

Chemical Analysis Report

WQAP-2017-06-13-03

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

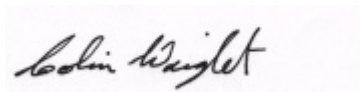
Event Description: **McKay C-kit**
Request ID: **RQ-2017-06-12-40**
Customer: **WQAP**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Tampa, FL 33637
Attn: Judy Ashton

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Certified by: Colin Wright, Program Administrator

Date Certified: 06-JUL-2017 17:43

A handwritten signature in black ink, appearing to read "Colin Wright", is written on a light-colored rectangular background.

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, Nutrients and Pesticides.

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: MCKAY CREEK

Collection Date/Time: 06/12/2017 11:10

Field ID: G5SW0126

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1905712	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P326754	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P327081	
		Sulfate	39		mg SO4/L	P327084	
	SM 2120 B	Color (true)	30		PCU	P326737	
	SM 2320 B-97	Total Alkalinity	131		mg CaCO3/L	P326902	
	SM 2540 C-97	TDS	516		mg/L	P327123	
	SM 2540 D-97	TSS	5	I	mg/L	P327089	
	SM 4500 F-C-97	Fluoride	0.33		mg F/L	P326909	
1905713	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P326812	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P326915	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.093		mg N/L	P326878	
	EPA 365.1 Rev. 2.0	Total-P	0.34		mg P/L	P326921	
	SM 5310 B-00	Organic Carbon	9.1		mg C/L	P326872	
1905714	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.22		mg P/L	P326749	
1905725	EPA 200.7 Rev. 4.4	Calcium	66.3		mg/L	P326830	
		Iron	370		ug/L	P326830	
		Magnesium	13.4		mg/L	P326830	
		Potassium	5.7		mg/L	P326830	
		Sodium	92.1		mg/L	P326830	
	EPA 200.8 Rev. 5.4	Zinc	13	I	ug/L	P326830	
		Arsenic	3.10		ug/L	P326830	
		Cadmium	0.073	I	ug/L	P326830	
		Chromium	1.0	I	ug/L	P326830	
		Copper	6.00		ug/L	P326830	
		Lead	1.75		ug/L	P326830	
		Nickel	0.89		ug/L	P326830	
		Silver	0.010	U	ug/L	P326830	

Ref. Method and Comment:

SM 2540 C-97: The result is consistent with the conductivity measured in the laboratory, 840 umhos/cm.

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

EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 06/27/2017.

Sample Location: MCKAY CREEK

Collection Date/Time: 06/12/2017 11:10

Field ID: G5SW0126

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1905721	EPA 8321B	Sucralose**	2.0		ug/L	P326843	
	USGS O-2060-01	2,4-D	0.019		ug/L	P326684	
		Diuron	0.0033		ug/L	P326684	
		Fenuron	0.0080	U	ug/L	P326684	RPD
		Imidacloprid	0.025		ug/L	P326684	
		Bentazon	0.020		ug/L	P326684	
		Linuron	0.0040	U	ug/L	P326684	
		Acetaminophen**	0.0080	U	ug/L	P326684	
		MCP	0.0080		ug/L	P326684	

Field ID: G5SW0126

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1905721	USGS O-2060-01	Carbamazepine**	0.0034		ug/L	P326684	
		Triclopyr**	0.0040	U	ug/L	P326684	
		Primidone**	0.0098	I	ug/L	P326684	
		Fluridone**	0.32		ug/L	P326684	

Sample Location: MCKAY CREEK DUP

Collection Date/Time: 06/12/2017 11:15

Field ID: G5SW0126

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1905722	EPA 8321B	Sucralose**	2.0		ug/L	P326843	
	USGS O-2060-01	2,4-D	0.019		ug/L	P326755	
		Diuron	0.0032	I	ug/L	P326755	
		Fenuron	0.0080	U	ug/L	P326755	
		Imidacloprid	0.021		ug/L	P326755	MS
		Bentazon	0.021		ug/L	P326755	MS
		Linuron	0.0040	U	ug/L	P326755	
		Acetaminophen**	0.0080	U	ug/L	P326755	
		MCP	0.0077	I	ug/L	P326755	
		Carbamazepine**	0.0036		ug/L	P326755	
		Triclopyr**	0.0040	U	ug/L	P326755	
		Primidone**	0.0089	I	ug/L	P326755	
		Fluridone**	0.32		ug/L	P326755	

