Data Validation Summary Report
(DVSR ID: TetraTech-M11-2020rev1)
Seep Well Field Area Bioremediation Treatability Study - 2019 Annual Progress Report
Nevada Environmental Response Trust Site
Henderson, Nevada

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LIST OF ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
BW	blank water
CCB	continuing calibration blank
CCV	continuing calibration verification
DL	detection limit
DMC	deuterated monitoring compound
DQO	data quality objectives
DUP	duplicate
DVSR	data validation summary report
EB	equipment blank
EDD	electronic data delivery
FB	field blank
FD	field duplicate
GC-MS	gas chromatography-mass spectroscopy
ICAL	initial calibration
ICB	initial calibration blank
ICS	interference check samples
ICV	initial calibration verification
LCS	laboratory control sample
MDL	method detection limit
MS/MSD	matrix spike/matrix spike duplicate
NORM	normal field sample
NDEP	Nevada Division of Environmental Protection
NERT	Nevada Environmental Response Trust
NFG	National Functional Guidelines
%C	percent completeness
%D	percent difference or drift
%R	percent recovery
%RSD	percent relative standard deviation
PARCCS	precision, accuracy, representativeness, comparability, completeness, sensitivity
PQL	practical quantitation limit
QA	quality assurance
QAPP	quality assurance project plan

Acronyms/Abbreviations	Definition
QC	quality control
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
SDG	sample delivery group
SQL	sample quantitation limit
Tetra Tech	Tetra Tech, Inc.
Treatability Study	Seep Well Field Area Bioremediation Treatability Study
USEPA	United States Environmental Protection Agency
µg/L	micrograms per liter
WG	groundwater
WQ	water quality assurance sample

CERTIFICATION

Data Validation Summary Report Rev 1 Seep Well Field Area Bioremediation Treatability Study - 2019 Annual Progress Report

Nevada Environmental Response Trust Site
(Former Tronox LLC Site)
Henderson, Nevada

Nevada Environmental Response Trust (NERT) Representative Certification
I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

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Date: 7/16/2020

CERTIFICATION

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Description of Services Provided: Prepared Data Validation Summary Report Rev 1 Seep Well Field Area Bioremediation Treatability Study - 2019 Annual Progress Report.

July 16, 2020

Kyle Hansen, CEM
Field Operations Manager/Geologist
Tetra Tech, Inc.

Date

Nevada CEM Certificate Number: 2167
Nevada CEM Expiration Date: September 18, 2020

1.0 INTRODUCTION

On behalf of the Nevada Environmental Response Trust (NERT), Tetra Tech, Inc. (Tetra Tech) has prepared this Data Validation Summary Report (DVSR) to assess the validity and usability of laboratory analytical data from the samples associated with the Seep Well Field Area Bioremediation Treatability Study (Treatability Study) for the NERT site, located in Clark County, Nevada. Sampling protocol can be found in *Final Seep Well Field Area Bioremediation Treatability Study Work Plan* (Tetra Tech, 2016). In 2019 Tetra Tech performed the treatability study extension work described in the NDEP-approved *Treatability/Pilot Study Modification No. 6 – Seep Well Field Area Bioremediation Treatability Study*, which included the collection and analyses of groundwater samples to assess the effectiveness of the ongoing treatability study extension activities and additional quality assurance and quality control (QA/QC) samples to aid in assessing data quality. Tetra Tech collected and validated 322 groundwater, 16 equipment blank, and 16 field blank samples from December 2018 through December 2019 as part of the treatability study extension activities. Additionally, seven groundwater samples were submitted for microbial analyses, but did not require validation.

TestAmerica, Inc. provided laboratory analytical services. The analyses were performed by the methods shown in Table 1. Microbial Insights performed the microbial analyses on 7 groundwater samples. Since microbial data are not validated, they are not included in this DVSR and its tables.

The laboratory assigns job numbers, also called sample delivery groups (SDGs), to all samples. The samples associated with QA/QC are designed to document the data quality of the samples in each sampling round or within an SDG. Table 2 cross-references each validated sample with its laboratory analysis, SDG, collection date, client sample number, laboratory sample number, QC type, matrix, and stage of validation. Samples in Table 2 are submitted in the DVSR electronic data deliverable (EDD) along with associated, unvalidated field readings and microbial data. The EDD contains 361 samples consisting of 322 validated groundwater, 16 validated equipment blanks, 16 validated field blanks, and 7 unvalidated groundwater samples that were sent for microbial analysis only.

The laboratory analytical data were verified and validated in accordance with procedures described in the *Quality Assurance Project Plan, Revision 2* (Ramboll Environ, 2017), *Quality Assurance Project Plan, Revision 3* (Ramboll, 2019), *NDEP Data Verification and Validation Requirements* (NDEP, 2018), and the references contained therein. The samples, all aqueous, were validated to Stage 2A. The review process uses professional judgment and National Functional Guidelines (NFG) guidance to determine the final qualifiers, which are added to the database and presented in the DVSR tables.

The validation checklists are found in Appendix 1. Laboratory data packages may be found in Appendix 2. A database of the analytical results is provided in Appendix 3.

This report summarizes the QA/QC evaluation of the data using precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS) relative to the project data quality objectives (DQOs). This report provides a quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability of the data.

2.0 PRECISION AND ACCURACY OF ENVIRONMENTAL DATA

Environmental data quality depends on sample collection procedures, analytical methods and instrumentation, documentation, and sample matrix properties. Both sampling procedures and laboratory analyses contain potential sources of uncertainty, error, and/or bias, which may affect the overall quality of a measurement. Errors for sample data may result from incomplete equipment decontamination, inappropriate sampling techniques, sample heterogeneity, improper filtering, and improper preservation. The accuracy of analytical results is dependent on selecting appropriate analytical methods, maintaining equipment properly, and complying with QC requirements. The sample matrix also is an important factor in the ability to obtain precise and accurate results within a given medium.

Environmental and laboratory QA/QC samples provide information on the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. Field QA/QC samples include equipment blanks (EBs), field blanks (FBs), field duplicates (FDs), and matrix spike/matrix spike duplicates (MS/MSDs). Laboratory QA/QC samples include method blanks, laboratory control samples (LCSs), laboratory duplicates (DUP), and additional MS/MSDs needed to meet method requirements.

2.1 PRECISION

Precision is a measure of the agreement of analytical results under a given set of conditions. It is a quantity that is not measured directly but is calculated from concentrations. Precision can be expressed as the relative percent difference (RPD) between two measurements:

$$RPD = \frac{(C1 - C2)*100}{(C1 + C2)/2}$$

where:
C1 = reported concentration for the sample
C2 = reported concentration for the duplicate

Precision can be expressed as the percent relative standard deviation (%RSD) between three or more measurements:

$$\%RSD = (s/\bar{a})*100$$

where:
%RSD = percent relative standard deviation
s = standard deviation
$\bar{a}$ = mean of replicate analyses

Precision is assessed by calculating %RSD during an initial calibration (ICAL) and RPD from the percent recoveries of the spiked compounds for each sample in the MS/MSD pair. In the absence of an MS/MSD pair, a laboratory duplicate can be analyzed as an alternative means of assessing precision. An additional measure of sampling precision is obtained by collecting and analyzing FD samples, which are compared using the RPD results as the evaluation criteria.

MS and MSD samples are field samples which have been spiked by the laboratory with target analytes prior to preparation and analysis. These samples measure the appropriateness of the analytical method and effectiveness in recovering target analytes from a specific environmental matrix. The LCS sample is spiked with the same target analytes as the MS/MSD using an interference-free matrix instead of a field sample aliquot. The LCS measures laboratory efficiency in recovering target analytes in the absence of matrix interferences. It is used to verify that the analyses are being performed in control.

The laboratory analyzes laboratory replicates. A field sample is analyzed and an unspiked duplicate of that sample is also analyzed. The data reviewer compares the reported results of the primary analysis and the laboratory duplicate and calculates RPDs to assess laboratory precision.

Calibration precision is determined by calculating %RSD. Laboratory and field sampling precision are evaluated by calculating RPDs for field sample duplicate pairs, if collected. The sampler collects two field samples at the same location and under identical conditions. The laboratory then analyzes the samples under identical conditions.

An RPD outside the allowed limit between MS/MSD samples or DUP samples indicates imprecision. Imprecision is the variance in the consistency with which the laboratory arrives at a reported result. The actual analyte concentration may be higher or lower than the reported result.

Possible causes of poor precision include sample heterogeneity, sample matrix interference, improper sample collection or handling, inconsistent sample preparation, instrument column fouling, and poor instrument stability. In duplicate pairs, results may be reported in either the primary or duplicate samples at levels below the practical quantitation limit (PQL) or non-detected. Since these values are estimated, RPD exceedances from these duplicate pairs do not suggest a significant impact to data quality.

2.2 ACCURACY

Accuracy is a measure of the closeness of agreement between a measured value and the true value of an analytical parameter. It may be used to identify bias in each measurement system. Recoveries outside acceptable QC limits may be caused by factors such as instrumentation, analyst error, or matrix interference. Accuracy is assessed through the analysis of continuing calibrations, MS, MSD, LCS, and surrogates. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples. Accuracy is determined using the percent recovery (%R) of MS and LCS analyses.

Percent recovery is calculated using the following equation:

$$\%R = (A-B)/C \times 100$$

where:
A = measured concentration in the spiked sample
B = measured native concentration in the unspiked sample
C = concentration of the spike

The percent recovery of each analyte spiked in MS/MSD samples and LCS is evaluated with the acceptance criteria specified by the QAPPs and laboratory limits. Spike recoveries outside the acceptable QC accuracy limits provide an indication of bias, where the reported data may overestimate or underestimate the actual concentration of compounds detected or quantitation limits reported for environmental samples.

2.3 REPRESENTATIVENESS

Representativeness is a qualitative parameter that expresses the degree to which the sample data are characteristic of a population. It is evaluated by reviewing the QC results of blanks, samples, and holding times. Positive detects of compounds in the blank samples identify compounds that may have been introduced into the samples during sample collection, transport, preparation, or analysis. The QA/QC blanks collected and analyzed are method blanks, calibration blanks, EBs, and FBs.

A method blank is a laboratory grade water or solid matrix that contains the method reagents and has undergone the same preparation and analysis as the environmental samples. The method blank provides a measure of the combined contamination derived from the laboratory source water, glassware, instruments, reagents, and sample

preparation steps. Method blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

Several methods require the use of initial calibration blanks (ICBs) and continuing calibration blanks (CCBs). ICBs and CCBs are laboratory-grade water samples that are analyzed at the beginning, during, and at the end of sample analysis runs. The frequency is dependent on the analytical method. These blanks estimate residual contaminants from the previous sample or standards analysis and measure baseline shifts that commonly occur in emission and absorption spectroscopy.

EBs consist of analyte-free water poured over or through the sample collection equipment. The water is collected in a sample container for laboratory analysis. These blanks are collected after the sampling equipment is decontaminated; they are used to measure effectiveness of the decontamination procedure. Equipment blanks are collected and analyzed for all target analytes.

FBs consist of analyte-free source water stored at the sample collection site. The water is collected from each source water used during each sampling event. Field blanks were collected and analyzed for all target analytes.

Contaminants found in both the environmental sample and the blank sample are assumed to be laboratory artifacts if both values are less than the PQL or if a sample result and blank contaminant value are greater than the PQL and the sample result is less than 10 times the blank contaminant value.

Holding times are evaluated to assure that the sample integrity is intact for accurate sample preparation and analysis. Holding times are specific for each method and matrix analyzed. Holding time exceedance can cause loss of sample constituents due to biodegradation, precipitation, volatilization, and chemical degradation. Sample results for analyses that were performed after the method holding time are qualified according to NDEP requirements using the qualifiers and bias recommendations found in the NFGs.

2.4 COMPARABILITY

Comparability is a qualitative characteristic that defines the extent to which the data for a chemical parameter measurement are consistent with, and may be compared with, data from other sampling events. Comparability is dependent upon the design of the sampling plans and execution of activities consistent with approved plans. Factors affecting comparability include sample collection and handling techniques, matrix type, and analytical method. Comparability is achieved through the use of standard techniques to collect representative samples, consistent application of analytical method protocols, and use of appropriate units in reporting analytical results. Comparability is also dependent upon other PARCCS criteria, because only when precision, accuracy, and representativeness are known can datasets be compared with confidence.

2.5 COMPLETENESS

Completeness is defined as the percentage of acceptable sample results compared to the total number of sample results. Completeness is evaluated to determine if an acceptable amount of usable data were obtained so that a valid scientific site assessment can be completed. Completeness equals the total number of sample results for each fraction minus the total number of rejected sample results divided by the total number of sample results multiplied by 100. As specified in the project DQOs, the goal for completeness for target analytes in each analytical fraction is 90 percent.

Percent completeness is calculated using the following equation:

$$\%C = (T - R)/T \times 100$$

where:
%C = percent completeness
T = total number of sample results
R = total number of rejected sample results

Completeness is also determined by comparing the planned number of samples per method and matrix as specified in the QAPPs, with the number determined above. In cases where multiple results are reported for a single analyte due to dilutions or re-analysis using a single method, the most technically sound value will be reported, and the other result will be qualified “R”. Data rejected in favor of alternate results are not used in the completion calculation.

2.6 SENSITIVITY

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. It is generally used to describe the instrument detection limits (DLs) or PQLs established to meet project DQOs. The method detection limit (MDL) represents the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. Sample quantitation limits (SQLs) are adjusted MDL values that reflect sample-specific actions, such as dilutions or varying aliquot sizes. The laboratory data reports show MDL in place of the SQL. The MDL was adjusted to reflect the sample analysis conditions. The PQL is the minimum concentration that can be reported based on the analysis of a specific matrix. The PQL is often the lowest acceptable calibration point for the analyte.

For this project, the laboratory data reports show reporting limit (RL) in place of the PQL. The laboratory reported detected analytes down to the adjusted MDL/SQL. All results reported between the SQL and PQL were qualified “J” by the laboratory. Sample results are compared to method and field quality blank results to identify possible effects of laboratory background and field procedures on sensitivity.

3.0 VALIDATION RESULTS AND PARCCS

This section discusses the validation results and the associated PARCCS criteria. Before conducting the PARCCS evaluation, the analytical data were validated to Stage 2A.

Samples not meeting the acceptance criteria were denoted with a validation qualifier that indicates a deficiency with the data. Table 3 contains validation qualifiers used in data validation.

When more than one validation qualifier is applicable to a data point, the final validation qualifier applied is based on the following hierarchy:

R > J	R takes precedence over the J qualifier.
J+	The high bias (J+) qualifier is applied to detected results only.
J > J+ or J-	The unbiased (J) qualifier supersedes biased (J+ or J-) qualifiers since it is not possible to assess the direction of the potential bias.
J = J+ plus J-	Adding biased (J+ or J-) qualifiers with opposite signs results in an unbiased qualifier (J).
UJ = U plus J	The UJ qualifier is used when a non-detected (U) flag is added to a (J) flag.

Table 4 identifies the QC elements reviewed for Stage 2A validation. The actual elements are method-dependent.

Table 5 lists the reason codes used. Reason codes explain why data were qualified and identify possible limitations of data use. Reason codes are cumulative except when one of the flags is R. In that case, only the reason code associated with the R flag is used.

Table 6 presents the overall qualified results after the validation qualifiers and associated reason codes were applied.

3.1 PRECISION

3.1.1 Instrument Calibration

The objective of the ICAL is to ensure that an instrument can produce acceptable qualitative and quantitative data by determining the ratio of instrument response to analyte concentration. %RSD is used to evaluate ICAL results in RSK-175 and provides a means of evaluating precision within an analytical system.

ICAL data are not reviewed during Stage 2A validation.

3.1.2 MS/MSD and Laboratory Duplicate Samples

No data were qualified for MS/MSD or lab duplicate RPD outliers.

3.1.3 Field Duplicate Samples

For results > 5X the PQL, the FDs were evaluated for acceptable precision with RPDs. For waters, the allowable RPD is 30%. For results < 5X the PQL, samples were evaluated by the difference between the two measurements. Table 7 only includes results where the difference between the values was greater than the absolute value of the PQL because RPD criteria were met. Four results were qualified for FD imprecision. Results qualified for FD imprecision are found in Table 6 with reason code “fd”. The parent sample and the FD were qualified “J” for detects and “UJ” for non-detects.

