - 120
1936735	Lead	102	102	P/P	80 - 120
1936735	Nickel	101	103	P/P	80 - 120
1936735	Silver	101	115	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936799	Chloride	100		P	90 - 110
1936916	Chloride	102		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936799	Sulfate	98.8		P	90 - 110
1936916	Sulfate	98.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936814	Ammonia-N	99.3	95.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333891

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1937003	Ammonia-N	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333731

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936794	Kjeldahl Nitrogen	97.8	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333733

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936817	Kjeldahl Nitrogen	94.5	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334000

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936802	NO2NO3-N	99.3	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P333601

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936899	Total-P	96.1	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333372

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936804	O-Phosphate-P	91.8	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936821	O-Phosphate-P	95.8	98.9	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P333742

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936807	Fluoride	98.8	99.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P333687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1936801	Organic Carbon	97.0	97.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P333466

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936807	Turbidity	6.90	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P333433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936735	Calcium	0.149	Spike	P	0 - 20
1936735	Iron	0.233	Spike	P	0 - 20
1936735	Magnesium	0.241	Spike	P	0 - 20
1936735	Potassium	0.674	Spike	P	0 - 20
1936735	Sodium	1.15	Spike	P	0 - 20
1936735	Zinc	1.26	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P333433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936735	Arsenic	0.381	Spike	P	0 - 20
1936735	Cadmium	1.03	Spike	P	0 - 20
1936735	Chromium	1.14	Spike	P	0 - 20
1936735	Copper	0.650	Spike	P	0 - 20
1936735	Lead	0.588	Spike	P	0 - 20
1936735	Nickel	1.07	Spike	P	0 - 20
1936735	Silver	12.8	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936799	Chloride	0.533	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P333469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936799	Sulfate	0.539	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936814	Ammonia-N	3.86	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P333891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1937003	Ammonia-N	1.28	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333731

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936794	Kjeldahl Nitrogen	5.83	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P333733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936817	Kjeldahl Nitrogen	3.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334000

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936802	NO2NO3-N	0.966	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P333601

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936899	Total-P	0.0937	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333372

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936804	O-Phosphate-P	4.06	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P333373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936821	O-Phosphate-P	3.18	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P333387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936810	Color (true)	0.0200	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P333388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936813	Color (true)	3.20	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P333739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936807	Total Alkalinity	1.68	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P333867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936798	TDS	6.52	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P333868

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936898	TDS	2.51	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P333742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936807	Fluoride	0.472	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P333687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1936801	Organic Carbon	0.464	Spike	P	0 - 20

Quality Assurance Report Precision

* 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: EPA 365.1 Rev. 2.0 dissolved

Run ID: A79548

Included Lab Sample IDs: 1936809, 1936818, 1936819, 1936820, 1936821

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	91.2	P/P	90 - 110
O-Phosphate-P	99.6	100	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A79554

Included Lab Sample IDs: 1936807, 1936810, 1936811, 1936812, 1936813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115
Color (true)	101	99.4	P/P	85 - 115
Color (true)	94.3	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A79592

Included Lab Sample IDs: 1936807, 1936810, 1936811, 1936812, 1936813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A79593

Included Lab Sample IDs: 1936807, 1936810, 1936811, 1936812, 1936813

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A79619

Included Lab Sample IDs: 1936833

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Iron	102	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	98.5	97.7	P/P	90 - 110
Sodium	100	99.2	P/P	90 - 110
Zinc	97.5	96.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A79639

Included Lab Sample IDs: 1936808, 1936815, 1936816, 1936817

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A79639

Included Lab Sample IDs: 1936808, 1936815, 1936816, 1936817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	P/P	90 - 110
Ammonia-N	102	101	P/P	90 - 110
Ammonia-N	103	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A79650

Included Lab Sample IDs: 1936833

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	105	107	P/P	90 - 110
Cadmium	107	106	P/P	90 - 110
Chromium	105	103	P/P	90 - 110
Copper	103	105	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	102	106	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A79660

Included Lab Sample IDs: 1936808, 1936814, 1936815, 1936816, 1936817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.8	P/P	90 - 110
Organic Carbon	97.8	98.2	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A79678

Included Lab Sample IDs: 1936807, 1936810, 1936811, 1936812, 1936813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	107	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A79678

Included Lab Sample IDs: 1936807, 1936810, 1936811, 1936812, 1936813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A79711

Included Lab Sample IDs: 1936808, 1936814, 1936815, 1936816, 1936817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.8	P/P	90 - 110
Total-P	97.8	97.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A79747

Included Lab Sample IDs: 1936814

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A79762

Included Lab Sample IDs: 1936808, 1936814, 1936815, 1936816, 1936817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	97.2	P/P	90 - 110
Kjeldahl Nitrogen	93.5	94.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A79783