Sample Location: BLANK

Collection Date/Time: 06/12/2017 11:20

Field ID: BLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1905723	EPA 8321B	Sucralose**	0.010	U	ug/L	P326843	
	USGS O-2060-01	2,4-D	8.0E-04	U	ug/L	P326755	
		Diuron	8.0E-04	U	ug/L	P326755	
		Fenuron	0.0080	U	ug/L	P326755	
		Imidacloprid	8.0E-04	U	ug/L	P326755	MS
		Bentazon	8.0E-04	U	ug/L	P326755	MS
		Linuron	0.0040	U	ug/L	P326755	
		Acetaminophen**	0.0080	U	ug/L	P326755	
		MCP	0.0020	U	ug/L	P326755	
		Carbamazepine**	4.0E-04	U	ug/L	P326755	
		Triclopyr**	0.0040	U	ug/L	P326755	
		Primidone**	0.0040	U	ug/L	P326755	
		Fluridone**	4.0E-04	U	ug/L	P326755	

**Quality Assurance Report
 Method Blank Results**

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P326754

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326830

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: P326830

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: P327081

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327084

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326812

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326915

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326878

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326921

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326749

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

Reference Method: EPA 8321B
Batch ID: P326843

Component	Result	Code	Units
Sucralose	0.010	U	ug/L

Reference Method: SM 2120 B
Batch ID: P326737

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P326902

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

Reference Method: SM 2540 C-97
Batch ID: P327123

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P327089

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P326909

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P326872

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

Reference Method: USGS O-2060-01
Batch ID: P326684

Component	Result	Code	Units
2,4-D	8.0E-04	U	ug/L
Acetaminophen	0.0080	U	ug/L
Bentazon	8.0E-04	U	ug/L
Carbamazepine	4.0E-04	U	ug/L
Diuron	8.0E-04	U	ug/L
Fenuron	0.0040	U	ug/L
Fluridone	4.0E-04	U	ug/L
Imidacloprid	8.0E-04	U	ug/L
Linuron	0.0040	U	ug/L
MCP	0.0020	U	ug/L
Primidone	0.0040	U	ug/L
Triclopyr	0.0040	U	ug/L

Reference Method: USGS O-2060-01
Batch ID: P326755

Component	Result	Code	Units
2,4-D	8.0E-04	U	ug/L
Acetaminophen	0.0080	U	ug/L
Bentazon	8.0E-04	U	ug/L
Carbamazepine	4.0E-04	U	ug/L
Diuron	8.0E-04	U	ug/L
Fenuron	0.0080	U	ug/L
Fluridone	4.0E-04	U	ug/L
Imidacloprid	8.0E-04	U	ug/L
Linuron	0.0040	U	ug/L
MCP	0.0020	U	ug/L
Primidone	0.0040	U	ug/L
Triclopyr	0.0040	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326830

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	108		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Zinc	101		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P326830

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	98.5		P	85 - 115
Chromium	98.0		P	85 - 115
Copper	95.7		P	85 - 115
Lead	100		P	85 - 115
Nickel	98.5		P	85 - 115
Silver	97.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P327081

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P327084

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P326812

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: P326915

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P326878

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P326921

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P326749

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P326843

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sucralose	79.0		P	40 - 150

Reference Method: SM 2320 B-97
Batch ID: P326902

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

Reference Method: SM 4500 F-C-97
Batch ID: P326909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.8		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P326872

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

Reference Method: USGS O-2060-01
Batch ID: P326684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	75.8		P	40 - 140
Acetaminophen	42.9		P	40 - 140
Bentazon	68.2		P	40 - 140
Carbamazepine	118		P	40 - 140
Diuron	109		P	40 - 140
Fenuron	105		P	40 - 140
Fluridone	108		P	40 - 140
Imidacloprid	96.7		P	40 - 160
Linuron	103		P	40 - 140
MCP	79.6		P	40 - 140
Primidone	100		P	40 - 140
Triclopyr	79.0		P	40 - 140

Reference Method: USGS O-2060-01
Batch ID: P326755

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2,4-D	76.2		P	40 - 140
Acetaminophen	33.1		P	30 - 150
Bentazon	84.8		P	40 - 140
Carbamazepine	121		P	40 - 140
Diuron	112		P	40 - 140
Fenuron	109		P	40 - 140
Fluridone	111		P	40 - 140
Imidacloprid	106		P	40 - 160
Linuron	109		P	40 - 140
MCP	79.8		P	40 - 140
Primidone	99.8		P	40 - 140

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: USGS O-2060-01
 Batch ID: P326755