3.2 ACCURACY

3.2.1 Calibration and Continuing Calibration

As stated previously, the objective of initial calibration is to ensure that an instrument is capable of producing acceptable qualitative and quantitative data by determining the ratio of instrument response to analyte concentrations. Typically, inorganic methods use regression models for initial calibration. Regression may also be used in organic analyses. The correlation coefficient indicates the linearity of the calibration curve. The coefficient of determination is an overall measure of the accuracy of the regression calibration curve. The objective of continuing calibration is to ensure that the instrument continues to meet the sensitivity and linearity criteria throughout each analytical sequence. Initial and continuing calibration verification (CCV) results provide a means of evaluating accuracy. Percent difference or drift (%D), percent recovery (%R), correlation coefficient, and coefficient of determination are the parameters used to measure the effectiveness of instrument calibration. %R and %D are used to verify the ongoing calibration acceptability of the analytical system.

Calibration data are not reviewed during Stage 2A validation.

3.2.2 MS/MSD Samples

Several MS/MSD %Rs were outside of acceptance criteria shown in the QAPPs. MS/MSD %R exceedances can be found in Table 8. Analytes that were present in the parent sample in concentrations greater than 4 times the amount spiked were not qualified and are not shown in the table. In cases where the recoveries were high and the parent sample was non-detect, no qualification was applied. Qualifiers were applied to parent samples only, unless FD samples or samples of known similarity were analyzed in the same SDG. Table 8 contains the spiked parent sample only. Per the inorganic NFG, MS/MSD recoveries < 30 percent result in rejection of the non-detected data point. In cases where dilutions caused the low recoveries, the data were not rejected or qualified. The effect of dilution on matrix spike recoveries is determined on a case-by-case-basis using professional judgment, knowledge of the lab's procedures, and input from the lab. For some analyses, the lab may dilute the sample prior to preparation for analyses and prior to addition of the matrix spike compounds. The lab also approaches this on a case-by-case basis. Chlorate recoveries were low in the MS/MSD of SWFTS-MW06A-EM20 and within limits in the MS/MSD of the field duplicate of that sample. The parent concentration is greater than the FD concentration even though the MS/MSD recoveries are low. Using professional judgment, the validator qualified SWFTS-MW06A-EM20 and SWFTS-MW06A-EM20-FD "J", with no bias, because of conflicting MS/MSD results. Eleven results were qualified for MS/MSD %Rs. The results qualified for MS/MSD recoveries can be found in Table 6 with reason code "m."

3.2.3 LCS Samples

No data were qualified for LCS %R outliers.

3.2.4 Serial Dilutions

The serial dilution is used to determine whether physical or chemical interferences exist due to matrix. Most serial dilution %Ds were less than 10 percent as required in the inorganic NFG. Four SW-6010B results were qualified for high %Ds in the serial dilution. Associated results qualified for serial dilution %Ds can be found in Table 6 with reason code "sd." Serial dilution %D exceedances can be found in Table 9.

3.2.5 Interference Check Samples

Interference check samples (ICS) are analyzed in the following methods: EPA 314.0, SW-6010B, and SW-6020A. All interference check %Rs met acceptance criteria of 80 to 120 percent.

3.2.6 Surrogates

Surrogates are added to all samples analyzed by EPA 300.1B to measure the efficiency of the analytical method. The acceptance limits are 90 to 115 percent. No results were qualified for surrogate %Rs.

3.2.7 Analyte Quantitation and Target Identification

Fifty-six sulfate results and one perchlorate result exceeded the calibration range of the instrument and were re-analyzed by the lab. The original results were assigned a validation qualifier “R” and are shown with reason code “brr” in Table 6. The most technically sound results were used. The rejected results are shown in Table 10 with a comment describing the logic for using the alternate result. Data rejected in favor of alternate results such as dilution runs are not used in the completion calculation.

Seventeen nitrate analyses were run at multiple dilutions because of high concentrations of sulfate. They were also assigned a validation qualifier “R” and are shown with reason code “brr” in Table 6. They are discussed further in Section 3.6.

3.3 REPRESENTATIVENESS

3.3.1 Sample Preservation and Holding Times

Sample preservation, including temperature, and holding times were evaluated to verify compliance with the analytical methods.

Sixty-seven results were qualified for preservation. Results qualified for preservation are designated with reason code “pH” in Table 6.

Of those, two TOC results were also qualified for holding time infractions. They were designated with reason codes “h, pH” in Table 6. The samples were collected in bottles containing HCl, but when checked, the pH was >2. The lab adjusted the pH of the samples to pH < 2 prior to analysis. Since the samples were not analyzed within the 4-hour holding time for unpreserved samples, the holding time was grossly exceeded. The two TOC results were qualified “J-“ in validation.

Three methane results were also qualified for improper preservation and holding time and designated with reason codes “h, pH” in Table 6. The samples were collected in bottles containing HCl, but when checked, the pH was >2. The samples were not analyzed within the 7-day holding time for unpreserved samples. The methane results were qualified “UJ“ for non-detects and “J” for the detection. Bias was not applied to the detection because it is not known.

Sixty-two metals results were qualified because they were not preserved to pH < 2. The lab adjusted the samples with nitric acid to pH < 2 prior to analysis.

A total of 18 results were qualified for holding time, including the TOCs and methane results mentioned above. Results with holding time infractions are designated with reason code “h” in Table 6.

The preservation exceedances are shown in Table 11. The holding time exceedances are shown in Table 12.

3.3.2 Blanks

Method blanks, ICBs, CCBs, EBs, and FBs were analyzed to evaluate representativeness. The concentration of an analyte in any blank was used for data qualification. If contaminants were detected in a blank, the blank concentration was compared to the sample results. If the analyte was not detected in the sample, no qualification was applied to the sample. If the sample concentration was greater than 10 times the amount in the blank, after dilutions were considered, no qualification was applied.

For concentrations detected in the sample below the PQL, the sample result was qualified "J". Based on hierarchy of validation qualification, the "J" qualifier, in this case applied to detected results below the PQL, supersedes the positive bias associated with blank contamination. For concentrations detected in the sample above the PQL and less than 10 times the amount in the blank, the sample result was qualified "J+".

3.3.2.1 Method and Calibration Blanks

Several inorganic analytes were detected in the method and calibration blanks. Calibration blanks are not usually evaluated in Stage 2A validation; however, the case narrative mentioned the presence of target analytes in calibration blanks. The calibration blanks mentioned in the narratives were reviewed by the validator.

Sixty-five sample results were qualified because of analytes found in both the samples and the lab blanks. Qualified results are shown in Table 6 with reason codes "bl." Laboratory blank detections that resulted in qualification are shown in Table 13.

3.3.2.2 Equipment Blanks and Field Blanks

There were several detections in the EBs and FBs. Thirty results were qualified because of EB detections. The qualified results are shown in Table 6 with reason code "be." Twenty-one results were qualified because of FB detections. Qualified results are shown in Table 6 with reason code "bf."

EB and FB detections that resulted in qualification are shown in Table 14 with the associated samples. EBs and FBs may not appear in the same SDG as their associated samples.

3.4 COMPARABILITY

The laboratory used standard analytical methods for all analyses. In all cases, the SQLs attained were at or below the PQLs. Target compounds detected below the PQLs were flagged "J" by the laboratory and should be considered estimated. All 212 results detected between the SQL and PQL are shown with reason code "sp" in Table 6. The comparability of the data is acceptable.

3.5 COMPLETENESS

The overall completeness level attained for the field samples, EBs, and FBs is 100 percent and meets the project goal of 90 percent. The percentage was calculated as the total number of accepted (non-rejected) sample results divided by the total number of sample results multiplied by 100. Completeness by method is presented in Table 15. Data rejected in favor of alternate results such as dilution runs are not used in the completion calculation.

3.6 SENSITIVITY

The calibrations were evaluated for instrument sensitivity and were determined to be technically acceptable. Due to high analyte concentrations, many analytical runs were analyzed at dilutions. For diluted analyses, SQLs and PQLs were elevated. Several nitrate analyses were run at multiple dilutions because of high concentrations of sulfate. The most technically sound result was used. Typically, where multiple non-detected results were

reported, and quality control criteria were comparable, the result with the lowest PQL was used. Where multiple detected results were reported, and quality control criteria were comparable, the result with the highest concentration was used. Unused results were assigned a validation qualifier “R” and are shown with reason code “brr” in Table 6. The unused results are shown in Table 10 with a comment describing the logic for using the alternate result. Data rejected in favor of alternate results such as dilution runs are not used in the completion calculation.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Data were qualified for issues affecting precision, accuracy, representativeness, and comparability. No results were rejected for quality issues. Multiple runs were analyzed for samples with high analyte concentrations. The most technically sound results were used.

The analytical data quality assessment for the analytical results generated during the Seep Well Field Area Bioremediation Treatability Study at the NERT site in Henderson, Nevada, established that the overall project requirements and completeness levels were met.

5.0 REFERENCES

Nevada Division of Environmental Protection (NDEP). (2018). *NDEP Data Verification and Validation Requirements*.

Ramboll Environ. (2017). *Quality Assurance Project Plan, Revision 2, Nevada Environmental Response Trust Site, Henderson, Nevada.*

Ramboll. (2019). *Quality Assurance Project Plan, Revision 3, Nevada Environmental Response Trust Site, Henderson, Nevada.*

Tetra Tech. (2016). *Final Seep Well Field Area Bioremediation Treatability Study Work Plan.*

Tables

Table 1 Analytical Methods

Method	Parameters	Number of Water Samples	Number of Soil Samples
EPA 300.0	Nitrate [as N]	354	0
EPA 300.0	Sulfate	354	0
EPA 300.1B	Chlorate	354	0
EPA 314.0	Perchlorate	354	0
RSK175	Methane	46	0
SM5310B	Total Organic Carbon	354	0
SW-6010B	Dissolved Metals*	90	0
SW-6010B	Total Manganese	90	0
SW-6020A	Dissolved Antimony, Arsenic, Selenium, Thallium	90	0

*Dissolved metals include aluminum, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, phosphorus, potassium, silicon, silver, sodium, strontium, tin, titanium, tungsten, vanadium, zinc

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-228394-1	SWFTS-MW16-EM16	440-228394-1	WG	NORM	12/19/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW15-EM16	440-228491-1	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW14-EM16	440-228491-2	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW02-EM16	440-228491-3	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	PC-91-EM16	440-228491-4	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	PC-92-EM16	440-228491-5	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW10A-EM16	440-228491-6	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW20-EM16	440-228491-7	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW18-EM16	440-228491-8	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-20181220-EB	440-228491-9	BW	EB	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-20181220-FB	440-228491-10	BW	FB	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW05A-EM16	440-228491-11	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW05B-EM16	440-228491-12	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228491-1	SWFTS-MW21-EM16	440-228491-13	WG	NORM	12/20/18	Stage 2A	X	X	X		X			
440-228818-1	SWFTS-MW01-EM16	440-228818-1	WG	NORM	12/27/18	Stage 2A	X	X	X		X			
440-228818-1	SWFTS-MW22-EM16	440-228818-2	WG	NORM	12/27/18	Stage 2A	X	X	X		X			
440-228818-1	SWFTS-MW19-EM16	440-228818-3	WG	NORM	12/27/18	Stage 2A	X	X	X		X			
440-228818-1	SWFTS-MW19-EM16-FD	440-228818-4	WG	FD	12/27/18	Stage 2A	X	X	X		X			
440-228818-1	SWFTS-MW09A-EM16	440-228818-5	WG	NORM	12/27/18	Stage 2A	X	X	X		X			
440-228887-1	SWFTS-MW09B-EM16	440-228887-1	WG	NORM	12/28/18	Stage 2A	X	X	X		X			
440-228887-1	PC-94-EM16	440-228887-2	WG	NORM	12/28/18	Stage 2A	X	X	X		X			
440-228887-1	SWFTS-MW06A-EM16	440-228887-3	WG	NORM	12/28/18	Stage 2A	X	X	X		X			
440-228887-1	SWFTS-MW06A-EM16-FD	440-228887-4	WG	FD	12/28/18	Stage 2A	X	X	X		X			
440-228887-1	SWFTS-MW06B-EM16	440-228887-5	WG	NORM	12/28/18	Stage 2A	X	X	X		X			
440-228887-1	SWFTS-MW23-EM16	440-228887-6	WG	NORM	12/28/18	Stage 2A	X	X	X		X			
440-228887-1	SWFTS-20181228-EB	440-228887-7	BW	EB	12/28/18	Stage 2A	X	X	X		X			
440-228887-1	SWFTS-20181228-FB	440-228887-8	BW	FB	12/28/18	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW25-EM16	440-229018-1	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW24-EM16	440-229018-2	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW03-EM16	440-229018-3	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW08A-EM16	440-229018-4	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW17-EM16	440-229018-5	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW13-EM16	440-229018-6	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW12-EM16	440-229018-7	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW11-EM16	440-229018-8	WG	NORM	01/02/19	Stage 2A	X	X	X		X			

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-229018-1	SWFTS-MW11-EM16-FD	440-229018-9	WG	FD	01/02/19	Stage 2A	X	X	X		X			
440-229018-1	SWFTS-MW07A-EM16	440-229018-10	WG	NORM	01/02/19	Stage 2A	X	X	X		X			
440-229111-1	SWFTS-MW07B-EM16	440-229111-1	WG	NORM	01/03/19	Stage 2A	X	X	X		X			
440-229111-1	SWFTS-MW04-EM16	440-229111-2	WG	NORM	01/03/19	Stage 2A	X	X	X		X			
440-229111-1	PC-97-EM16	440-229111-3	WG	NORM	01/03/19	Stage 2A	X	X	X		X			
440-229111-1	COH-2B1-EM16	440-229111-4	WG	NORM	01/03/19	Stage 2A	X	X	X		X			
440-229111-1	PC-88-EM16	440-229111-5	WG	NORM	01/03/19	Stage 2A	X	X	X		X			
440-229111-1	PC-88-EM16-FD	440-229111-6	WG	FD	01/03/19	Stage 2A	X	X	X		X			
440-229111-1	PC-58-EM16	440-229111-7	WG	NORM	01/03/19	Stage 2A	X	X	X		X			
440-234705-1	SWFTS-MW15-EM17	440-234705-1	WG	NORM	02/25/19	Stage 2A	X	X	X		X			
440-234705-1	COH-2B1-EM17	440-234705-2	WG	NORM	02/25/19	Stage 2A	X	X	X		X			
440-234705-1	SWFTS-MW02-EM17	440-234705-3	WG	NORM	02/25/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW14-EM17	440-234812-1	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	PC-92-EM17	440-234812-2	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	PC-91-EM17	440-234812-3	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW10A-EM17	440-234812-4	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW20-EM17	440-234812-5	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-20190226-FB	440-234812-6	BW	FB	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW16-EM17	440-234812-7	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-20190226-EB	440-234812-8	BW	EB	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW18-EM17	440-234812-9	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW21-EM17	440-234812-10	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW01-EM17	440-234812-11	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234812-1	SWFTS-MW09A-EM17	440-234812-12	WG	NORM	02/26/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-MW19-EM17	440-234933-1	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-MW19-EM17-FD	440-234933-2	WG	FD	02/27/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-MW22-EM17	440-234933-3	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-MW23-EM17	440-234933-4	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-MW25-EM17	440-234933-5	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-MW06A-EM17	440-234933-6	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-MW06A-EM17-FD	440-234933-7	WG	FD	02/27/19	Stage 2A	X	X	X		X			
440-234933-1	SWFTS-20190227-EB	440-234933-8	BW	EB	02/27/19	Stage 2A	X	X	X		X			
440-234938-1	PC-94-EM17	440-234938-1	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234938-1	SWFTS-MW24-EM17	440-234938-2	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234938-1	SWFTS-MW03-EM17	440-234938-3	WG	NORM	02/27/19	Stage 2A	X	X	X		X			

