

Chemical Analysis Report

SO-DIST-2016-08-09-02

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

Event Description: **SMP: Shell Joshua Hog Bay**
Request ID: **RQ-2016-08-08-10**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 29-AUG-2016 14:53



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 group are included in this report: 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: Joshua CR-1.2 MI N. of RT 760A

Collection Date/Time: 08/08/2016 09:50

Field ID: G3SD080816-6

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822495	EPA 180.1 Rev. 2.0	Turbidity	3.9	A	NTU	P309441	
	EPA 300.0 Rev. 2.1	Chloride	26		mg Cl/L	P309869	
		Sulfate	34		mg SO4/L	P309872	
	SM 2120 B	Color (true)	250		PCU	P309417	
	SM 2320 B-97	Total Alkalinity	33		mg CaCO3/L	P309561	
	SM 2540 C-97	TDS	177		mg/L	P309824	
	SM 2540 D-97	TSS	7	I	mg/L	P309765	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P309563	
1822501	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P309490	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P309990	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P309671	
	EPA 365.1 Rev. 2.0	Total-P	0.26		mg P/L	P309698	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P310046	
1822507	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.18		mg P/L	P309426	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Joshua CR-1.2 MI N. of RT 760A-DUP

Collection Date/Time: 08/08/2016 10:00

Field ID: G3SD080816-9

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822496	EPA 180.1 Rev. 2.0	Turbidity	4.2		NTU	P309441	
	EPA 300.0 Rev. 2.1	Chloride	26		mg Cl/L	P309869	
		Sulfate	34		mg SO4/L	P309872	
	SM 2120 B	Color (true)	250		PCU	P309417	
	SM 2320 B-97	Total Alkalinity	33		mg CaCO3/L	P309561	
	SM 2540 C-97	TDS	188		mg/L	P309824	
	SM 2540 D-97	TSS	7	I	mg/L	P309765	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P309563	
1822502	EPA 350.1 Rev. 2.0	Ammonia-N	0.033		mg N/L	P309490	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P309990	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P309671	
	EPA 365.1 Rev. 2.0	Total-P	0.26		mg P/L	P309698	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P310046	
1822508	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.18		mg P/L	P309426	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Hog Bay @ CR 763

Collection Date/Time: 08/08/2016 10:15

Field ID: G3SD080816-7

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822497	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P309441	

Field ID: G3SD080816-7

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822497	EPA 300.0 Rev. 2.1	Chloride	85		mg Cl/L	P309869	
		Sulfate	70		mg SO4/L	P309872	
	SM 2120 B	Color (true)	150		PCU	P309417	
	SM 2320 B-97	Total Alkalinity	124		mg CaCO3/L	P309561	
	SM 2540 C-97	TDS	391		mg/L	P309824	
	SM 2540 D-97	TSS	4	I	mg/L	P309765	
	SM 4500 F-C-97	Fluoride	0.28		mg F/L	P309563	
1822503	EPA 350.1 Rev. 2.0	Ammonia-N	0.11		mg N/L	P309490	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P309740	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.045		mg N/L	P309671	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P309698	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P310047	
1822509	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.14		mg P/L	P309426	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: The result was confirmed on 08/22/2016.

Sample Location: Hog Bay @ CR 763-DUP

Collection Date/Time: 08/08/2016 10:20

Field ID: G3SD080816-10

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822498	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P309441	
	EPA 300.0 Rev. 2.1	Chloride	84		mg Cl/L	P309869	
		Sulfate	73		mg SO4/L	P309872	
	SM 2120 B	Color (true)	150	A	PCU	P309417	
	SM 2320 B-97	Total Alkalinity	124		mg CaCO3/L	P309561	
	SM 2540 C-97	TDS	407		mg/L	P309825	
	SM 2540 D-97	TSS	4	I	mg/L	P309766	
1822504	SM 4500 F-C-97	Fluoride	0.28		mg F/L	P309563	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.11		mg N/L	P309490	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P309740	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.044		mg N/L	P309671	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P309698	
1822510	SM 5310 B-00	Organic Carbon	22		mg C/L	P310047	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.14		mg P/L	P309426	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: The result was confirmed on 08/22/2016.