Included Lab Sample IDs: 1936808, 1936814, 1936815, 1936816, 1936817

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

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

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

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						6.90	
EPA 200.7 Rev. 4.4	Calcium	106	102	109				0.149
	Iron	104	97.6	108				0.233
	Magnesium	107	103	105	104			0.241
	Potassium	99.6	95.8	98.2	99.0			0.674
	Sodium	103	101	105				1.15
	Zinc	98.5	98.9	98.1	99.4			1.26
EPA 200.8 Rev. 5.4	Arsenic	102	102	106	106			0.381
	Cadmium	106	107	108	109			1.03
	Chromium	103	98.9	102	103			1.14
	Copper	98.5	97.8	98.4	99.0			0.650
	Lead	99.6	98.7	102	102			0.588
	Nickel	101	98.2	101	103			1.07
	Silver	100	99.2	101	115			12.8
EPA 300.0 Rev. 2.1	Chloride	102	100	102			0.533	
	Sulfate	95.0	98.8	98.1			0.539	
EPA 350.1 Rev. 2.0	Ammonia-N	103	99.3	95.1				3.86
	Ammonia-N	102	104	105				1.28
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.3	97.8	104				5.83
	Kjeldahl Nitrogen	96.3	94.5	98.3				3.44
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.3	100				0.966
EPA 365.1 Rev. 2.0	Total-P	94.4	96.1	96.0				0.0937
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	91.8	95.6				4.06
	O-Phosphate-P	101	95.8	98.9				3.18

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
SM 2120 B	Color (true)				0.0200	
	Color (true)				3.20	
SM 2320 B-97	Total Alkalinity	102			1.68	
SM 2540 C-97	TDS				6.52	
	TDS				2.51	
SM 4500 F-C-97	Fluoride	96.0	98.8 99.3			0.472
SM 5310 B-00	Organic Carbon	98.4	97.0 97.6			0.464

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1936807, 1936810, 1936811, 1936812, 1936813
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1936833
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1936833
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1936807, 1936810, 1936811, 1936812, 1936813
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1936807, 1936810, 1936811, 1936812, 1936813
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1936808, 1936814, 1936815, 1936816, 1936817
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1936808, 1936814, 1936815, 1936816, 1936817
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1936808, 1936814, 1936815, 1936816, 1936817
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1936808, 1936814, 1936815, 1936816, 1936817
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1936809, 1936818, 1936819, 1936820, 1936821
SM 2120 B / E31780	True Color measured at 450 nm	1936807, 1936810, 1936811, 1936812, 1936813
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1936807, 1936810, 1936811, 1936812, 1936813
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1936807, 1936810, 1936811, 1936812, 1936813
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1936807, 1936810, 1936811, 1936812, 1936813
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1936807, 1936810, 1936811, 1936812, 1936813
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1936808, 1936814, 1936815, 1936816, 1936817

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	10/13/2017			10/13/2017 15:53	Blanca Fach	1936807, 1936810, 1936811, 1936812, 1936813
EPA 200.7 Rev. 4.4	10/13/2017	10/16/2017	Elliott D. Healy	10/17/2017	Betina Topolski	1936833
EPA 200.8 Rev. 5.4	10/13/2017	10/16/2017	Elliott D. Healy	10/18/2017	Nadine Brooks	1936833
EPA 300.0 Rev. 2.1	10/13/2017			10/17/2017	Irina Carbone	1936807, 1936810, 1936811, 1936812, 1936813
EPA 350.1 Rev. 2.0	10/13/2017			10/18/2017	Sofia Elnemr	1936808, 1936815, 1936816, 1936817
	10/13/2017			10/23/2017	Sofia Elnemr	1936814
EPA 351.2 Rev. 2.0	10/13/2017	10/20/2017	Adrian Shelby	10/23/2017	Joseph Suarez	1936808, 1936814, 1936815, 1936816, 1936817
EPA 353.2 Rev. 2.0	10/13/2017			10/25/2017	Beverly Y. Sanders	1936808, 1936814, 1936815, 1936816, 1936817
EPA 365.1 Rev. 2.0	10/13/2017	10/18/2017	Sima Feizi	10/20/2017	Lipi Saha	1936808, 1936814, 1936815, 1936816, 1936817
EPA 365.1 Rev. 2.0 dissolved	10/13/2017			10/13/2017 12:58	Megan Treadwell	1936821
	10/13/2017			10/13/2017 13:18	Megan Treadwell	1936809
	10/13/2017			10/13/2017 13:19	Megan Treadwell	1936818
	10/13/2017			10/13/2017 13:20	Megan Treadwell	1936819
	10/13/2017			10/13/2017 13:21	Megan Treadwell	1936820
SM 2120 B	10/13/2017			10/13/2017 16:22	Julia Storbeck	1936810
	10/13/2017			10/13/2017 16:33	Julia Storbeck	1936813
	10/13/2017			10/13/2017 16:34	Julia Storbeck	1936811
	10/13/2017			10/13/2017 16:35	Julia Storbeck	1936812
	10/13/2017			10/13/2017 16:43	Julia Storbeck	1936807
SM 2320 B-97	10/13/2017			10/20/2017	Dale L. Simmons	1936807, 1936810, 1936811, 1936812, 1936813
SM 2540 C-97	10/13/2017			10/18/2017	Yijie Li	1936807, 1936810, 1936811, 1936812, 1936813
SM 2540 D-97	10/13/2017			10/18/2017	Yijie Li	1936807, 1936810, 1936811, 1936812, 1936813
SM 4500 F-C-97	10/13/2017			10/20/2017	Dale L. Simmons	1936807, 1936810, 1936811, 1936812, 1936813
SM 5310 B-00	10/13/2017			10/19/2017	Ping Hua	1936808, 1936814, 1936815, 1936816, 1936817