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-234938-1	SWFTS-MW05B-EM17	440-234938-4	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-234938-1	SWFTS-MW05A-EM17	440-234938-5	WG	NORM	02/27/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW09B-EM17	440-235000-1	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW17-EM17	440-235000-2	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW13-EM17	440-235000-3	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW12-EM17	440-235000-4	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW08A-EM17	440-235000-5	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW06B-EM17	440-235000-6	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	PC-97-EM17	440-235000-7	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	PC-88-EM17	440-235000-8	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	PC-88-EM17-FD	440-235000-9	WG	FD	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW07A-EM17	440-235000-10	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235000-1	SWFTS-MW07B-EM17	440-235000-11	WG	NORM	02/28/19	Stage 2A	X	X	X		X			
440-235133-1	SWFTS-20190301-FB	440-235133-1	BW	FB	03/01/19	Stage 2A	X	X	X		X			
440-235133-1	PC-58-EM17	440-235133-2	WG	NORM	03/01/19	Stage 2A	X	X	X		X			
440-235133-1	SWFTS-MW11-EM17	440-235133-3	WG	NORM	03/01/19	Stage 2A	X	X	X		X			
440-235133-1	SWFTS-MW11-EM17-FD	440-235133-4	WG	FD	03/01/19	Stage 2A	X	X	X		X			
440-235133-1	SWFTS-MW04-EM17	440-235133-5	WG	NORM	03/01/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW01-EM18	440-238531-1	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-20190410-FB	440-238531-2	BW	FB	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW09A-EM18	440-238531-3	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-20190410-EB	440-238531-4	BW	EB	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW09B-EM18	440-238531-5	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW24-EM18	440-238531-6	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW03-EM18	440-238531-7	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW21-EM18	440-238531-8	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW05A-EM18	440-238531-9	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238531-1	SWFTS-MW05B-EM18	440-238531-10	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238544-1	SWFTS-MW10A-EM18	440-238544-1	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238544-1	SWFTS-MW06A-EM18	440-238544-2	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238544-1	SWFTS-MW06A-EM18-FD	440-238544-3	WG	FD	04/10/19	Stage 2A	X	X	X		X			
440-238544-1	SWFTS-MW06B-EM18	440-238544-4	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238544-1	SWFTS-MW19-EM18	440-238544-5	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238544-1	PC-91-EM18	440-238544-6	WG	NORM	04/10/19	Stage 2A	X	X	X		X			
440-238544-1	PC-92-EM18	440-238544-7	WG	NORM	04/10/19	Stage 2A	X	X	X		X			

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-238544-1	SWFTS-MW19-EM18-FD	440-238544-8	WG	FD	04/10/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-20190409-FB	440-238618-1	BW	FB	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-MW04-EM18	440-238618-2	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-MW02-EM18	440-238618-3	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-MW14-EM18	440-238618-4	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-MW20-EM18	440-238618-5	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	COH-2B1-EM18	440-238618-6	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	PC-88-EM18	440-238618-7	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	PC-88-EM18-FD	440-238618-8	WG	FD	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	PC-97-EM18	440-238618-9	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	PC-58-EM18	440-238618-10	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-MW15-EM18	440-238618-11	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-MW16-EM18	440-238618-12	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238618-1	SWFTS-MW18-EM18	440-238618-13	WG	NORM	04/09/19	Stage 2A	X	X	X		X			
440-238688-1	SWFTS-20190411-EB	440-238688-1	BW	EB	04/11/19	Stage 2A	X	X	X		X			
440-238688-1	SWFTS-MW22-EM18	440-238688-2	WG	NORM	04/11/19	Stage 2A	X	X	X		X			
440-238688-1	SWFTS-MW23-EM18	440-238688-3	WG	NORM	04/11/19	Stage 2A	X	X	X		X			
440-238688-1	SWFTS-MW25-EM18	440-238688-4	WG	NORM	04/11/19	Stage 2A	X	X	X		X			
440-238688-1	SWFTS-MW17-EM18	440-238688-5	WG	NORM	04/11/19	Stage 2A	X	X	X		X			
440-238688-1	PC-94-EM18	440-238688-6	WG	NORM	04/11/19	Stage 2A	X	X	X		X			
440-238733-1	SWFTS-MW08A-EM18	440-238733-1	WG	NORM	04/12/19	Stage 2A	X	X	X		X			
440-238733-1	SWFTS-MW12-EM18	440-238733-2	WG	NORM	04/12/19	Stage 2A	X	X	X		X			
440-238733-1	SWFTS-MW13-EM18	440-238733-3	WG	NORM	04/12/19	Stage 2A	X	X	X		X			
440-238733-1	SWFTS-MW07B-EM18	440-238733-4	WG	NORM	04/12/19	Stage 2A	X	X	X		X			
440-238733-1	SWFTS-MW07A-EM18	440-238733-5	WG	NORM	04/12/19	Stage 2A	X	X	X		X			
440-238733-1	SWFTS-MW11-EM18	440-238733-6	WG	NORM	04/12/19	Stage 2A	X	X	X		X			
440-238733-1	SWFTS-MW11-EM18-FD	440-238733-7	WG	FD	04/12/19	Stage 2A	X	X	X		X			
440-242014-1	SWFTS-MW15-EM19	440-242014-1	WG	NORM	05/20/19	Stage 2A	X	X	X		X	X	X	X
440-242014-1	SWFTS-20190520-FB	440-242014-2	BW	FB	05/20/19	Stage 2A	X	X	X		X	X	X	X
440-242014-1	SWFTS-MW16-EM19	440-242014-3	WG	NORM	05/20/19	Stage 2A	X	X	X		X	X	X	X
440-242015-1	SWFTS-MW06A-EM19	440-242015-1	WG	NORM	05/20/19	Stage 2A	X	X	X		X	X	X	X
440-242015-1	SWFTS-MW06A-EM19-FD	440-242015-2	WG	FD	05/20/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW14-EM19	440-242084-1	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW10A-EM19	440-242084-2	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW20-EM19	440-242084-3	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-242084-1	SWFTS-MW22-EM19	440-242084-4	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW06B-EM19	440-242084-5	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW19-EM19	440-242084-6	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW19-EM19-FD	440-242084-7	WG	FD	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW02-EM19	440-242084-8	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	PC-91-EM19	440-242084-9	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	PC-92-EM19	440-242084-10	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW04-EM19	440-242084-11	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW03-EM19	440-242084-12	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-20190521-FB	440-242084-13	BW	FB	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW01-EM19	440-242084-14	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW18-EM19	440-242084-15	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-20190521-EB	440-242084-16	BW	EB	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW05A-EM19	440-242084-17	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242084-1	SWFTS-MW05B-EM19	440-242084-18	WG	NORM	05/21/19	Stage 2A	X	X	X		X	X	X	X
440-242198-1	SWFTS-MW24-EM19	440-242198-1	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242198-1	SWFTS-20190522-EB	440-242198-2	BW	EB	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242198-1	SWFTS-MW21-EM19	440-242198-3	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242198-1	SWFTS-MW08A-EM19	440-242198-4	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242198-1	SWFTS-MW13-EM19	440-242198-5	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242198-1	SWFTS-MW17-EM19	440-242198-6	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242198-1	SWFTS-MW12-EM19	440-242198-7	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242200-1	SWFTS-MW09A-EM19	440-242200-1	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242200-1	SWFTS-MW09B-EM19	440-242200-2	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242200-1	SWFTS-MW11-EM19	440-242200-3	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242200-1	SWFTS-MW11-EM19-FD	440-242200-4	WG	FD	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242200-1	SWFTS-MW07A-EM19	440-242200-5	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242200-1	SWFTS-MW07B-EM19	440-242200-6	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242200-1	PC-58-EM19	440-242200-7	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242201-1	PC-97-EM19	440-242201-1	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242201-1	PC-88-EM19	440-242201-2	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242201-1	PC-88-EM19-FD	440-242201-3	WG	FD	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242201-1	PC-94-EM19	440-242201-4	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242201-1	COH-2B1-EM19	440-242201-5	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-242201-1	SWFTS-MW25-EM19	440-242201-6	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-242201-1	SWFTS-MW23-EM19	440-242201-7	WG	NORM	05/22/19	Stage 2A	X	X	X		X	X	X	X
440-245046-1	PC-91-EM20	440-245046-1	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245046-1	PC-92-EM20	440-245046-2	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245046-1	SWFTS-MW10A-EM20	440-245046-3	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245046-1	SWFTS-MW06B-EM20	440-245046-4	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245046-1	SWFTS-MW06A-EM20	440-245046-5	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245046-1	SWFTS-MW06A-EM20-FD	440-245046-6	WG	FD	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW16-EM20	440-245068-1	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-20190701-EB	440-245068-2	BW	EB	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW18-EM20	440-245068-3	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	COH-2B1-EM20	440-245068-4	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW01-EM20	440-245068-5	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW05A-EM20	440-245068-6	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW05B-EM20	440-245068-7	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW21-EM20	440-245068-8	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW24-EM20	440-245068-9	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW03-EM20	440-245068-10	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245068-1	SWFTS-MW08A-EM20	440-245068-11	WG	NORM	07/01/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW19-EM20	440-245153-1	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW19-EM20-FD	440-245153-2	WG	FD	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW20-EM20	440-245153-3	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-20190702-FB	440-245153-4	BW	FB	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW22-EM20	440-245153-5	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-20190702-EB	440-245153-6	BW	EB	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW14-EM20	440-245153-7	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW02-EM20	440-245153-8	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW15-EM20	440-245153-9	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW09A-EM20	440-245153-10	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245153-1	SWFTS-MW09B-EM20	440-245153-11	WG	NORM	07/02/19	Stage 2A	X	X	X		X			
440-245218-1	SWFTS-MW25-EM20	440-245218-1	WG	NORM	07/03/19	Stage 2A	X	X	X		X			
440-245218-1	SWFTS-MW23-EM20	440-245218-2	WG	NORM	07/03/19	Stage 2A	X	X	X		X			
440-245218-1	SWFTS-MW11-EM20	440-245218-3	WG	NORM	07/03/19	Stage 2A	X	X	X		X			
440-245218-1	SWFTS-MW11-EM20-FD	440-245218-4	WG	FD	07/03/19	Stage 2A	X	X	X		X			
440-245218-1	SWFTS-MW07B-EM20	440-245218-5	WG	NORM	07/03/19	Stage 2A	X	X	X		X			
440-245218-1	SWFTS-MW07A-EM20	440-245218-6	WG	NORM	07/03/19	Stage 2A	X	X	X		X			

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-245259-1	PC-94-EM20	440-245259-1	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-245259-1	SWFTS-20190705-FB	440-245259-2	BW	FB	07/05/19	Stage 2A	X	X	X		X			
440-245259-1	SWFTS-MW17-EM20	440-245259-3	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-245259-1	SWFTS-MW12-EM20	440-245259-4	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-245259-1	SWFTS-MW13-EM20	440-245259-5	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-245261-1	SWFTS-MW04-EM20	440-245261-1	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-245261-1	PC-97-EM20	440-245261-2	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-245261-1	PC-88-EM20	440-245261-3	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-245261-1	PC-88-EM20-FD	440-245261-4	WG	FD	07/05/19	Stage 2A	X	X	X		X			
440-245261-1	PC-58-EM20	440-245261-5	WG	NORM	07/05/19	Stage 2A	X	X	X		X			
440-247878-1	SWFTS-20190812-FB	440-247878-9	BW	FB	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	PC-91-EM21	440-247878-1	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	PC-92-EM21	440-247878-2	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	SWFTS-MW10A-EM21	440-247878-3	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	PC-94-EM21	440-247878-4	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	SWFTS-MW22-EM21	440-247878-5	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	SWFTS-MW01-EM21	440-247878-6	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	SWFTS-MW09A-EM21	440-247878-7	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247878-1/2	SWFTS-MW09B-EM21	440-247878-8	WG	NORM	08/12/19	Stage 2A	X	X	X		X			
440-247965-1	SWFTS-20190813-EB	440-247965-9	BW	EB	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW20-EM21	440-247965-1	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW21-EM21	440-247965-2	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW18-EM21	440-247965-3	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW16-EM21	440-247965-4	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW15-EM21	440-247965-5	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW14-EM21	440-247965-6	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW05A-EM21	440-247965-7	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-247965-1/2	SWFTS-MW05B-EM21	440-247965-8	WG	NORM	08/13/19	Stage 2A	X	X	X		X			
440-248104-1	PC-97-EM21	440-248104-11	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW24-EM21	440-248104-1	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW03-EM21	440-248104-2	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW02-EM21	440-248104-3	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW25-EM21	440-248104-4	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-20190814-FB	440-248104-5	BW	FB	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW23-EM21	440-248104-6	WG	NORM	08/14/19	Stage 2A	X	X	X		X			

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-248104-1/2	SWFTS-MW06A-EM21	440-248104-7	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW06A-EM21-FD	440-248104-8	WG	FD	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW06B-EM21	440-248104-9	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248104-1/2	SWFTS-MW04-EM21	440-248104-10	WG	NORM	08/14/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-MW07A-EM21	440-248187-1	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-MW07B-EM21	440-248187-2	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-MW11-EM21	440-248187-3	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-MW11-EM21-FD	440-248187-4	WG	FD	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-MW19-EM21	440-248187-5	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-MW19-EM21-FD	440-248187-6	WG	FD	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	COH-2B1-EM21	440-248187-7	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	PC-58-EM21	440-248187-8	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	PC-88-EM21	440-248187-9	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	PC-88-EM21-FD	440-248187-10	WG	FD	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-MW08A-EM21	440-248187-11	WG	NORM	08/15/19	Stage 2A	X	X	X		X			
440-248187-1	SWFTS-20190815-EB	440-248187-12	BW	EB	08/15/19	Stage 2A	X	X	X		X			
440-248259-1	SWFTS-MW17-EM21	440-248259-1	WG	NORM	08/16/19	Stage 2A	X	X	X		X			
440-248259-1	SWFTS-MW12-EM21	440-248259-2	WG	NORM	08/16/19	Stage 2A	X	X	X		X			
440-248259-1	SWFTS-MW13-EM21	440-248259-3	WG	NORM	08/16/19	Stage 2A	X	X	X		X			
440-253773-1	COH-2B1-EM22	440-253773-1	WG	NORM	11/04/19	Stage 2A	X	X	X	X	X	X	X	X
440-253773-1	SWFTS-MW03-EM22	440-253773-2	WG	NORM	11/04/19	Stage 2A	X	X	X	X	X	X	X	X
440-253773-1	SWFTS-MW21-EM22	440-253773-3	WG	NORM	11/04/19	Stage 2A	X	X	X	X	X	X	X	X
440-253891-1	SWFTS-MW09A-EM22	440-253891-1	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253891-1	SWFTS-MW24-EM22	440-253891-2	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253891-1	SWFTS-MW09B-EM22	440-253891-3	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253891-1	SWFTS-MW22-EM22	440-253891-4	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253891-1	SWFTS-MW23-EM22	440-253891-5	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253891-1	SWFTS-MW19-EM22	440-253891-6	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253891-1	SWFTS-MW19-EM22-FD	440-253891-7	WG	FD	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253918-1	SWFTS-MW05A-EM22	440-253918-1	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253918-1	SWFTS-MW05B-EM22	440-253918-2	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253918-1	SWFTS-MW01-EM22	440-253918-3	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253918-1	SWFTS-MW25-EM22	440-253918-4	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253918-1	SWFTS-20191105-FB	440-253918-5	BW	FB	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-253918-1	SWFTS-MW20-EM22	440-253918-6	WG	NORM	11/05/19	Stage 2A	X	X	X	X	X	X	X	X

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-253918-1	SWFTS-20191105-EB	440-253918-7	BW	EB	11/05/19	Stage 2A	X	X	X	X	X	X	X	X
440-254027-1	PC-94-EM22	440-254027-1	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254027-1	PC-92-EM22	440-254027-2	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254027-1	PC-91-EM22	440-254027-3	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254027-1	SWFTS-MW06A-EM22	440-254027-4	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254027-1	SWFTS-MW06A-EM22-FD	440-254027-5	WG	FD	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254027-1	SWFTS-MW06B-EM22	440-254027-6	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254027-1	PC-97-EM22	440-254027-7	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254051-1	SWFTS-MW10A-EM22	440-254051-1	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254051-1	SWFTS-MW14-EM22	440-254051-2	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254051-1	SWFTS-MW15-EM22	440-254051-3	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254051-1	SWFTS-MW18-EM22	440-254051-4	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254051-1	SWFTS-MW16-EM22	440-254051-5	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254051-1	SWFTS-MW13-EM22	440-254051-6	WG	NORM	11/06/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	PC-58-EM22	440-254148-1	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	PC-88-EM22	440-254148-2	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	PC-88-EM22-FD	440-254148-3	WG	FD	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	SWFTS-MW07A-EM22	440-254148-4	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	SWFTS-MW07B-EM22	440-254148-5	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	SWFTS-MW08A-EM22	440-254148-6	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	SWFTS-MW02-EM22	440-254148-7	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254148-1	SWFTS-20191107-EB	440-254148-8	BW	EB	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254150-1	SWFTS-MW17-EM22	440-254150-1	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254150-1	SWFTS-MW12-EM22	440-254150-2	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254150-1	SWFTS-MW11-EM22	440-254150-3	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254150-1	SWFTS-MW11-EM22-FD	440-254150-4	WG	FD	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254150-1	SWFTS-20191107-FB	440-254150-5	BW	FB	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-254150-1	SWFTS-MW04-EM22	440-254150-6	WG	NORM	11/07/19	Stage 2A	X	X	X	X	X	X	X	X
440-255698-1	SWFTS-MW12-EM22-R	440-255698-1	WG	NORM	11/26/19	Stage 2A	X	X	X	X	X	X	X	X
440-255698-1	SWFTS-MW12-EM22-R-FD	440-255698-2	WG	FD	11/26/19	Stage 2A	X	X	X	X	X	X	X	X
440-257635-1	SWFTS-MW16-EM23	440-257635-1	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-20191217-EB	440-257635-2	BW	EB	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-MW11-EM23	440-257635-3	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-MW11-EM23-FD	440-257635-4	WG	FD	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-20191217-FB	440-257635-5	BW	FB	12/17/19	Stage 2A	X	X	X		X			