Sample Location: Shell Cr. @ SR 31

Collection Date/Time: 08/08/2016 11:25

Field ID: G3SD080816-8

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822499	EPA 180.1 Rev. 2.0	Turbidity	5.8		NTU	P309441	
	EPA 300.0 Rev. 2.1	Chloride	72		mg Cl/L	P309869	
		Sulfate	32		mg SO4/L	P309872	

Field ID: G3SD080816-8

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822499	SM 2120 B	Color (true)	140		PCU	P309415	
	SM 2320 B-97	Total Alkalinity	84		mg CaCO3/L	P309562	
	SM 2540 C-97	TDS	314	A	mg/L	P309825	
	SM 2540 D-97	TSS	7	I	mg/L	P309766	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P309564	
1822505	EPA 350.1 Rev. 2.0	Ammonia-N	0.060		mg N/L	P309490	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P309740	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P309671	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P309721	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P310047	
1822511	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.071		mg P/L	P309426	

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: Shell Cr. @ SR 31-DUP

Collection Date/Time: 08/08/2016 11:30

Field ID: G3SD080816-11

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1822500	EPA 180.1 Rev. 2.0	Turbidity	6.0		NTU	P309441	
	EPA 300.0 Rev. 2.1	Chloride	72		mg Cl/L	P309869	
		Sulfate	31		mg SO4/L	P309872	
	SM 2120 B	Color (true)	140		PCU	P309415	
	SM 2320 B-97	Total Alkalinity	84		mg CaCO3/L	P309562	
	SM 2540 C-97	TDS	280		mg/L	P309825	
	SM 2540 D-97	TSS	6	I	mg/L	P309766	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P309564	
1822506	EPA 350.1 Rev. 2.0	Ammonia-N	0.060		mg N/L	P309490	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P309740	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P309671	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P309721	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P310047	
1822512	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.069		mg P/L	P309426	

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: P309441

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P309869

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309869

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309872

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309490

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309740

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309990

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309671

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309698

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309721

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309426

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2120 B
Batch ID: P309415

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P309417

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P309561

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

Reference Method: SM 2320 B-97
Batch ID: P309562

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

Reference Method: SM 2540 C-97
Batch ID: P309824

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P309825

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P309765

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P309766

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P309563

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P309564

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P310046

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

Reference Method: SM 5310 B-00
Batch ID: P310047

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309869

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309490

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309740

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309990

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309671

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309671

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: P309698

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309721

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309426

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

Reference Method: SM 2320 B-97
Batch ID: P309561

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P309562

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P309563

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.3		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P309564

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P310046

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.6		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P310047

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822460	Chloride	97.5		P	90 - 110
1822461	Chloride	94.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822460	Sulfate	93.4		P	90 - 110
1822461	Sulfate	91.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309490

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822611	Ammonia-N	99.0	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309740

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822532	Kjeldahl Nitrogen	97.0	98.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309671

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822501	NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309698

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822503	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309721

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822505	Total-P	104	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822537	O-Phosphate-P	99.7	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P309563

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822434	Fluoride	98.3	99.0	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P309564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822579	Fluoride	98.4	99.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P310046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822244	Organic Carbon	99.5	104	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P310047

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822503	Organic Carbon	102		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P309441

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822495	Turbidity	2.82	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822460	Chloride	0.0560	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822460	Sulfate	0.232	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309490

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822611	Ammonia-N	3.11	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822532	Kjeldahl Nitrogen	1.26	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824050	Kjeldahl Nitrogen	3.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309671

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822501	NO2NO3-N	1.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309698

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822503	Total-P	0.759	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822505	Total-P	0.0378	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822537	O-Phosphate-P	0.400	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P309415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822525	Color (true)	0.484	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P309417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822498	Color (true)	1.43	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P309561

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822434	Total Alkalinity	0.00364	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P309562

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822579	Total Alkalinity	0.0425	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P309824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822434	TDS	4.78	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P309825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822499	TDS	3.18	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P309563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822434	Fluoride	0.509	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P309564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822579	Fluoride	0.979	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P310046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822244	Organic Carbon	2.27	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P310047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1822503	Organic Carbon	0.0967	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: A71020
Included Lab Sample IDs: 1822495, 1822496, 1822497, 1822498, 1822499, 1822500

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.0	96.5	P/P	90 - 115
Color (true)	97.6	100	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71024
Included Lab Sample IDs: 1822507, 1822508, 1822509, 1822510, 1822511, 1822512

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	100	99.3	P/P	90 - 110
O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71025
Included Lab Sample IDs: 1822495, 1822496, 1822497, 1822498, 1822499, 1822500

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71041
Included Lab Sample IDs: 1822501, 1822502, 1822503, 1822504, 1822505, 1822506

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

Reference Method: SM 2320 B-97
Run ID: A71072
Included Lab Sample IDs: 1822495, 1822496, 1822497, 1822498, 1822499, 1822500

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A71072

Included Lab Sample IDs: 1822495, 1822496, 1822497, 1822498, 1822499, 1822500

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	99.5	P/P	90 - 110
Fluoride	99.5	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71097

Included Lab Sample IDs: 1822501, 1822502, 1822503, 1822504, 1822505, 1822506

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71171

Included Lab Sample IDs: 1822501, 1822502, 1822503, 1822504, 1822505, 1822506

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71172

Included Lab Sample IDs: 1822503, 1822504, 1822505, 1822506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.4	96.3	P/P	90 - 110
Kjeldahl Nitrogen	96.3	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71177