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Triclopyr	76.0		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P326830

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905489	Calcium	100		P	80 - 120
1905489	Iron	108	107	P/P	80 - 120
1905489	Magnesium	103		P	80 - 120
1905489	Potassium	101		P	80 - 120
1905489	Sodium	98.9		P	80 - 120
1905489	Zinc	100	100	P/P	80 - 120
1905640	Calcium	109		P	80 - 120
1905640	Iron	111		P	80 - 120
1905640	Magnesium	108		P	80 - 120
1905640	Potassium	107		P	80 - 120
1905640	Sodium	107		P	80 - 120
1905640	Zinc	105		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P326830

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905489	Arsenic	109	109	P/P	80 - 120
1905489	Cadmium	106	104	P/P	80 - 120
1905489	Chromium	94.8	94.3	P/P	80 - 120
1905489	Copper	96.2	96.8	P/P	80 - 120
1905489	Lead	105	102	P/P	80 - 120
1905489	Nickel	98.3	98.1	P/P	80 - 120
1905489	Silver	98.5	98.7	P/P	80 - 120
1905640	Arsenic	105		P	80 - 120
1905640	Cadmium	104		P	80 - 120
1905640	Chromium	95.3		P	80 - 120
1905640	Copper	95.5		P	80 - 120
1905640	Lead	102		P	80 - 120
1905640	Nickel	97.1		P	80 - 120
1905640	Silver	98.2		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P327081

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905857	Chloride	99.9		P	90 - 110
1905971	Chloride	97.8		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327084

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905857	Sulfate	97.8		P	90 - 110
1905971	Sulfate	96.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326812

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905535	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905947	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326878

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905537	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326921

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905778	Total-P	93.0	94.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905541	O-Phosphate-P	97.1	97.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P326843

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905633	Sucralose	83.5	82.5	P/P	40 - 150

Reference Method: SM 4500 F-C-97
Batch ID: P326909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905758	Fluoride	98.3	99.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P326872

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905594	Organic Carbon	103		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: USGS O-2060-01
Batch ID: P326684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905398	2,4-D	72.8	74.8	P/P	40 - 140
1905398	Acetaminophen	82.7	72.5	P/P	40 - 140
1905398	Bentazon	56.0	56.0	P/P	40 - 140
1905398	Carbamazepine	137	135	P/P	40 - 140
1905398	Diuron	117	117	P/P	40 - 140
1905398	Fenuron	92.2	64.2	P/P	40 - 140
1905398	Fluridone	117	116	P/P	40 - 140
1905398	Imidacloprid	123	120	P/P	40 - 160
1905398	Linuron	121	123	P/P	40 - 140
1905398	MCP	74.0	78.0	P/P	40 - 140
1905398	Primidone	127	119	P/P	40 - 140
1905398	Triclopyr	72.4	79.8	P/P	40 - 140

Reference Method: USGS O-2060-01
Batch ID: P326755

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1905872	2,4-D	99.0	88.6	P/P	40 - 140
1905872	Acetaminophen	79.8	86.6	P/P	40 - 140
1905872	Bentazon	29.6	24.6	F/F	40 - 140
1905872	Carbamazepine	120	107	P/P	40 - 140
1905872	Diuron	85.1	78.4	P/P	40 - 140
1905872	Fenuron	81.4	77.8	P/P	40 - 140
1905872	Fluridone	80.3	76.1	P/P	40 - 140
1905872	Imidacloprid	189	174	F/F	40 - 160
1905872	Linuron	107	94.8	P/P	40 - 140
1905872	MCP	67.2	62.6	P/P	40 - 140
1905872	Primidone	98.0	91.1	P/P	40 - 140
1905872	Triclopyr	77.2	65.8	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P326754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905675	Turbidity	5.43	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905489	Calcium	1.15	Spike	P	0 - 20
1905489	Iron	0.985	Spike	P	0 - 20
1905489	Magnesium	0.526	Spike	P	0 - 20
1905489	Potassium	0.891	Spike	P	0 - 20
1905489	Sodium	0.605	Spike	P	0 - 20
1905489	Zinc	0.0146	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905489	Arsenic	0.0695	Spike	P	0 - 20
1905489	Cadmium	1.44	Spike	P	0 - 20
1905489	Chromium	0.501	Spike	P	0 - 20
1905489	Copper	0.564	Spike	P	0 - 20
1905489	Lead	2.21	Spike	P	0 - 20
1905489	Nickel	0.194	Spike	P	0 - 20
1905489	Silver	0.247	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905857	Chloride	1.26	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905857	Sulfate	0.0850	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905535	Ammonia-N	0.541	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905947	Kjeldahl Nitrogen	0.0778	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326878