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-257635-1	SWFTS-MW15-EM23	440-257635-6	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-MW14-EM23	440-257635-7	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-MW02-EM23	440-257635-8	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	PC-91-EM23	440-257635-9	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	PC-92-EM23	440-257635-10	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-MW10A-EM23	440-257635-11	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-MW20-EM23	440-257635-12	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257635-1	SWFTS-MW18-EM23	440-257635-13	WG	NORM	12/17/19	Stage 2A	X	X	X		X			
440-257733-1	COH-2B1-EM23	440-257733-1	WG	NORM	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-20191218-EB	440-257733-2	BW	EB	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-MW01-EM23	440-257733-3	WG	NORM	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-20191218-FB	440-257733-4	BW	FB	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-MW09A-EM23	440-257733-5	WG	NORM	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-MW09B-EM23	440-257733-6	WG	NORM	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-MW21-EM23	440-257733-7	WG	NORM	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-MW05A-EM23	440-257733-8	WG	NORM	12/18/19	Stage 2A	X	X	X		X			
440-257733-1	SWFTS-MW05B-EM23	440-257733-9	WG	NORM	12/18/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW19-EM23	440-257866-1	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW19-EM23-FD	440-257866-2	WG	FD	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW22-EM23	440-257866-3	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	PC-94-EM23	440-257866-4	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW03-EM23	440-257866-5	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW24-EM23	440-257866-6	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW23-EM23	440-257866-7	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW25-EM23	440-257866-8	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW06A-EM23	440-257866-9	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW06A-EM23-FD	440-257866-10	WG	FD	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW06B-EM23	440-257866-11	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW04-EM23	440-257866-12	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257866-1	SWFTS-MW08A-EM23	440-257866-13	WG	NORM	12/19/19	Stage 2A	X	X	X		X			
440-257938-1	SWFTS-MW12-EM23	440-257938-1	WG	NORM	12/20/19	Stage 2A	X	X	X		X			
440-257938-1	SWFTS-MW17-EM23	440-257938-2	WG	NORM	12/20/19	Stage 2A	X	X	X		X			
440-257938-1	SWFTS-MW13-EM23	440-257938-3	WG	NORM	12/20/19	Stage 2A	X	X	X		X			
440-257938-1	SWFTS-MW07A-EM23	440-257938-4	WG	NORM	12/20/19	Stage 2A	X	X	X		X			
440-257938-1	SWFTS-MW07B-EM23	440-257938-5	WG	NORM	12/20/19	Stage 2A	X	X	X		X			

Table 2 Sample Cross-Reference

SDG	Sample ID	Lab Sample ID	Matrix	QC Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	RSK175	SM5310B	SW-6010B Dissolved	SW-6010B Total	SW-6020A Dissolved
440-257938-1	PC-97-EM23	440-257938-6	WG	NORM	12/20/19	Stage 2A	X	X	X		X			
440-257938-1	PC-88-EM23	440-257938-7	WG	NORM	12/20/19	Stage 2A	X	X	X		X			
440-257938-1	PC-88-EM23-FD	440-257938-8	WG	FD	12/20/19	Stage 2A	X	X	X		X			
440-257938-1	PC-58-EM23	440-257938-9	WG	NORM	12/20/19	Stage 2A	X	X	X		X			

Table 3 Validation Qualifiers and Definitions

Validation Qualifier	Definition
J-	The result is an estimated quantity, but the result may be biased low.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Table 4 Validation Checks for Stage 2A

Verification and Validation Checks	Stage 2A
Documentation identifies the laboratory receiving and conducting analyses, and includes documentation for all samples submitted by the project or requester for analyses.	X
Requested analytical methods were performed and the analysis dates are present.	X
Requested target analyte results are reported along with the original laboratory data qualifiers and data qualifier definitions for each reported result (and the uncertainty of each result and clear indication of the type of uncertainty reported if required, e.g., for radiochemical analyses).	X
Requested target analyte result units are reported (along with their associated uncertainty units if required, e.g., for radiochemical analyses).	X
Requested reporting limits for all samples are present and results at and below the requested (required) reporting limits are clearly identified (including sample detection limits if required).	X
Sampling dates (including times if needed), date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH, and temperature) are documented.	X
For radiochemical analyses, the sample-specific critical values (sometimes called "critical level," "decision level," or "detection threshold") and sample-specific minimum detectable value, activity, or concentration for all samples are reported, and results at and below the requested (required) critical values are clearly identified.	X
For radiochemical analyses, the chemical yield (if applicable to the method) and reference date and time (especially for short lived isotopes) are reported for all samples (as appropriate).	X
Sample results are evaluated by comparing sample conditions upon receipt at the laboratory (e.g., preservation checks) and sample characteristics (e.g., percent moisture) to the requirements and guidelines present in national or regional data validation documents, analytical method(s), or contract.	X
Requested methods (handling, preparation, cleanup, and analytical) are performed.	X
Method dates (including dates, times and duration of analysis for radiation counting measurements and other methods, if needed) for handling (e.g., Toxicity Characteristic Leaching Procedure), preparation, cleanup and analysis are present, as appropriate.	X
Sample-related QC data and QC acceptance criteria (e.g., method blanks, surrogate recoveries, deuterated monitoring compound (DMC) recoveries, laboratory control sample (LCS) recoveries, duplicate analyses, matrix spike and matrix spike duplicate recoveries, serial dilutions, post digestion spikes, standard reference materials) are provided and linked to the reported field samples (including the field quality control samples such as trip and equipment blanks).	X
Requested spike analytes or compounds (e.g., surrogate, DMCs, LCS spikes, post digestion spikes) have been added, as appropriate.	X
Sample holding times (from sampling date to preparation and preparation to analysis) are evaluated.	X
Frequency of QC samples is checked for appropriateness (e.g., one LCS per 20 samples in a preparation batch).	X
Sample results are evaluated by comparing holding times and sample-related QC data to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract.	X

Table 5 Reason Codes

Reason Code	Description of Qualification
a	Qualified due to low abundance (radiochemical activity)
be	Qualified due to equipment blank contamination
bf	Qualified due to field blank contamination
bl	Qualified due to lab blank contamination
bt	Qualified due to trip blank contamination
bp	Qualified due to pump blank contamination (for wells without dedicated pumps)
br	Qualified due to filter blank contamination (aqueous hexavalent chromium and dissolved sample fractions)
brr	Better result was reported
c	Qualified due to calibration problems
cp	Qualified due to insufficient ingrowth (radiochemical only)
dc	Dual column confirmation % difference exceeded
e	Sample concentration exceeded the calibration range
fd	Qualified due to field duplicate imprecision
h	Qualified due to holding time exceedance
i	Qualified due to internal standard areas or retention times
k	Qualified as Estimated Maximum Possible Concentrations (dioxins and PCB congeners)
l	Qualified due to LCS recoveries
ld	Qualified due to lab duplicate imprecision (matrix duplicate, MSD, LCSD)
m	Qualified due to matrix spike recoveries
nb	Qualified due to negative lab blank contamination (nondetect results only)
nd	Qualified due to non-detected target analyte
o	Other
p	Qualified as a false positive due to contamination during shipping
pH	Sample preservation not within acceptance range
q	Qualified due to quantitation problem
s	Qualified due to surrogate recoveries
sd	Serial dilution did not meet control criteria
sp	Detected value reported between MDL/SQL and RL/PQL
st	Sample receipt temperature exceeded
t	Qualified due to elevated helium tracer concentrations
vh	Headspace detected in aqueous sample containers submitted for volatile analysis
x	Qualified due to low % solids
z	Qualified due to interference check sample results

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-228394-1	SWFTS-MW16-EM16	12/19/18	EPA 300.0	Total	Nitrate [as N]	1	mg/L	J	0.55	1.1	J	sp	Detect < PQL
440-228394-1	SWFTS-MW16-EM16	12/19/18	EPA 300.0	TOTAL	Sulfate	2000	mg/L	E	2.5	5	R	brr	Better result reported
440-228491-1	SWFTS-20181220-EB	12/20/18	EPA 300.0	Total	Sulfate	0.49	mg/L	J	0.25	0.5	J	sp	Detect < PQL
440-228491-1	SWFTS-MW02-EM16	12/20/18	EPA 300.0	Total	Sulfate	1400	mg/L		130	250	J+	be	EB
440-228491-1	SWFTS-MW05A-EM16	12/20/18	EPA 300.0	Total	Nitrate [as N]	16	mg/L	J	11	22	R	brr	Better result reported
440-228491-1	SWFTS-MW10A-EM16	12/20/18	EPA 300.0	Total	Nitrate [as N]	11	mg/L	U	11	22	R	brr	Better result reported
440-228491-1	SWFTS-MW14-EM16	12/20/18	EPA 300.0	Total	Sulfate	720	mg/L		50	100	J+	be	EB
440-228491-1	SWFTS-MW20-EM16	12/20/18	EPA 300.0	Total	Sulfate	1500	mg/L		130	250	J+	be	EB
440-228491-1	SWFTS-MW21-EM16	12/20/18	EPA 300.0	Total	Sulfate	3500	mg/L	E	2.5	5	R	brr	Better result reported
440-228491-1	PC-91-EM16	12/20/18	EPA 300.1B	Total	Chlorate	47	ug/L	J	10	100	J	sp	Detect < PQL
440-228491-1	SWFTS-MW02-EM16	12/20/18	EPA 300.1B	Total	Chlorate	77	ug/L	J	10	100	J	sp	Detect < PQL
440-228818-1	SWFTS-MW01-EM16	12/27/18	EPA 300.0	Total	Sulfate	1900	mg/L	E	0.5	1	R	brr	Better result reported
440-228887-1	SWFTS-MW06A-EM16-FD	12/28/18	EPA 300.0	Total	Sulfate	1100	mg/L	E	0.5	1	R	brr	Better result reported
440-228887-1	SWFTS-MW23-EM16	12/28/18	EPA 300.0	Total	Sulfate	1100	mg/L	E	0.5	1	R	brr	Better result reported
440-229018-1	SWFTS-MW08A-EM16	01/02/19	EPA 300.0	Total	Sulfate	1600	mg/L	E	2.5	5	R	brr	Better result reported
440-229018-1	SWFTS-MW11-EM16	01/02/19	EPA 300.0	Total	Sulfate	2200	mg/L	E	2.5	5	R	brr	Better result reported
440-229111-1	SWFTS-MW07B-EM16	01/03/19	EPA 300.0	Total	Sulfate	1100	mg/L	E	2.5	5	R	brr	Better result reported
440-234705-1	SWFTS-MW02-EM17	02/25/19	EPA 300.1B	Total	Chlorate	32	ug/L	J	10	100	J	sp	Detect < PQL
440-234812-1	SWFTS-MW10A-EM17	02/26/19	EPA 300.0	Total	Nitrate [as N]	2.1	mg/L	J	1.1	2.2	J	sp	Detect < PQL
440-234812-1	SWFTS-MW10A-EM17	02/26/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-234812-1	SWFTS-MW20-EM17	02/26/19	EPA 300.0	Total	Nitrate [as N]	1.5	mg/L	J	1.1	2.2	J	sp	Detect < PQL
440-234933-1	SWFTS-MW06A-EM17	02/27/19	EPA 300.0	Total	Sulfate	1000	mg/L	E	0.5	1	R	brr	Better result reported
440-234933-1	SWFTS-MW19-EM17-FD	02/27/19	EPA 300.0	Total	Nitrate [as N]	0.38	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-234938-1	SWFTS-MW05A-EM17	02/27/19	EPA 300.0	Total	Nitrate [as N]	35	mg/L	J	28	55	R	brr	Better result reported
440-234938-1	SWFTS-MW03-EM17	02/27/19	EPA 300.1B	Total	Chlorate	27	ug/L	J	10	100	J	sp	Detect < PQL
440-235000-1	PC-88-EM17	02/28/19	EPA 300.0	Total	Sulfate	920	mg/L	E	2.5	5	R	brr	Better result reported
440-235000-1	SWFTS-MW08A-EM17	02/28/19	EPA 300.0	Total	Sulfate	1700	mg/L	E	2.5	5	R	brr	Better result reported
440-235000-1	SWFTS-MW09B-EM17	02/28/19	EPA 300.0	Total	Nitrate [as N]	16	mg/L	F1	0.55	1.1	J-	m	MS Recovery
440-235000-1	SWFTS-MW09B-EM17	02/28/19	EPA 300.0	Total	Sulfate	1700	mg/L	E	2.5	5	R	brr	Better result reported
440-235000-1	SWFTS-MW17-EM17	02/28/19	EPA 300.0	Total	Sulfate	2600	mg/L	E	2.5	5	R	brr	Better result reported
440-235133-1	PC-58-EM17	03/01/19	EPA 300.0	Total	Sulfate	2100	mg/L	E	0.5	1	R	brr	Better result reported
440-235133-1	SWFTS-MW04-EM17	03/01/19	EPA 300.0	Total	Sulfate	1100	mg/L	E	0.5	1	R	brr	Better result reported
440-235133-1	PC-58-EM17	03/01/19	EPA 314.0	Total	Perchlorate	1700	ug/L		95	400	J+	bf	FB
440-235133-1	SWFTS-20190301-FB	03/01/19	EPA 314.0	Total	Perchlorate	1.4	ug/L	J	0.95	4	J	sp	Detect < PQL
440-235133-1	SWFTS-MW04-EM17	03/01/19	EPA 314.0	Total	Perchlorate	3500	ug/L		95	400	J+	bf	FB
440-235133-1	SWFTS-MW11-EM17	03/01/19	EPA 314.0	Total	Perchlorate	7900	ug/L		95	400	J+	bf	FB
440-235133-1	SWFTS-MW11-EM17-FD	03/01/19	EPA 314.0	Total	Perchlorate	7700	ug/L		95	400	J+	bf	FB
440-238531-1	SWFTS-MW03-EM18	04/10/19	EPA 300.0	Total	Sulfate	2600	mg/L	E	2.5	5	R	brr	Better result reported
440-238531-1	SWFTS-MW05A-EM18	04/10/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-238531-1	SWFTS-MW09A-EM18	04/10/19	EPA 300.0	Total	Sulfate	1700	mg/L	E	2.5	5	R	brr	Better result reported
440-238531-1	SWFTS-MW05A-EM18	04/10/19	EPA 300.1B	Total	Chlorate	56	ug/L	J	10	100	J	sp	Detect < PQL
440-238531-1	SWFTS-MW05B-EM18	04/10/19	EPA 300.1B	Total	Chlorate	19	ug/L	J	10	100	J	sp	Detect < PQL
440-238544-1	SWFTS-MW06B-EM18	04/10/19	EPA 300.0	Total	Sulfate	900	mg/L	E	1.3	2.5	R	brr	Better result reported
440-238544-1	SWFTS-MW10A-EM18	04/10/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-238544-1	SWFTS-MW19-EM18	04/10/19	EPA 300.0	Total	Nitrate [as N]	0.33	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-238544-1	SWFTS-MW19-EM18-FD	04/10/19	EPA 300.0	Total	Nitrate [as N]	0.37	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-238544-1	SWFTS-MW19-EM18-FD	04/10/19	EPA 300.0	Total	Sulfate	1100	mg/L	E	1.3	2.5	R	brr	Better result reported
440-238544-1	PC-91-EM18	04/10/19	EPA 300.1B	Total	Chlorate	38	ug/L	J	10	100	J	sp	Detect < PQL
440-238618-1	COH-2B1-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	0.65	mg/L	H	0.28	0.55	J-	h	Holding Time