Included Lab Sample IDs: 1822495, 1822496, 1822497, 1822498, 1822499, 1822500

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	100	P/P	90 - 110
Chloride	99.8	101	P/P	90 - 110
Sulfate	96.0	96.6	P/P	90 - 110
Sulfate	96.6	95.9	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A71236

Included Lab Sample IDs: 1822501, 1822502, 1822503, 1822504, 1822505, 1822506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	96.1	P/P	90 - 110
Organic Carbon	96.8	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71243

Included Lab Sample IDs: 1822501, 1822502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	99.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

* Pass/Fail determinations are made for each bracketing calibration verification check.
 Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
 Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.82	
EPA 300.0 Rev. 2.1	Chloride	98.9	97.5	94.8		0.0560	
	Sulfate	94.1	93.4	91.2		0.232	
EPA 350.1 Rev. 2.0	Ammonia-N	103	99.0	103			3.11
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	97.0	98.6			1.26
	Kjeldahl Nitrogen	94.8					3.28
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	97.5				1.03
EPA 365.1 Rev. 2.0	Total-P	109	102	101			0.759
	Total-P	107	104	104			0.0378
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	99.7	100			0.400
SM 2120 B	Color (true)					0.484	
	Color (true)					1.43	
SM 2320 B-97	Total Alkalinity	103				0.0036	
	Total Alkalinity	103				0.0425	
SM 2540 C-97	TDS					4.78	
	TDS					3.18	
SM 4500 F-C-97	Fluoride	96.3	98.3	99.0			0.509
	Fluoride	97.7	98.4	99.7			0.979
SM 5310 B-00	Organic Carbon	94.6	99.5	104			2.27
	Organic Carbon	96.0	102				0.0967

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1822501, 1822502, 1822503, 1822504, 1822505, 1822506
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1822501, 1822502, 1822503, 1822504, 1822505, 1822506
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1822501, 1822502, 1822503, 1822504, 1822505, 1822506
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1822501, 1822502, 1822503, 1822504, 1822505, 1822506
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1822507, 1822508, 1822509, 1822510, 1822511, 1822512
SM 2120 B / E31780	True Color measured at 450 nm	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1822495, 1822496, 1822497, 1822498, 1822499, 1822500

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1822501, 1822502, 1822503, 1822504, 1822505, 1822506

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	08/09/2016			08/09/2016 14:10	Sima Feizi	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
EPA 300.0 Rev. 2.1	08/09/2016			08/17/2016	Ping Hua	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
EPA 350.1 Rev. 2.0	08/09/2016			08/09/2016	Julie Michelle Frank	1822501, 1822502, 1822503, 1822504, 1822505, 1822506
EPA 351.2 Rev. 2.0	08/09/2016	08/15/2016	Sofia Elnemr	08/16/2016	Virginia P. Brown	1822503, 1822504, 1822505, 1822506
	08/09/2016	08/19/2016	Sofia Elnemr	08/22/2016	Christopher Armour	1822501, 1822502
EPA 353.2 Rev. 2.0	08/09/2016			08/11/2016	Peter D. Kaus	1822501, 1822502, 1822503, 1822504, 1822505, 1822506
EPA 365.1 Rev. 2.0	08/09/2016	08/15/2016	Vijayalakshmi Reddy	08/16/2016	Lipi Saha	1822501, 1822502, 1822503, 1822504, 1822505, 1822506
EPA 365.1 Rev. 2.0 dissolved	08/09/2016			08/09/2016 14:35	Julia Storbeck	1822508
	08/09/2016			08/09/2016 14:36	Julia Storbeck	1822509
	08/09/2016			08/09/2016 14:37	Julia Storbeck	1822510
	08/09/2016			08/09/2016 14:38	Julia Storbeck	1822511
	08/09/2016			08/09/2016 14:44	Julia Storbeck	1822512
	08/09/2016			08/09/2016 14:59	Julia Storbeck	1822507
SM 2120 B	08/09/2016			08/09/2016 13:13	Rochelle Y Jackson	1822499
	08/09/2016			08/09/2016 13:14	Rochelle Y Jackson	1822500
	08/09/2016			08/09/2016 14:16	Rochelle Y Jackson	1822495, 1822496
	08/09/2016			08/09/2016 14:17	Rochelle Y Jackson	1822497
	08/09/2016			08/09/2016 14:19	Rochelle Y Jackson	1822498
SM 2320 B-97	08/09/2016			08/10/2016	Dale L. Simmons	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 2540 C-97	08/09/2016			08/10/2016	Yijie Li	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 2540 D-97	08/09/2016			08/10/2016	Yijie Li	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 4500 F-C-97	08/09/2016			08/10/2016	Dale L. Simmons	1822495, 1822496, 1822497, 1822498, 1822499, 1822500
SM 5310 B-00	08/09/2016			08/19/2016	Sofia Elnemr	1822501, 1822502, 1822503, 1822504, 1822505, 1822506