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905537	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905778	Total-P	2.02	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905541	O-Phosphate-P	0.514	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P326843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905633	Sucralose	1.14	Spike	P	0 - 30

Reference Method: SM 2120 B
Batch ID: P326737

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905717	Color (true)	0.405	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P326902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905758	Total Alkalinity	0.769	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P327123

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905717	TDS	4.06	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P326909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905758	Fluoride	0.946	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P326872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905594	Organic Carbon	1.23	Spike	P	0 - 20

Reference Method: USGS O-2060-01
Batch ID: P326684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905398	2,4-D	2.42	Spike	P	0 - 30
1905398	Acetaminophen	13.1	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: USGS O-2060-01
Batch ID: P326684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905398	Bentazon	0.0	Spike	P	0 - 30
1905398	Carbamazepine	1.59	Spike	P	0 - 30
1905398	Diuron	0.135	Spike	P	0 - 30
1905398	Fenuron	35.9	Spike	F	0 - 30
1905398	Fluridone	1.08	Spike	P	0 - 30
1905398	Imidacloprid	2.34	Spike	P	0 - 30
1905398	Linuron	1.83	Spike	P	0 - 30
1905398	MCP	5.26	Spike	P	0 - 30
1905398	Primidone	6.43	Spike	P	0 - 30
1905398	Triclopyr	9.72	Spike	P	0 - 30

Reference Method: USGS O-2060-01
Batch ID: P326755

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1905872	2,4-D	11.1	Spike	P	0 - 30
1905872	Acetaminophen	8.10	Spike	P	0 - 30
1905872	Bentazon	18.5	Spike	P	0 - 30
1905872	Carbamazepine	11.7	Spike	P	0 - 30
1905872	Diuron	8.12	Spike	P	0 - 30
1905872	Fenuron	4.57	Spike	P	0 - 30
1905872	Fluridone	5.35	Spike	P	0 - 30
1905872	Imidacloprid	7.79	Spike	P	0 - 30
1905872	Linuron	11.6	Spike	P	0 - 30
1905872	MCP	7.09	Spike	P	0 - 30
1905872	Primidone	7.30	Spike	P	0 - 30
1905872	Triclopyr	15.9	Spike	P	0 - 30

* 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 Surrogates

Lab Sample ID: 1905721
Field Sample ID: G5SW0126

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	111	P	40 - 160
USGS O-2060-01	2,4-D-d3	84.8	P	40 - 150
USGS O-2060-01	Acetaminophen-d4	113	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	118	P	30 - 160
USGS O-2060-01	Diuron-d6	91.2	P	30 - 160
USGS O-2060-01	Primidone-d5	99.0	P	30 - 150

Lab Sample ID: 1905722
Field Sample ID: G5SW0126

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
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Quality Assurance Report Surrogates

Lab Sample ID: 1905722
Field Sample ID: G5SW0126

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	138	P	40 - 160
USGS O-2060-01	2,4-D-d3	92.6	P	40 - 150
USGS O-2060-01	Acetaminophen-d4	96.3	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	122	P	30 - 160
USGS O-2060-01	Diuron-d6	90.2	P	30 - 160
USGS O-2060-01	Primidone-d5	95.3	P	30 - 150

Lab Sample ID: 1905723
Field Sample ID: BLANK

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Sucralose-d6	120	P	40 - 160
USGS O-2060-01	2,4-D-d3	66.1	P	40 - 150
USGS O-2060-01	Acetaminophen-d4	112	P	30 - 150
USGS O-2060-01	Carbamazepine-d10	119	P	30 - 160
USGS O-2060-01	Diuron-d6	94.7	P	30 - 160
USGS O-2060-01	Primidone-d5	117	P	30 - 150

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A77057
Included Lab Sample IDs: 1905712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.4	99.5	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A77060
Included Lab Sample IDs: 1905714

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A77064
Included Lab Sample IDs: 1905712

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77085
Included Lab Sample IDs: 1905713

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A77100
Included Lab Sample IDs: 1905713

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77102
Included Lab Sample IDs: 1905713

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

Reference Method: SM 2320 B-97
Run ID: A77119
Included Lab Sample IDs: 1905712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A77119
Included Lab Sample IDs: 1905712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	96.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77123
Included Lab Sample IDs: 1905725