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-238618-1	PC-58-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	9.1	mg/L	H	0.55	1.1	J-	h	Holding Time
440-238618-1	PC-88-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	5.1	mg/L	H	0.55	1.1	J-	h	Holding Time
440-238618-1	PC-88-EM18-FD	04/09/19	EPA 300.0	Total	Nitrate [as N]	5	mg/L	H	0.55	1.1	J-	h	Holding Time
440-238618-1	PC-97-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	0.71	mg/L	H	0.28	0.55	J-	h	Holding Time
440-238618-1	SWFTS-20190409-FB	04/09/19	EPA 300.0	Total	Nitrate [as N]	0.055	mg/L	UH	0.055	0.11	UJ	h	Holding Time
440-238618-1	SWFTS-MW02-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	1.1	mg/L	UH	1.1	2.2	UJ	h	Holding Time
440-238618-1	SWFTS-MW04-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	2.3	mg/L	H	0.28	0.55	J-	h	Holding Time
440-238618-1	SWFTS-MW14-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	0.55	mg/L	UH	0.55	1.1	UJ	h	Holding Time
440-238618-1	SWFTS-MW15-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	14	mg/L	H	0.55	1.1	J-	h	Holding Time
440-238618-1	SWFTS-MW16-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	0.55	mg/L	UH	0.55	1.1	UJ	h	Holding Time
440-238618-1	SWFTS-MW18-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	11	mg/L	H	0.55	1.1	J-	h	Holding Time
440-238618-1	SWFTS-MW20-EM18	04/09/19	EPA 300.0	Total	Nitrate [as N]	1.7	mg/L	JH	1.1	2.2	J	h,sp	Holding Time, Detect < PQL
440-238618-1	SWFTS-MW02-EM18	04/09/19	EPA 300.1B	Total	Chlorate	82	ug/L	J	10	100	J	sp	Detect < PQL
440-238688-1	SWFTS-MW22-EM18	04/11/19	EPA 300.0	Total	Sulfate	1100	mg/L	E	2.5	5	R	brr	Better result reported
440-242014-1	SWFTS-MW16-EM19	05/20/19	EPA 314.0	Total	Perchlorate	0.95	ug/L	UF1	0.95	4	UJ	m	MS Recovery
440-242014-1	SWFTS-20190520-FB	05/20/19	SW-6010B	Dissolved	Magnesium	0.043	mg/L		0.01	0.02	J+	bl	Lab Blank
440-242014-1	SWFTS-20190520-FB	05/20/19	SW-6010B	Dissolved	Sodium	1.2	mg/L	B	0.26	0.5	J+	bl	Lab Blank
440-242014-1	SWFTS-MW15-EM19	05/20/19	SW-6010B	Dissolved	Aluminum	0.076	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-242014-1	SWFTS-MW16-EM19	05/20/19	SW-6010B	Dissolved	Molybdenum	0.013	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-242014-1	SWFTS-MW15-EM19	05/20/19	SW-6020A	Dissolved	Antimony	1.8	ug/L	J	0.5	2	J	sp	Detect < PQL
440-242014-1	SWFTS-MW15-EM19	05/20/19	SW-6020A	Dissolved	Thallium	0.36	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242015-1	SWFTS-MW06A-EM19	05/20/19	SW-6010B	Dissolved	Cobalt	0.0052	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242015-1	SWFTS-MW06A-EM19	05/20/19	SW-6010B	Dissolved	Molybdenum	0.019	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-242015-1	SWFTS-MW06A-EM19-FD	05/20/19	SW-6010B	Dissolved	Cobalt	0.0055	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242015-1	SWFTS-MW06A-EM19	05/20/19	SW-6020A	Dissolved	Selenium	0.92	ug/L	J	0.5	2	J	sp	Detect < PQL
440-242015-1	SWFTS-MW06A-EM19	05/20/19	SW-6020A	Dissolved	Thallium	0.34	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242015-1	SWFTS-MW06A-EM19-FD	05/20/19	SW-6020A	Dissolved	Selenium	0.72	ug/L	J	0.5	2	J	sp	Detect < PQL
440-242015-1	SWFTS-MW06A-EM19-FD	05/20/19	SW-6020A	Dissolved	Thallium	0.33	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242084-1	PC-92-EM19	05/21/19	EPA 300.0	Total	Sulfate	1000	mg/L	E	0.5	1	R	brr	Better result reported
440-242084-1	SWFTS-MW01-EM19	05/21/19	EPA 300.0	Total	Sulfate	1500	mg/L	E	2.5	5	R	brr	Better result reported
440-242084-1	SWFTS-MW05A-EM19	05/21/19	EPA 300.0	Total	Nitrate [as N]	35	mg/L	J	28	55	R	brr	Better result reported
440-242084-1	SWFTS-MW10A-EM19	05/21/19	EPA 300.0	Total	Nitrate [as N]	11	mg/L	U	11	22	R	brr	Better result reported
440-242084-1	SWFTS-MW19-EM19	05/21/19	EPA 300.0	Total	Nitrate [as N]	0.18	mg/L	J	0.11	0.22	J	sp	Detect < PQL
440-242084-1	SWFTS-MW20-EM19	05/21/19	EPA 300.0	Total	Nitrate [as N]	1.3	mg/L	J	1.1	2.2	J	sp	Detect < PQL
440-242084-1	SWFTS-MW22-EM19	05/21/19	EPA 300.0	Total	Sulfate	1200	mg/L	E	1.3	2.5	R	brr	Better result reported
440-242084-1	SWFTS-MW02-EM19	05/21/19	EPA 300.1B	Total	Chlorate	50	ug/L	J	10	100	J	sp	Detect < PQL
440-242084-1	SWFTS-MW05A-EM19	05/21/19	EPA 300.1B	Total	Chlorate	17	ug/L	J	10	100	J	sp	Detect < PQL
440-242084-1	SWFTS-MW10A-EM19	05/21/19	EPA 300.1B	Total	Chlorate	34	ug/L	J	10	100	J	sp	Detect < PQL
440-242084-1	SWFTS-MW20-EM19	05/21/19	EPA 300.1B	Total	Chlorate	69	ug/L	J	10	100	J	sp	Detect < PQL
440-242084-1	PC-91-EM19	05/21/19	EPA 314.0	Total	Perchlorate	130	ug/L	E	0.95	4	R	brr	Better result reported
440-242084-1	SWFTS-20190521-EB	05/21/19	SW-6010B	Dissolved	Boron	0.041	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-242084-1	SWFTS-20190521-EB	05/21/19	SW-6010B	Dissolved	Magnesium	0.014	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-242084-1	SWFTS-MW03-EM19	05/21/19	SW-6010B	Dissolved	Iron	0.054	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW05A-EM19	05/21/19	SW-6010B	Dissolved	Silver	0.005	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242084-1	SWFTS-MW10A-EM19	05/21/19	SW-6010B	Dissolved	Iron	0.071	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW10A-EM19	05/21/19	SW-6010B	Dissolved	Silver	0.006	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242084-1	SWFTS-MW14-EM19	05/21/19	SW-6010B	Dissolved	Iron	0.085	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW14-EM19	05/21/19	SW-6010B	Dissolved	Titanium	0.0032	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-242084-1	SWFTS-MW14-EM19	05/21/19	SW-6010B	Dissolved	Vanadium	0.005	mg/L	J	0.005	0.01	J	sp	Detect < PQL

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-242084-1	SWFTS-MW18-EM19	05/21/19	SW-6010B	Dissolved	Titanium	0.0029	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-242084-1	SWFTS-MW19-EM19-FD	05/21/19	SW-6010B	Dissolved	Iron	0.058	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW20-EM19	05/21/19	SW-6010B	Dissolved	Iron	0.06	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW20-EM19	05/21/19	SW-6010B	Dissolved	Silver	0.0066	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242084-1	SWFTS-MW22-EM19	05/21/19	SW-6010B	Dissolved	Silver	0.0052	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242084-1	PC-91-EM19	05/21/19	SW-6020A	Dissolved	Selenium	1.1	ug/L	J	0.5	2	J	sp	Detect < PQL
440-242084-1	PC-92-EM19	05/21/19	SW-6020A	Dissolved	Thallium	0.48	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW02-EM19	05/21/19	SW-6020A	Dissolved	Thallium	0.26	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW03-EM19	05/21/19	SW-6020A	Dissolved	Thallium	0.89	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW04-EM19	05/21/19	SW-6020A	Dissolved	Thallium	0.62	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW06B-EM19	05/21/19	SW-6020A	Dissolved	Selenium	1.2	ug/L	J	0.5	2	J	sp	Detect < PQL
440-242084-1	SWFTS-MW06B-EM19	05/21/19	SW-6020A	Dissolved	Thallium	0.39	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242084-1	SWFTS-MW10A-EM19	05/21/19	SW-6020A	Dissolved	Antimony	0.61	ug/L	J	0.5	2	J	sp	Detect < PQL
440-242084-1	SWFTS-MW18-EM19	05/21/19	SW-6020A	Dissolved	Thallium	0.25	ug/L	J	0.2	1	J	sp	Detect < PQL
440-242198-1	SWFTS-MW24-EM19	05/22/19	EPA 300.0	Total	Sulfate	2100	mg/L	E	2.5	5	R	brr	Better result reported
440-242198-1	SWFTS-MW12-EM19	05/22/19	SM5310B	Total	Total Organic Carbon	0.87	mg/L	J	0.65	1	J	sp	Detect < PQL
440-242198-1	SWFTS-MW13-EM19	05/22/19	SM5310B	Total	Total Organic Carbon	0.94	mg/L	J	0.65	1	J	sp	Detect < PQL
440-242198-1	SWFTS-20190522-EB	05/22/19	SW-6010B	Dissolved	Magnesium	0.016	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-242198-1	SWFTS-MW12-EM19	05/22/19	SW-6010B	Dissolved	Silver	0.006	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242198-1	SWFTS-MW13-EM19	05/22/19	SW-6010B	Dissolved	Silver	0.0058	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242198-1	SWFTS-MW21-EM19	05/22/19	SW-6010B	Dissolved	Silver	0.0055	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242198-1	SWFTS-MW24-EM19	05/22/19	SW-6010B	Dissolved	Silver	0.0055	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242198-1	SWFTS-MW24-EM19	05/22/19	SW-6010B	Dissolved	Titanium	0.003	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-242198-1	SWFTS-MW24-EM19	05/22/19	SW-6020A	Dissolved	Selenium	12	ug/L	JF1	5	20	J	sp	Detect < PQL
440-242200-1	SWFTS-MW09A-EM19	05/22/19	EPA 300.0	Total	Sulfate	1800	mg/L	E	2.5	5	R	brr	Better result reported
440-242200-1	SWFTS-MW11-EM19-FD	05/22/19	EPA 300.0	Total	Sulfate	2000	mg/L	E	2.5	5	R	brr	Better result reported
440-242200-1	SWFTS-MW07A-EM19	05/22/19	SW-6010B	Dissolved	Chromium	0.0036	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-242200-1	SWFTS-MW09A-EM19	05/22/19	SW-6010B	Dissolved	Cobalt	0.0059	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242200-1	SWFTS-MW09B-EM19	05/22/19	SW-6010B	Dissolved	Chromium	0.0039	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-242200-1	SWFTS-MW11-EM19	05/22/19	SW-6010B	Total	Manganese	1.8	mg/L		0.015	0.02	J	fd	FD
440-242200-1	SWFTS-MW11-EM19-FD	05/22/19	SW-6010B	Total	Manganese	0.015	mg/L	U	0.015	0.02	UJ	fd	FD
440-242200-1	SWFTS-MW09A-EM19	05/22/19	SW-6020A	Dissolved	Selenium	8.6	ug/L	J	5	20	J	sp	Detect < PQL
440-242201-1	PC-97-EM19	05/22/19	EPA 300.0	Total	Sulfate	1300	mg/L	E	0.5	1	R	brr	Better result reported
440-242201-1	PC-88-EM19	05/22/19	SW-6010B	Total	Manganese	0.91	mg/L		0.015	0.02	J	sd	Serial Dilution
440-242201-1	PC-88-EM19-FD	05/22/19	SW-6010B	Total	Manganese	0.89	mg/L		0.015	0.02	J	sd	Serial Dilution
440-242201-1	PC-94-EM19	05/22/19	SW-6010B	Dissolved	Cobalt	0.0067	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-242201-1	PC-94-EM19	05/22/19	SW-6010B	Dissolved	Iron	0.079	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-242201-1	PC-94-EM19	05/22/19	SW-6010B	Dissolved	Titanium	0.0041	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-242201-1	SWFTS-MW23-EM19	05/22/19	SW-6010B	Dissolved	Silicon	29	mg/L		0.1	0.2	J	sd	Serial Dilution
440-242201-1	SWFTS-MW23-EM19	05/22/19	SW-6010B	Dissolved	Titanium	0.0025	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-242201-1	PC-88-EM19	05/22/19	SW-6020A	Dissolved	Selenium	5.7	ug/L	J	5	20	J	sp	Detect < PQL
440-242201-1	PC-88-EM19-FD	05/22/19	SW-6020A	Dissolved	Selenium	5.6	ug/L	J	5	20	J	sp	Detect < PQL
440-242201-1	PC-94-EM19	05/22/19	SW-6020A	Dissolved	Selenium	9.2	ug/L	J	5	20	J	sp	Detect < PQL
440-242201-1	SWFTS-MW25-EM19	05/22/19	SW-6020A	Dissolved	Selenium	18	ug/L	J	5	20	J	sp	Detect < PQL
440-245046-1	SWFTS-MW06B-EM20	07/01/19	EPA 300.0	Total	Sulfate	1100	mg/L	E	0.5	1	R	brr	Better result reported
440-245046-1	SWFTS-MW10A-EM20	07/01/19	EPA 300.0	Total	Nitrate [as N]	0.84	mg/L	J	0.55	1.1	J	sp	Detect < PQL
440-245046-1	SWFTS-MW10A-EM20	07/01/19	EPA 300.0	Total	Nitrate [as N]	11	mg/L	U	11	22	R	brr	Better result reported
440-245046-1	SWFTS-MW06A-EM20	07/01/19	EPA 300.1B	Total	Chlorate	350	ug/L	F1	10	100	J	m	MS Recovery
440-245046-1	SWFTS-MW06A-EM20-FD	07/01/19	EPA 300.1B	Total	Chlorate	310	ug/L		10	100	J	m	MS Recovery

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-245068-1	SWFTS-MW05A-EM20	07/01/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-245068-1	SWFTS-MW05B-EM20	07/01/19	EPA 300.0	Total	Sulfate	2400	mg/L	E	2.5	5	R	brr	Better result reported
440-245068-1	SWFTS-MW24-EM20	07/01/19	EPA 300.0	Total	Sulfate	2200	mg/L	E	2.5	5	R	brr	Better result reported
440-245068-1	SWFTS-20190701-EB	07/01/19	EPA 314.0	Total	Perchlorate	1.8	ug/L	J	0.95	4	J	sp	Detect < PQL
440-245153-1	SWFTS-MW19-EM20	07/02/19	EPA 300.0	Total	Sulfate	1000	mg/L	E	0.25	0.5	R	brr	Better result reported
440-245153-1	SWFTS-MW20-EM20	07/02/19	EPA 300.0	Total	Nitrate [as N]	0.7	mg/L	J	0.55	1.1	J	sp	Detect < PQL
440-245153-1	SWFTS-MW22-EM20	07/02/19	EPA 300.0	Total	Sulfate	1200	mg/L	E	0.5	1	R	brr	Better result reported
440-245153-1	SWFTS-MW20-EM20	07/02/19	EPA 300.1B	Total	Chlorate	37	ug/L	J	10	100	J	sp	Detect < PQL
440-245153-1	SWFTS-MW14-EM20	07/02/19	EPA 314.0	Total	Perchlorate	2.8	ug/L	J	0.95	4	J	sp	Detect < PQL
440-245218-1	SWFTS-MW07A-EM20	07/03/19	EPA 300.0	Total	Sulfate	1400	mg/L	E	2.5	5	R	brr	Better result reported
440-245218-1	SWFTS-MW11-EM20-FD	07/03/19	EPA 300.0	Total	Sulfate	1900	mg/L	E	2.5	5	R	brr	Better result reported
440-245259-1	SWFTS-MW12-EM20	07/05/19	EPA 300.0	Total	Nitrate [as N]	13	mg/L	F1	0.28	0.55	J+	m	MS Recovery
440-245259-1	SWFTS-MW12-EM20	07/05/19	EPA 300.0	Total	Sulfate	3800	mg/L	E	1.3	2.5	R	brr	Better result reported
440-245261-1	PC-58-EM20	07/05/19	EPA 300.0	Total	Sulfate	1700	mg/L	E	0.5	1	R	brr	Better result reported
440-245261-1	PC-97-EM20	07/05/19	EPA 300.0	Total	Sulfate	1300	mg/L	E	0.5	1	R	brr	Better result reported
440-247878-1	SWFTS-MW10A-EM21	08/12/19	EPA 300.0	Total	Nitrate [as N]	11	mg/L	U	11	22	R	brr	Better result reported
440-247878-1	PC-91-EM21	08/12/19	EPA 300.1B	Total	Chlorate	14	ug/L	J	10	100	J	sp	Detect < PQL
440-247878-2	PC-91-EM21	08/12/19	EPA 314.0	Total	Perchlorate	39	ug/L	F1	0.5	1	J+	m	MS Recovery
440-247965-1	SWFTS-MW05A-EM21	08/13/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-247965-1	SWFTS-MW20-EM21	08/13/19	EPA 300.0	Total	Nitrate [as N]	0.41	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-247965-1	SWFTS-MW05A-EM21	08/13/19	EPA 300.1B	Total	Chlorate	33	ug/L	J	10	100	J	sp	Detect < PQL
440-247965-1	SWFTS-MW20-EM21	08/13/19	EPA 300.1B	Total	Chlorate	23	ug/L	J	10	100	J	sp	Detect < PQL
440-248104-1	SWFTS-MW06A-EM21-FD	08/14/19	EPA 300.0	Total	Sulfate	1300	mg/L	E	1.3	2.5	R	brr	Better result reported
440-248187-1	COH-2B1-EM21	08/15/19	EPA 300.0	Total	Sulfate	1300	mg/L	E	1.3	2.5	R	brr	Better result reported
440-248187-1	SWFTS-MW07A-EM21	08/15/19	EPA 300.0	Total	Sulfate	1400	mg/L	E	2.5	5	R	brr	Better result reported
440-248259-1	SWFTS-MW13-EM21	08/16/19	EPA 300.0	Total	Sulfate	3400	mg/L	E	5	10	R	brr	Better result reported
440-253773-1	COH-2B1-EM22	11/04/19	EPA 300.0	Total	Sulfate	1600	mg/L	E	2.5	5	R	brr	Better result reported
440-253773-1	COH-2B1-EM22	11/04/19	SW-6010B	Dissolved	Chromium	0.0095	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253773-1	COH-2B1-EM22	11/04/19	SW-6010B	Dissolved	Titanium	0.014	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253773-1	SWFTS-MW03-EM22	11/04/19	SW-6010B	Dissolved	Chromium	0.0042	mg/L	JB	0.0025	0.005	J	bl,sp	Lab Blank, Detect < PQL
440-253773-1	SWFTS-MW03-EM22	11/04/19	SW-6010B	Dissolved	Iron	0.061	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253773-1	SWFTS-MW21-EM22	11/04/19	SW-6010B	Dissolved	Aluminum	0.076	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253773-1	SWFTS-MW21-EM22	11/04/19	SW-6010B	Dissolved	Chromium	0.0053	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253773-1	SWFTS-MW21-EM22	11/04/19	SW-6010B	Dissolved	Cobalt	0.0067	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253773-1	SWFTS-MW21-EM22	11/04/19	SW-6010B	Dissolved	Iron	0.059	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253773-1	SWFTS-MW03-EM22	11/04/19	SW-6020A	Dissolved	Thallium	0.77	ug/L	J	0.2	1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW09A-EM22	11/05/19	EPA 300.0	Total	Sulfate	1500	mg/L	E	2.5	5	R	brr	Better result reported
440-253891-1	SWFTS-MW19-EM22	11/05/19	EPA 300.0	Total	Nitrate [as N]	0.36	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-253891-1	SWFTS-MW19-EM22-FD	11/05/19	EPA 300.0	Total	Nitrate [as N]	0.37	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-253891-1	SWFTS-MW19-EM22-FD	11/05/19	EPA 300.0	Total	Sulfate	990	mg/L	E	1.3	2.5	R	brr	Better result reported
440-253891-1	SWFTS-MW09A-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.051	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW09A-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.005	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW09A-EM22	11/05/19	SW-6010B	Dissolved	Nickel	0.0096	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253891-1	SWFTS-MW09B-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.058	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW09B-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0055	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW09B-EM22	11/05/19	SW-6010B	Dissolved	Nickel	0.0088	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253891-1	SWFTS-MW19-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.051	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW19-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0056	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW19-EM22	11/05/19	SW-6010B	Dissolved	Cobalt	0.0053	mg/L	J	0.005	0.01	J	sp	Detect < PQL

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-253891-1	SWFTS-MW19-EM22	11/05/19	SW-6010B	Dissolved	Molybdenum	0.066	mg/L		0.01	0.02	J+	bl	Lab Blank
440-253891-1	SWFTS-MW19-EM22	11/05/19	SW-6010B	Dissolved	Zinc	0.012	mg/L	U	0.012	0.02	UJ	fd	FD
440-253891-1	SWFTS-MW19-EM22-FD	11/05/19	SW-6010B	Dissolved	Chromium	0.0052	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW19-EM22-FD	11/05/19	SW-6010B	Dissolved	Cobalt	0.0055	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253891-1	SWFTS-MW19-EM22-FD	11/05/19	SW-6010B	Dissolved	Lead	0.004	mg/L	J	0.0038	0.005	J	sp	Detect < PQL
440-253891-1	SWFTS-MW19-EM22-FD	11/05/19	SW-6010B	Dissolved	Molybdenum	0.062	mg/L		0.01	0.02	J+	bl	Lab Blank
440-253891-1	SWFTS-MW19-EM22-FD	11/05/19	SW-6010B	Dissolved	Zinc	0.19	mg/L		0.012	0.02	J	fd	FD
440-253891-1	SWFTS-MW22-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0054	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW22-EM22	11/05/19	SW-6010B	Dissolved	Cobalt	0.0051	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253891-1	SWFTS-MW22-EM22	11/05/19	SW-6010B	Dissolved	Titanium	0.0069	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW23-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.057	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW23-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0052	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW23-EM22	11/05/19	SW-6010B	Dissolved	Molybdenum	0.026	mg/L		0.01	0.02	J+	bl	Lab Blank
440-253891-1	SWFTS-MW24-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.058	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW24-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0061	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253891-1	SWFTS-MW09A-EM22	11/05/19	SW-6020A	Dissolved	Antimony	1.1	ug/L	J	0.5	2	J	sp	Detect < PQL
440-253891-1	SWFTS-MW09A-EM22	11/05/19	SW-6020A	Dissolved	Thallium	0.41	ug/L	J	0.2	1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW09B-EM22	11/05/19	SW-6020A	Dissolved	Thallium	0.39	ug/L	J	0.2	1	J	sp	Detect < PQL
440-253891-1	SWFTS-MW23-EM22	11/05/19	SW-6020A	Dissolved	Selenium	1.5	ug/L	J	0.5	2	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05A-EM22	11/05/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-253918-1	SWFTS-MW05B-EM22	11/05/19	EPA 300.0	Total	Nitrate [as N]	1.6	mg/L	J	1.1	2.2	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05A-EM22	11/05/19	EPA 300.1B	Total	Chlorate	30	ug/L	J	10	100	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05B-EM22	11/05/19	EPA 300.1B	Total	Chlorate	13	ug/L	J	10	100	J	sp	Detect < PQL
440-253918-1	SWFTS-MW20-EM22	11/05/19	EPA 300.1B	Total	Chlorate	26	ug/L	J	10	100	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05A-EM22	11/05/19	EPA 314.0	Total	Perchlorate	3600	ug/L	F1	95	400	J+	m	MS Recovery
440-253918-1	SWFTS-20191105-EB	11/05/19	SW-6010B	Dissolved	Calcium	0.063	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253918-1	SWFTS-20191105-EB	11/05/19	SW-6010B	Dissolved	Chromium	0.0068	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253918-1	SWFTS-20191105-EB	11/05/19	SW-6010B	Dissolved	Magnesium	0.011	mg/L	J	0.01	0.02	J	sp	Detect < PQL
440-253918-1	SWFTS-20191105-EB	11/05/19	SW-6010B	Dissolved	Sodium	0.46	mg/L	J	0.26	0.5	J	sp	Detect < PQL
440-253918-1	SWFTS-20191105-FB	11/05/19	SW-6010B	Dissolved	Chromium	0.0057	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-253918-1	SWFTS-MW01-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.057	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253918-1	SWFTS-MW01-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0053	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-253918-1	SWFTS-MW01-EM22	11/05/19	SW-6010B	Dissolved	Nickel	0.0065	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05A-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.055	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05A-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.022	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-253918-1	SWFTS-MW05B-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.056	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05B-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0041	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-253918-1	SWFTS-MW05B-EM22	11/05/19	SW-6010B	Dissolved	Titanium	0.003	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-253918-1	SWFTS-MW20-EM22	11/05/19	SW-6010B	Dissolved	Aluminum	0.077	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253918-1	SWFTS-MW20-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0051	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-253918-1	SWFTS-MW20-EM22	11/05/19	SW-6010B	Dissolved	Cobalt	0.0054	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253918-1	SWFTS-MW20-EM22	11/05/19	SW-6010B	Dissolved	Iron	0.068	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-253918-1	SWFTS-MW25-EM22	11/05/19	SW-6010B	Dissolved	Chromium	0.0046	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-253918-1	SWFTS-MW25-EM22	11/05/19	SW-6010B	Dissolved	Nickel	0.0072	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-253918-1	SWFTS-MW01-EM22	11/05/19	SW-6020A	Dissolved	Selenium	1.4	ug/L	J	0.5	2	J	sp	Detect < PQL
440-253918-1	SWFTS-MW05A-EM22	11/05/19	SW-6020A	Dissolved	Antimony	2.4	ug/L		0.5	2	J+	bl	Lab Blank
440-253918-1	SWFTS-MW05A-EM22	11/05/19	SW-6020A	Dissolved	Thallium	0.41	ug/L	J	0.2	1	J	sp	Detect < PQL
440-253918-1	SWFTS-MW25-EM22	11/05/19	SW-6020A	Dissolved	Thallium	0.39	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254027-1	PC-91-EM22	11/06/19	EPA 314.0	Total	Perchlorate	1.5	ug/L	J	0.95	4	J	sp	Detect < PQL

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-254027-1	PC-91-EM22	11/06/19	SW-6010B	Dissolved	Aluminum	0.051	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254027-1	PC-92-EM22	11/06/19	SW-6010B	Dissolved	Aluminum	0.057	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254027-1	PC-92-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.0048	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-254027-1	PC-92-EM22	11/06/19	SW-6010B	Dissolved	Molybdenum	0.05	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254027-1	PC-94-EM22	11/06/19	SW-6010B	Dissolved	Aluminum	0.056	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254027-1	PC-94-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.0037	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-254027-1	PC-94-EM22	11/06/19	SW-6010B	Dissolved	Cobalt	0.0068	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254027-1	PC-97-EM22	11/06/19	SW-6010B	Dissolved	Aluminum	0.066	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254027-1	PC-97-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.0046	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-254027-1	PC-97-EM22	11/06/19	SW-6010B	Dissolved	Cobalt	0.006	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254027-1	PC-97-EM22	11/06/19	SW-6010B	Dissolved	Molybdenum	0.025	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254027-1	SWFTS-MW06A-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.0056	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-254027-1	SWFTS-MW06A-EM22	11/06/19	SW-6010B	Dissolved	Cobalt	0.005	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06A-EM22	11/06/19	SW-6010B	Dissolved	Iron	0.083	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06A-EM22	11/06/19	SW-6010B	Dissolved	Molybdenum	0.026	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254027-1	SWFTS-MW06A-EM22-FD	11/06/19	SW-6010B	Dissolved	Chromium	0.0041	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-254027-1	SWFTS-MW06A-EM22-FD	11/06/19	SW-6010B	Dissolved	Cobalt	0.0054	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06A-EM22-FD	11/06/19	SW-6010B	Dissolved	Molybdenum	0.027	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254027-1	SWFTS-MW06B-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.0044	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-254027-1	SWFTS-MW06B-EM22	11/06/19	SW-6010B	Dissolved	Cobalt	0.0056	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06B-EM22	11/06/19	SW-6010B	Dissolved	Iron	0.08	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06B-EM22	11/06/19	SW-6010B	Dissolved	Molybdenum	0.026	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254027-1	PC-91-EM22	11/06/19	SW-6020A	Dissolved	Antimony	0.75	ug/L	J	0.5	2	J	sp	Detect < PQL
440-254027-1	PC-91-EM22	11/06/19	SW-6020A	Dissolved	Selenium	1.1	ug/L	J	0.5	2	J	sp	Detect < PQL
440-254027-1	PC-92-EM22	11/06/19	SW-6020A	Dissolved	Thallium	0.36	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254027-1	PC-97-EM22	11/06/19	SW-6020A	Dissolved	Thallium	0.25	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06A-EM22	11/06/19	SW-6020A	Dissolved	Selenium	0.89	ug/L	J	0.5	2	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06A-EM22	11/06/19	SW-6020A	Dissolved	Thallium	0.32	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06A-EM22-FD	11/06/19	SW-6020A	Dissolved	Thallium	0.33	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06B-EM22	11/06/19	SW-6020A	Dissolved	Selenium	0.81	ug/L	J	0.5	2	J	sp	Detect < PQL
440-254027-1	SWFTS-MW06B-EM22	11/06/19	SW-6020A	Dissolved	Thallium	0.36	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254051-1	SWFTS-MW10A-EM22	11/06/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-254051-1	SWFTS-MW14-EM22	11/06/19	EPA 300.1B	Total	Chlorate	28	ug/L	J	10	100	J	sp	Detect < PQL
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SM5310B	Total	Total Organic Carbon	3.6	mg/L	F1	0.65	1	J-	m	MS Recovery
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SW-6010B	Dissolved	Aluminum	0.065	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SW-6010B	Dissolved	Boron	2.2	mg/L		0.025	0.05	J	sd	Serial Dilution
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.004	mg/L	JB	0.0025	0.005	J	be,bf,bl,sp	EB, FB, Lab Blank, Detect < PQL
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SW-6010B	Dissolved	Iron	0.073	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SW-6010B	Dissolved	Molybdenum	0.086	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SW-6010B	Dissolved	Nickel	0.0096	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254051-1	SWFTS-MW13-EM22	11/06/19	SW-6010B	Dissolved	Barium	0.025	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-254051-1	SWFTS-MW13-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.065	mg/L	B	0.013	0.025	J+	be,bf,bl	EB, FB, Lab Blank
440-254051-1	SWFTS-MW14-EM22	11/06/19	SW-6010B	Dissolved	Aluminum	0.066	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254051-1	SWFTS-MW14-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.0058	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-254051-1	SWFTS-MW14-EM22	11/06/19	SW-6010B	Dissolved	Molybdenum	0.012	mg/L	J	0.01	0.02	J	bl,sp	Lab Blank, Detect < PQL
440-254051-1	SWFTS-MW14-EM22	11/06/19	SW-6010B	Dissolved	Phosphorus, Total	0.16	mg/L	J	0.1	0.2	J	sp	Detect < PQL
440-254051-1	SWFTS-MW15-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.033	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-254051-1	SWFTS-MW15-EM22	11/06/19	SW-6010B	Dissolved	Molybdenum	0.12	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254051-1	SWFTS-MW15-EM22	11/06/19	SW-6010B	Dissolved	Titanium	0.0046	mg/L	J	0.0025	0.005	J	sp	Detect < PQL