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	105	P/P	90 - 110
Iron	103	104	P/P	90 - 110
Magnesium	102	104	P/P	90 - 110
Potassium	99.3	101	P/P	90 - 110
Sodium	101	105	P/P	90 - 110
Zinc	98.4	99.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77124
Included Lab Sample IDs: 1905725

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.2	96.3	P/P	90 - 110
Cadmium	99.0	96.7	P/P	90 - 110
Chromium	96.9	95.6	P/P	90 - 110
Copper	97.9	95.3	P/P	90 - 110
Lead	98.9	98.2	P/P	90 - 110
Nickel	97.7	95.6	P/P	90 - 110
Silver	98.6	97.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A77135

Included Lab Sample IDs: 1905713

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A77178

Included Lab Sample IDs: 1905713

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	108	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A77183

Included Lab Sample IDs: 1905712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.7	100	P/P	90 - 110
Sulfate	98.7	100	P/P	90 - 110

Reference Method: USGS O-2060-01

Run ID: A77208

Included Lab Sample IDs: 1905721, 1905722, 1905723

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
2,4-D	78.0	80.8	P/P	50 - 150
2,4-D	78.4	78.0	P/P	50 - 150
Acetaminophen	94.6	98.4	P/P	60 - 150
Acetaminophen	98.4	101	P/P	60 - 150
Bentazon	94.0	98.0	P/P	50 - 150
Bentazon	98.0	100	P/P	50 - 150
Carbamazepine	108	110	P/P	60 - 150
Carbamazepine	110	109	P/P	60 - 150
Diuron	96.0	99.8	P/P	60 - 150
Diuron	99.3	96.0	P/P	60 - 150
Fenuron	103	102	P/P	60 - 150
Fenuron	98.6	103	P/P	60 - 150
Fluridone	103	103	P/P	60 - 160
Imidacloprid	91.1	97.6	P/P	60 - 150
Imidacloprid	97.6	101	P/P	60 - 150
Linuron	91.0	96.5	P/P	60 - 150
Linuron	96.5	96.2	P/P	60 - 150
MCP	72.8	76.0	P/P	50 - 150
MCP	74.4	72.8	P/P	50 - 150
Primidone	100	91.4	P/P	60 - 150
Primidone	91.4	100	P/P	60 - 150
Triclopyr	76.0	76.4	P/P	50 - 150
Triclopyr	76.4	72.8	P/P	50 - 150

Reference Method: EPA 8321B

Run ID: A77273

Included Lab Sample IDs: 1905721, 1905722, 1905723

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

Reference Method: EPA 8321B

Run ID: A77273

Included Lab Sample IDs: 1905721, 1905722, 1905723

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sucralose	115	114	P/P	60 - 160
Sucralose	134	115	P/P	60 - 160

Reference Method: USGS O-2060-01

Run ID: A77371

Included Lab Sample IDs: 1905721, 1905722

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluridone	106	103	P/P	60 - 160

* 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						5.43	
EPA 200.7 Rev. 4.4	Calcium	104	100	109				1.15
	Iron	108	108	107	111			0.985
	Magnesium	105	103	108				0.526
	Potassium	101	101	107				0.891
	Sodium	102	98.9	107				0.605
	Zinc	101	100	100	105			0.0146
EPA 200.8 Rev. 5.4	Arsenic	100	109	109	105			0.0695
	Cadmium	98.5	106	104	104			1.44
	Chromium	98.0	94.8	94.3	95.3			0.501
	Copper	95.7	96.2	96.8	95.5			0.564
	Lead	100	105	102	102			2.21
	Nickel	98.5	98.3	98.1	97.1			0.194
	Silver	97.0	98.5	98.7	98.2			0.247
EPA 300.0 Rev. 2.1	Chloride	105	99.9	97.8			1.26	
	Sulfate	102	97.8	96.3			0.0850	
EPA 350.1 Rev. 2.0	Ammonia-N	103	102	101				0.541
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	102	102				0.0778
EPA 353.2 Rev. 2.0	NO2NO3-N	108	102	102				0.0
EPA 365.1 Rev. 2.0	Total-P	97.4	93.0	94.9				2.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.6	97.1	97.6				0.514
EPA 8321B	Sucralose	79.0	83.5	82.5				1.14
SM 2120 B	Color (true)						0.405	
SM 2320 B-97	Total Alkalinity	103					0.769	
SM 2540 C-97	TDS						4.06	
SM 4500 F-C-97	Fluoride	95.8	98.3	99.3				0.946
SM 5310 B-00	Organic Carbon	96.4	103					1.23
USGS O-2060-01	2,4-D	75.8	72.8	74.8				2.42
	2,4-D	76.2	99.0	88.6				11.1
	Acetaminophen	42.9	82.7	72.5				13.1
	Acetaminophen	33.1	79.8	86.6				8.10