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-254051-1	SWFTS-MW16-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.022	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-254051-1	SWFTS-MW16-EM22	11/06/19	SW-6010B	Dissolved	Titanium	0.0026	mg/L	J	0.0025	0.005	J	sp	Detect < PQL
440-254051-1	SWFTS-MW18-EM22	11/06/19	SW-6010B	Dissolved	Aluminum	0.087	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254051-1	SWFTS-MW18-EM22	11/06/19	SW-6010B	Dissolved	Chromium	0.0057	mg/L	B	0.0025	0.005	J+	be,bf,bl	EB, FB, Lab Blank
440-254051-1	SWFTS-MW18-EM22	11/06/19	SW-6010B	Dissolved	Cobalt	0.0098	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254051-1	SWFTS-MW18-EM22	11/06/19	SW-6010B	Dissolved	Iron	0.052	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254051-1	SWFTS-MW10A-EM22	11/06/19	SW-6020A	Dissolved	Antimony	1.1	ug/L	J	0.5	2	J	sp	Detect < PQL
440-254148-1	SWFTS-MW02-EM22	11/07/19	EPA 300.0	Total	Nitrate [as N]	1.1	mg/L	U	1.1	2.2	R	brr	Better result reported
440-254148-1	SWFTS-MW02-EM22	11/07/19	EPA 300.0	Total	Sulfate	1400	mg/L	E	5	10	R	brr	Better result reported
440-254148-1	SWFTS-MW07A-EM22	11/07/19	EPA 300.0	Total	Sulfate	1400	mg/L	E	2.5	5	R	brr	Better result reported
440-254148-1	PC-58-EM22	11/07/19	SW-6010B	Dissolved	Aluminum	0.072	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254148-1	PC-58-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.016	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254148-1	PC-58-EM22	11/07/19	SW-6010B	Dissolved	Molybdenum	0.14	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254148-1	PC-58-EM22	11/07/19	SW-6010B	Dissolved	Zinc	0.013	mg/L	J	0.012	0.02	J	sp	Detect < PQL
440-254148-1	PC-88-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.0056	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254148-1	PC-88-EM22	11/07/19	SW-6010B	Dissolved	Molybdenum	0.026	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254148-1	PC-88-EM22	11/07/19	SW-6010B	Dissolved	Nickel	0.0081	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254148-1	PC-88-EM22-FD	11/07/19	SW-6010B	Dissolved	Chromium	0.0042	mg/L	JB	0.0025	0.005	J	be,bl,sp	EB, Lab Blank, Detect < PQL
440-254148-1	PC-88-EM22-FD	11/07/19	SW-6010B	Dissolved	Molybdenum	0.024	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254148-1	PC-88-EM22-FD	11/07/19	SW-6010B	Dissolved	Nickel	0.0071	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254148-1	SWFTS-20191107-EB	11/07/19	SW-6010B	Dissolved	Chromium	0.0048	mg/L	JB	0.0025	0.005	J	bl,sp	Lab Blank, Detect < PQL
440-254148-1	SWFTS-MW02-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.0049	mg/L	JB	0.0025	0.005	J	be,bl,sp	EB, Lab Blank, Detect < PQL
440-254148-1	SWFTS-MW02-EM22	11/07/19	SW-6010B	Dissolved	Cobalt	0.0055	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254148-1	SWFTS-MW02-EM22	11/07/19	SW-6010B	Dissolved	Iron	0.08	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254148-1	SWFTS-MW02-EM22	11/07/19	SW-6010B	Dissolved	Molybdenum	0.14	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254148-1	SWFTS-MW02-EM22	11/07/19	SW-6010B	Dissolved	Nickel	0.0096	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254148-1	SWFTS-MW07A-EM22	11/07/19	SW-6010B	Dissolved	Aluminum	0.06	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254148-1	SWFTS-MW07A-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.005	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254148-1	SWFTS-MW07A-EM22	11/07/19	SW-6010B	Dissolved	Molybdenum	0.11	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254148-1	SWFTS-MW07B-EM22	11/07/19	SW-6010B	Dissolved	Aluminum	0.073	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254148-1	SWFTS-MW07B-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.0087	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254148-1	SWFTS-MW07B-EM22	11/07/19	SW-6010B	Dissolved	Molybdenum	0.081	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254148-1	SWFTS-MW07B-EM22	11/07/19	SW-6010B	Dissolved	Nickel	0.005	mg/L	J	0.005	0.01	J	sp	Detect < PQL
440-254148-1	SWFTS-MW07B-EM22	11/07/19	SW-6010B	Dissolved	Zinc	0.013	mg/L	J	0.012	0.02	J	sp	Detect < PQL
440-254148-1	SWFTS-MW08A-EM22	11/07/19	SW-6010B	Dissolved	Aluminum	0.057	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254148-1	SWFTS-MW08A-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.042	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254148-1	SWFTS-MW08A-EM22	11/07/19	SW-6010B	Dissolved	Molybdenum	0.13	mg/L		0.01	0.02	J+	bl	Lab Blank
440-254148-1	SWFTS-MW02-EM22	11/07/19	SW-6020A	Dissolved	Selenium	0.99	ug/L	J	0.5	2	J	sp	Detect < PQL
440-254148-1	SWFTS-MW02-EM22	11/07/19	SW-6020A	Dissolved	Thallium	0.26	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254148-1	SWFTS-MW07B-EM22	11/07/19	SW-6020A	Dissolved	Thallium	0.24	ug/L	J	0.2	1	J	sp	Detect < PQL
440-254150-1	SWFTS-MW17-EM22	11/07/19	EPA 300.0	Total	Sulfate	2100	mg/L	E	2.5	5	R	brr	Better result reported
440-254150-1	SWFTS-MW12-EM22	11/07/19	EPA 300.1B	Total	Chlorate	88	ug/L	J	20	200	J	sp	Detect < PQL
440-254150-1	SWFTS-MW12-EM22	11/07/19	RSK175	Total	Methane	0.00025	mg/L	U	0.00025	0.00099	UJ	h,ph	Holding Time, Preservation
440-254150-1	SWFTS-20191107-FB	11/07/19	SW-6010B	Dissolved	Silicon	0.1	mg/L	J	0.1	0.2	J	sp	Detect < PQL
440-254150-1	SWFTS-20191107-FB	11/07/19	SW-6010B	Dissolved	Sodium	0.62	mg/L		0.26	0.5	J+	bl	Lab Blank
440-254150-1	SWFTS-MW04-EM22	11/07/19	SW-6010B	Dissolved	Zinc	0.016	mg/L	J	0.012	0.02	J	sp	Detect < PQL
440-254150-1	SWFTS-MW11-EM22	11/07/19	SW-6010B	Dissolved	Aluminum	0.062	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254150-1	SWFTS-MW11-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.017	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254150-1	SWFTS-MW11-EM22-FD	11/07/19	SW-6010B	Dissolved	Aluminum	0.066	mg/L	J	0.05	0.1	J	sp	Detect < PQL

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-254150-1	SWFTS-MW11-EM22-FD	11/07/19	SW-6010B	Dissolved	Chromium	0.017	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254150-1	SWFTS-MW11-EM22-FD	11/07/19	SW-6010B	Dissolved	Lead	0.0042	mg/L	J	0.0038	0.005	J	sp	Detect < PQL
440-254150-1	SWFTS-MW17-EM22	11/07/19	SW-6010B	Dissolved	Aluminum	0.079	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-254150-1	SWFTS-MW17-EM22	11/07/19	SW-6010B	Dissolved	Chromium	0.018	mg/L	B	0.0025	0.005	J+	be,bl	EB, Lab Blank
440-254150-1	SWFTS-MW17-EM22	11/07/19	SW-6010B	Dissolved	Zinc	0.013	mg/L	J	0.012	0.02	J	sp	Detect < PQL
440-254150-1	SWFTS-MW04-EM22	11/07/19	SW-6020A	Dissolved	Thallium	0.63	ug/L	J	0.2	1	J	sp	Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	RSK175	Total	Methane	0.084	mg/L		0.00025	0.00099	J	h,pH	Holding Time, Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	RSK175	Total	Methane	0.091	mg/L		0.00025	0.00099	J	h,pH	Holding Time, Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SM5310B	Total	Total Organic Carbon	610	mg/L		65	100	J-	h,pH	Holding Time, Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SM5310B	Total	Total Organic Carbon	610	mg/L		65	100	J-	h,pH	Holding Time, Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Aluminum	0.077	mg/L	J	0.05	0.1	J	pH,sp	Preservation, Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Barium	0.14	mg/L		0.005	0.01	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Beryllium	0.001	mg/L	U	0.001	0.002	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Boron	3.5	mg/L		0.025	0.05	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Cadmium	0.0025	mg/L	U	0.0025	0.005	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Calcium	440	mg/L	B	0.05	0.1	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Chromium	0.003	mg/L	J	0.0025	0.005	J	pH,sp	Preservation, Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Cobalt	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Copper	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Iron	0.088	mg/L	J	0.05	0.1	J	pH,sp	Preservation, Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Lead	0.0038	mg/L	U	0.0038	0.005	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Magnesium	240	mg/L	B	0.01	0.02	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Manganese	36	mg/L		0.03	0.04	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Total	Manganese	37	mg/L		0.075	0.1	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Molybdenum	0.01	mg/L	U	0.01	0.02	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Nickel	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Phosphorus, Total	1.6	mg/L		0.1	0.2	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Potassium	51	mg/L		0.25	0.5	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Silicon	34	mg/L		0.1	0.2	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Silver	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Sodium	670	mg/L		0.52	1	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Strontium	10	mg/L		0.01	0.02	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Tin	0.05	mg/L	U	0.05	0.1	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Titanium	0.0025	mg/L	U	0.0025	0.005	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Tungsten	0.05	mg/L	U	0.05	0.1	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Vanadium	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6010B	Dissolved	Zinc	0.012	mg/L	U	0.012	0.02	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Aluminum	0.08	mg/L	J	0.05	0.1	J	pH,sp	Preservation, Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Barium	0.13	mg/L		0.005	0.01	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Beryllium	0.001	mg/L	U	0.001	0.002	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Boron	3.2	mg/L		0.025	0.05	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Cadmium	0.0025	mg/L	U	0.0025	0.005	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Calcium	390	mg/L	B	0.05	0.1	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Chromium	0.0027	mg/L	J	0.0025	0.005	J	pH,sp	Preservation, Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Cobalt	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Copper	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Iron	0.074	mg/L	J	0.05	0.1	J	pH,sp	Preservation, Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Lead	0.0038	mg/L	U	0.0038	0.005	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Magnesium	220	mg/L	B	0.01	0.02	J-	pH	Preservation

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Manganese	32	mg/L		0.03	0.04	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Total	Manganese	37	mg/L		0.075	0.1	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Molybdenum	0.01	mg/L	U	0.01	0.02	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Nickel	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Phosphorus, Total	1.4	mg/L		0.1	0.2	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Potassium	46	mg/L		0.25	0.5	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Silicon	31	mg/L		0.1	0.2	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Silver	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Sodium	610	mg/L		0.52	1	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Strontium	9	mg/L		0.01	0.02	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Tin	0.05	mg/L	U	0.05	0.1	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Titanium	0.0025	mg/L	U	0.0025	0.005	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Tungsten	0.05	mg/L	U	0.05	0.1	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Vanadium	0.005	mg/L	U	0.005	0.01	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6010B	Dissolved	Zinc	0.019	mg/L	JB	0.012	0.02	J	bl,pH,sp	Lab Blank, Preservation, Detect < PQL
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6020A	Dissolved	Antimony	10	ug/L	U	10	40	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6020A	Dissolved	Arsenic	120	ug/L		10	20	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6020A	Dissolved	Selenium	330	ug/L		10	40	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R	11/26/19	SW-6020A	Dissolved	Thallium	4	ug/L	U	4	20	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6020A	Dissolved	Antimony	10	ug/L	U	10	40	UJ	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6020A	Dissolved	Arsenic	96	ug/L		10	20	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6020A	Dissolved	Selenium	390	ug/L		10	40	J-	pH	Preservation
440-255698-1	SWFTS-MW12-EM22-R-FD	11/26/19	SW-6020A	Dissolved	Thallium	4	ug/L	U	4	20	UJ	pH	Preservation
440-257635-1	SWFTS-MW10A-EM23	12/17/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-257635-1	SWFTS-MW20-EM23	12/17/19	EPA 300.1B	Total	Chlorate	30	ug/L	J	10	100	J	sp	Detect < PQL
440-257635-1	SWFTS-MW10A-EM23	12/17/19	EPA 314.0	Total	Perchlorate	4000	ug/L	F1	95	400	J+	m	MS Recovery
440-257733-1	COH-2B1-EM23	12/18/19	EPA 300.0	Total	Sulfate	1300	mg/L	E	0.5	1	R	brr	Better result reported
440-257733-1	SWFTS-MW05A-EM23	12/18/19	EPA 300.0	Total	Nitrate [as N]	28	mg/L	U	28	55	R	brr	Better result reported
440-257733-1	SWFTS-MW09A-EM23	12/18/19	EPA 300.0	Total	Nitrate [as N]	6.9	mg/L	F1	0.11	0.22	J+	m	MS Recovery
440-257733-1	SWFTS-MW09A-EM23	12/18/19	EPA 300.0	Total	Sulfate	1700	mg/L	E	0.5	1	R	brr	Better result reported
440-257733-1	COH-2B1-EM23	12/18/19	EPA 300.1B	Total	Chlorate	610	ug/L	F1	10	100	J-	m	MS Recovery
440-257866-1	PC-94-EM23	12/19/19	EPA 300.0	Total	Sulfate	1500	mg/L	E	2.5	5	R	brr	Better result reported
440-257866-1	SWFTS-MW08A-EM23	12/19/19	EPA 300.0	Total	Sulfate	1500	mg/L	E	2.5	5	R	brr	Better result reported
440-257866-1	SWFTS-MW19-EM23	12/19/19	EPA 300.0	Total	Nitrate [as N]	0.31	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-257866-1	SWFTS-MW19-EM23	12/19/19	EPA 300.0	Total	Sulfate	1000	mg/L	E	1.3	2.5	R	brr	Better result reported
440-257866-1	SWFTS-MW19-EM23-FD	12/19/19	EPA 300.0	Total	Nitrate [as N]	0.32	mg/L	J	0.28	0.55	J	sp	Detect < PQL
440-257866-1	SWFTS-MW23-EM23	12/19/19	EPA 300.0	Total	Sulfate	1300	mg/L	E	0.5	1	R	brr	Better result reported
440-257938-1	PC-58-EM23	12/20/19	EPA 300.0	Total	Sulfate	1300	mg/L	E	1.3	2.5	R	brr	Better result reported
440-257938-1	PC-97-EM23	12/20/19	EPA 300.0	Total	Sulfate	950	mg/L	E	0.5	1	R	brr	Better result reported
440-257938-1	SWFTS-MW12-EM23	12/20/19	EPA 300.0	Total	Sulfate	2.6	mg/L	J	2.5	5	J	sp	Detect < PQL
440-257938-1	SWFTS-MW13-EM23	12/20/19	EPA 300.0	Total	Sulfate	3200	mg/L	E	5	10	R	brr	Better result reported
440-257938-1	PC-97-EM23	12/20/19	EPA 300.1B	Total	Chlorate	48	ug/L	J	10	100	J	sp	Detect < PQL
440-257938-1	SWFTS-MW13-EM23	12/20/19	SM5310B	Total	Total Organic Carbon	0.84	mg/L	J	0.65	1	J	sp	Detect < PQL

Table 7 Field Duplicate Exceedances

SDG	Method	Parameter	Total or Dissolved	Units	Parent Sample ID	Result*	FD Result	RPD (%)	Allowed RPD (%)	Difference	PQL
440-242200-1	SW-6010B	Manganese	Total	mg/L	SWFTS-MW11-EM19	1.8	0.02 U	N/A	N/A	1.78	0.02
440-253891-1	SW-6010B	Zinc	Dissolved	mg/L	SWFTS-MW19-EM22	0.02 U	0.19	N/A	N/A	0.17	0.02

* For non-detects, the PQL was used.