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision LCS	SMP	MS
USGS O-2060-01	Bentazon	68.2	56.0	56.0			0.0
	Bentazon	84.8	29.6	24.6			18.5
	Carbamazepine	118	137	135			1.59
	Carbamazepine	121	120	107			11.7
	Diuron	109	117	117			0.135
	Diuron	112	85.1	78.4			8.12
	Fenuron	105	92.2	64.2			35.9
	Fenuron	109	81.4	77.8			4.57
	Fluridone	108	117	116			1.08
	Fluridone	111	80.3	76.1			5.35
	Imidacloprid	96.7	123	120			2.34
	Imidacloprid	106	189	174			7.79
	Linuron	103	121	123			1.83
	Linuron	109	107	94.8			11.6
	MCPP	79.6	74.0	78.0			5.26
	MCPP	79.8	67.2	62.6			7.09
	Primidone	100	127	119			6.43
	Primidone	99.8	98.0	91.1			7.30
	Triclopyr	79.0	72.4	79.8			9.72
	Triclopyr	76.0	77.2	65.8			15.9

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1905712
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1905725
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1905725
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1905712
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1905712
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1905713
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1905713
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1905713
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1905713
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1905714
EPA 8321B / E31780	Water soluble organic compounds by HPLC/MS/MS	1905721, 1905722, 1905723
SM 2120 B / E31780	True Color measured at 450 nm	1905712
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1905712
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1905712
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1905712
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1905712
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1905713
USGS O-2060-01 / E31780	Chlorinated (phenoxy acid) herbicides in water matrices by HPLC/MS/MS	1905721, 1905722, 1905723
USGS O-2060-01 / E31780	Urea herbicides and other chemicals in water matrices by HPLC/MS/MS	1905721, 1905722, 1905723

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	06/13/2017			06/13/2017 17:34	Blanca Fach	1905712
EPA 200.7 Rev. 4.4	06/13/2017	06/14/2017	Elliott D. Healy	06/15/2017	Betina Topolski	1905725
EPA 200.8 Rev. 5.4	06/13/2017	06/14/2017	Elliott D. Healy	06/15/2017	Robert K Palmer	1905725
EPA 300.0 Rev. 2.1	06/13/2017			06/20/2017	Julia Storbeck	1905712
EPA 350.1 Rev. 2.0	06/13/2017			06/14/2017	Sofia Elnemr	1905713
EPA 351.2 Rev. 2.0	06/13/2017	06/15/2017	Adrian Shelby	06/19/2017	Joseph Suarez	1905713
EPA 353.2 Rev. 2.0	06/13/2017			06/15/2017	Beverly Y. Sanders	1905713
EPA 365.1 Rev. 2.0	06/13/2017	06/15/2017	Adrian Shelby	06/16/2017	Lipi Saha	1905713
EPA 365.1 Rev. 2.0 dissolved	06/13/2017			06/13/2017 16:37	Anthony C. Onicha	1905714
EPA 8321B	06/13/2017	06/21/2017	Mohammad Ghaffari	06/22/2017	Mohammad Ghaffari	1905721, 1905722, 1905723
SM 2120 B	06/13/2017			06/13/2017 16:18	Tanya Welborn	1905712
SM 2320 B-97	06/13/2017			06/15/2017	Dale L. Simmons	1905712
SM 2540 C-97	06/13/2017			06/14/2017	Yijie Li	1905712
SM 2540 D-97	06/13/2017			06/14/2017	Yijie Li	1905712
SM 4500 F-C-97	06/13/2017			06/15/2017	Dale L. Simmons	1905712
SM 5310 B-00	06/13/2017			06/15/2017	Christopher Armour	1905713
USGS O-2060-01	06/13/2017	06/15/2017	Hoor Shaik	06/18/2017	Juyoung Kim	1905721
	06/13/2017	06/15/2017	Hoor Shaik	06/24/2017	Juyoung Kim	1905721
	06/13/2017	06/16/2017	Hoor Shaik	06/18/2017	Juyoung Kim	1905722, 1905723
	06/13/2017	06/16/2017	Hoor Shaik	06/24/2017	Juyoung Kim	1905722