Table 8 MS/MSD Recovery Exceedances

SDG	Spiked Sample	Lab Sample ID	Method	Total or Dissolved	Parameter	MS Recovery (%)	MSD Recovery (%)	Acceptance Range (%)
440-235000-1	SWFTS-MW09B-EM17	440-235000-1	EPA 300.0	Total	Nitrate [as N]	51	57	80-120
440-242014-1	SWFTS-MW16-EM19	440-242014-3	EPA 314.0	Total	Perchlorate	74	73	80-120
440-245046-1	SWFTS-MW06A-EM20	440-245046-5	EPA 300.1B	Total	Chlorate	70	71	75-125
440-245259-1	SWFTS-MW12-EM20	440-245259-4	EPA 300.0	Total	Nitrate [as N]	124	125	80-120
440-247878-2	PC-91-EM21	440-247878-1	EPA 314.0	Total	Perchlorate	117	122	80-120
440-253918-1	SWFTS-MW05A-EM22	440-253918-1	EPA 314.0	Total	Perchlorate	122	116	80-120
440-254051-1	SWFTS-MW10A-EM22	440-254051-1	SM5310B	Total	Total Organic Carbon	70	99	80-120
440-257635-1	SWFTS-MW10A-EM23	440-257635-11	EPA 314.0	Total	Perchlorate	131	118	80-120
440-257733-1	COH-2B1-EM23	440-257733-1	EPA 300.1B	Total	Chlorate	61	64	75-125
440-257733-1	SWFTS-MW09A-EM23	440-257733-5	EPA 300.0	Total	Nitrate [as N]	130	128	80-120

Table 9 Serial Dilution Exceedances

SDG	Sample ID	Total or Dissolved	Method	Parameter	Percent Difference	Allowed (%D)
440-242201-1	PC-88-EM19	Total	SW6010B	Manganese	12	10
440-242201-1	PC-88-EM19-FD	Total	SW6010B	Manganese	12	10
440-242201-1	SWFTS-MW23-EM19	Dissolved	SW6010B	Silicon	11	10
440-254051-1	SWFTS-MW10A-EM22	Dissolved	SW6010B	Boron	59	10

Table 10 Better Results Reported

SDG	Sample ID	Method	Parameter	Result	Units	Lab Qualifier	Validator Qualifier	Reason for Use of Alternate Result
440-228394-1	SWFTS-MW16-EM16	EPA 300.0	Sulfate	2000	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-228491-1	SWFTS-MW05A-EM16	EPA 300.0	Nitrate [as N]	16	mg/L	J	R	Dilution is too high. Better result reported from 5x dilution analysis.
440-228491-1	SWFTS-MW10A-EM16	EPA 300.0	Nitrate [as N]	11	mg/L	U	R	Dilution is too high. Better result reported from 5x dilution analysis.
440-228491-1	SWFTS-MW21-EM16	EPA 300.0	Sulfate	3500	mg/L	E	R	Exceeds calibration range. Better result reported from 500x dilution analysis.
440-228818-1	SWFTS-MW01-EM16	EPA 300.0	Sulfate	1900	mg/L	E	R	Exceeds calibration range. Better result reported from 100x dilution analysis.
440-228887-1	SWFTS-MW06A-EM16-FD	EPA 300.0	Sulfate	1100	mg/L	E	R	Exceeds calibration range. Better result reported from 100x dilution analysis.
440-228887-1	SWFTS-MW23-EM16	EPA 300.0	Sulfate	1100	mg/L	E	R	Exceeds calibration range. Better result reported from 100x dilution analysis.
440-229018-1	SWFTS-MW08A-EM16	EPA 300.0	Sulfate	1600	mg/L	E	R	Exceeds calibration range. Better result reported from 500x dilution analysis.
440-229018-1	SWFTS-MW11-EM16	EPA 300.0	Sulfate	2200	mg/L	E	R	Exceeds calibration range. Better result reported from 500x dilution analysis.
440-229111-1	SWFTS-MW07B-EM16	EPA 300.0	Sulfate	1100	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-234812-1	SWFTS-MW10A-EM17	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Dilution is too high. Analyte not detected. Result reported from 20x dilution analysis.
440-234933-1	SWFTS-MW06A-EM17	EPA 300.0	Sulfate	1000	mg/L	E	R	Exceeded calibration range. Better result reported from 100x dilution analysis.
440-234938-1	SWFTS-MW05A-EM17	EPA 300.0	Nitrate [as N]	35	mg/L	J	R	Better result reported from 20x dilution analysis. This is an estimated value.
440-235000-1	PC-88-EM17	EPA 300.0	Sulfate	920	mg/L	E	R	Exceeded calibration range. Better result reported from 200x dilution analysis.
440-235000-1	SWFTS-MW08A-EM17	EPA 300.0	Sulfate	1700	mg/L	E	R	Exceeded calibration range. Better result reported from 500x dilution analysis.
440-235000-1	SWFTS-MW09B-EM17	EPA 300.0	Sulfate	1700	mg/L	E	R	Exceeded calibration range. Better result reported from 500x dilution analysis.
440-235000-1	SWFTS-MW17-EM17	EPA 300.0	Sulfate	2600	mg/L	E	R	Exceeded calibration range. Better result reported from 200x dilution analysis.
440-235133-1	PC-58-EM17	EPA 300.0	Sulfate	2100	mg/L	E	R	Exceeded calibration range. Better result reported from 100x dilution analysis.
440-235133-1	SWFTS-MW04-EM17	EPA 300.0	Sulfate	1100	mg/L	E	R	Exceeded calibration range. Better result reported from 100x dilution analysis.
440-238531-1	SWFTS-MW03-EM18	EPA 300.0	Sulfate	2600	mg/L	E	R	Exceeded calibration. Better result reported from 500x dilution.
440-238531-1	SWFTS-MW05A-EM18	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Dilution too high. Better result reported from 20x dilution.
440-238531-1	SWFTS-MW09A-EM18	EPA 300.0	Sulfate	1700	mg/L	E	R	Exceeded calibration. Better result reported from 500x dilution.
440-238544-1	SWFTS-MW06B-EM18	EPA 300.0	Sulfate	900	mg/L	E	R	Exceeded calibration. Better result reported from 100x dilution.
440-238544-1	SWFTS-MW10A-EM18	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Dilution too high. Better result reported from 10x dilution.
440-238544-1	SWFTS-MW19-EM18-FD	EPA 300.0	Sulfate	1100	mg/L	E	R	Exceeded calibration. Better result reported from 200x dilution.
440-238688-1	SWFTS-MW22-EM18	EPA 300.0	Sulfate	1100	mg/L	E	R	Exceeded calibration. Better result reported from 200x dilution.
440-242084-1	PC-91-EM19	EPA 314.0	Perchlorate	130	ug/L	E	R	Exceeded calibration. Better result reported from 10x dilution.
440-242084-1	PC-92-EM19	EPA 300.0	Sulfate	1000	mg/L	E	R	Exceeded calibration. Better result reported from 100x dilution.
440-242084-1	SWFTS-MW01-EM19	EPA 300.0	Sulfate	1500	mg/L	E	R	Exceeded calibration. Better result reported from 500x dilution.
440-242084-1	SWFTS-MW05A-EM19	EPA 300.0	Nitrate [as N]	35	mg/L	J	R	Estimated. Used for lab QC only. Better result reported from 10x dilution analysis.
440-242084-1	SWFTS-MW10A-EM19	EPA 300.0	Nitrate [as N]	11	mg/L	U	R	Analyte not detected. Better result reported from 10x dilution analysis.
440-242084-1	SWFTS-MW22-EM19	EPA 300.0	Sulfate	1200	mg/L	E	R	Exceeded calibration. Better result reported from 200x dilution.
440-242198-1	SWFTS-MW24-EM19	EPA 300.0	Sulfate	2100	mg/L	E	R	Exceeded calibration. Better result reported from 500x dilution.
440-242200-1	SWFTS-MW09A-EM19	EPA 300.0	Sulfate	1800	mg/L	E	R	Exceeded calibration. Better result reported from 500x dilution.
440-242200-1	SWFTS-MW11-EM19-FD	EPA 300.0	Sulfate	2000	mg/L	E	R	Exceeded calibration. Better result reported from 500x dilution.
440-242201-1	PC-97-EM19	EPA 300.0	Sulfate	1300	mg/L	E	R	Exceeded calibration. Better result reported from 100x dilution.
440-245046-1	SWFTS-MW06B-EM20	EPA 300.0	Sulfate	1100	mg/L	E	R	Exceeds calibration range. Better result reported from 100x dilution analysis.
440-245046-1	SWFTS-MW10A-EM20	EPA 300.0	Nitrate [as N]	11	mg/L	U	R	Dilution is too high. Analyte not detected. Result reported from 10x dilution analysis.
440-245068-1	SWFTS-MW05A-EM20	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Dilution is too high. Analyte not detected. Result reported from 10x dilution analysis.
440-245068-1	SWFTS-MW05B-EM20	EPA 300.0	Sulfate	2400	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-245068-1	SWFTS-MW24-EM20	EPA 300.0	Sulfate	2200	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-245153-1	SWFTS-MW19-EM20	EPA 300.0	Sulfate	1000	mg/L	E	R	Exceeds calibration range. Better result reported from 50x dilution analysis.
440-245153-1	SWFTS-MW22-EM20	EPA 300.0	Sulfate	1200	mg/L	E	R	Exceeds calibration range. Better result reported from 100x dilution analysis.
440-245218-1	SWFTS-MW07A-EM20	EPA 300.0	Sulfate	1400	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-245218-1	SWFTS-MW11-EM20-FD	EPA 300.0	Sulfate	1900	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-245259-1	SWFTS-MW12-EM20	EPA 300.0	Sulfate	3800	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-245261-1	PC-58-EM20	EPA 300.0	Sulfate	1700	mg/L	E	R	Exceeds calibration range. Better result reported from 100x dilution analysis.
440-245261-1	PC-97-EM20	EPA 300.0	Sulfate	1300	mg/L	E	R	Exceeds calibration range. Better result reported from 100x dilution analysis.
440-247878-1	SWFTS-MW10A-EM21	EPA 300.0	Nitrate [as N]	11	mg/L	U	R	Dilution too high. Better result reported from 10x dilution.
440-247965-1	SWFTS-MW05A-EM21	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Dilution too high. Better result reported from 20x dilution.
440-248104-1	SWFTS-MW06A-EM21-FD	EPA 300.0	Sulfate	1300	mg/L	E	R	Exceeded calibration. Better result reported from 200x dilution.
440-248187-1	COH-2B1-EM21	EPA 300.0	Sulfate	1300	mg/L	E	R	Exceeded calibration. Better result reported from 200x dilution.
440-248187-1	SWFTS-MW07A-EM21	EPA 300.0	Sulfate	1400	mg/L	E	R	Exceeded calibration. Better result reported from 200x dilution.

Table 10 Better Results Reported

SDG	Sample ID	Method	Parameter	Result	Units	Lab Qualifier	Validator Qualifier	Reason for Use of Alternate Result
440-248259-1	SWFTS-MW13-EM21	EPA 300.0	Sulfate	3400	mg/L	E	R	Exceeded calibration. Better result reported from 500x dilution.
440-253773-1	COH-2B1-EM22	EPA 300.0	Sulfate	1600	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-253891-1	SWFTS-MW09A-EM22	EPA 300.0	Sulfate	1500	mg/L	E	R	Exceeds calibration range. Better result reported from 500x dilution analysis.
440-253891-1	SWFTS-MW19-EM22-FD	EPA 300.0	Sulfate	990	mg/L	E	R	Exceeds calibration range. Better result reported from 200x dilution analysis.
440-253918-1	SWFTS-MW05A-EM22	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Analyte not detected. Better result reported from 20x dilution analysis.
440-254051-1	SWFTS-MW10A-EM22	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Analyte not detected. Used for lab QC. Result reported from 10x dilution analysis.
440-254148-1	SWFTS-MW02-EM22	EPA 300.0	Nitrate [as N]	1.1	mg/L	U	R	Analyte not detected. Used for lab QC. Result reported from 20x dilution analysis.
440-254148-1	SWFTS-MW02-EM22	EPA 300.0	Sulfate	1400	mg/L	E	R	Exceeds calibration range. Better result reported from 500x dilution analysis.
440-254148-1	SWFTS-MW07A-EM22	EPA 300.0	Sulfate	1400	mg/L	E	R	Exceeds calibration range. Better result reported from 500x dilution analysis.
440-254150-1	SWFTS-MW17-EM22	EPA 300.0	Sulfate	2100	mg/L	E	R	Exceeds calibration range. Better result reported from 500x dilution analysis.
440-257635-1	SWFTS-MW10A-EM23	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Better result reported from 10x dilution analysis. Used for QC only.
440-257733-1	COH-2B1-EM23	EPA 300.0	Sulfate	1300	mg/L	E	R	Exceeded calibration range. Better result reported from 100x dilution run.
440-257733-1	SWFTS-MW05A-EM23	EPA 300.0	Nitrate [as N]	28	mg/L	U	R	Better result reported from 10x dilution analysis. Used for QC only.
440-257733-1	SWFTS-MW09A-EM23	EPA 300.0	Sulfate	1700	mg/L	E	R	Exceeded calibration range. Better result reported from 100x dilution run.
440-257866-1	PC-94-EM23	EPA 300.0	Sulfate	1500	mg/L	E	R	Exceeded calibration range. Better result reported from 200x dilution run.
440-257866-1	SWFTS-MW08A-EM23	EPA 300.0	Sulfate	1500	mg/L	E	R	Exceeded calibration range. Better result reported from 500x dilution run.
440-257866-1	SWFTS-MW19-EM23	EPA 300.0	Sulfate	1000	mg/L	E	R	Exceeded calibration range. Better result reported from 200x dilution run.
440-257866-1	SWFTS-MW23-EM23	EPA 300.0	Sulfate	1300	mg/L	E	R	Exceeded calibration range. Better result reported from 100x dilution run.
440-257938-1	PC-58-EM23	EPA 300.0	Sulfate	1300	mg/L	E	R	Exceeded calibration range. Better result reported from 200x dilution run.
440-257938-1	PC-97-EM23	EPA 300.0	Sulfate	950	mg/L	E	R	Exceeded calibration range. Better result reported from 100x dilution run.
440-257938-1	SWFTS-MW13-EM23	EPA 300.0	Sulfate	3200	mg/L	E	R	Exceeded calibration range. Better result reported from 500x dilution run.

Table 11 Sample Preservation Infractions

SDG	Sample ID	Method	Parameter	Item	Outlier	Criteria
440-254150-1	SWFTS-MW12-EM22	RSK175	Methane	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	RSK175	Methane	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SM5310B	Total Organic Carbon	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Aluminum	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Barium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Beryllium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Boron	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Cadmium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Calcium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Chromium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Cobalt	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Copper	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Iron	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Lead	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Magnesium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Manganese	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Manganese	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Molybdenum	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Nickel	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Phosphorus, Total	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Potassium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Silicon	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Silver	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Sodium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Strontium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Tin	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Titanium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Tungsten	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Vanadium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6010B	Zinc	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6020A	Antimony	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6020A	Arsenic	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6020A	Selenium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R	SW-6020A	Thallium	Preservation	pH > 2	pH < 2

Table 11 Sample Preservation Infractions

SDG	Sample ID	Method	Parameter	Item	Outlier	Criteria
440-255698-1	SWFTS-MW12-EM22-R-FD	RSK175	Methane	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SM5310B	Total Organic Carbon	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Aluminum	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Barium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Beryllium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Boron	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Cadmium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Calcium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Chromium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Cobalt	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Copper	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Iron	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Lead	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Magnesium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Manganese	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Manganese	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Molybdenum	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Nickel	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Phosphorus, Total	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Potassium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Silicon	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Silver	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Sodium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Strontium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Tin	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Titanium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Tungsten	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Vanadium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6010B	Zinc	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6020A	Antimony	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6020A	Arsenic	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6020A	Selenium	Preservation	pH > 2	pH < 2
440-255698-1	SWFTS-MW12-EM22-R-FD	SW-6020A	Thallium	Preservation	pH > 2	pH < 2

Table 12 Holding Time Exceedances

SDG	Sample ID	Method	Total or Dissolved	Parameter	Time Limit	Time Elapsed
440-238618-1	COH-2B1-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	59.9 hours
440-238618-1	PC-58-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	59.7 hours
440-238618-1	PC-88-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	59.5 hours
440-238618-1	PC-88-EM18-FD	EPA 300.0	Total	Nitrate [as N]	48 hours	60 hours
440-238618-1	PC-97-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	59.9 hours
440-238618-1	SWFTS-20190409-FB	EPA 300.0	Total	Nitrate [as N]	48 hours	57.9 hours
440-238618-1	SWFTS-MW02-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	57.2 hours
440-238618-1	SWFTS-MW04-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	58.1 hours
440-238618-1	SWFTS-MW14-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	56.8 hours
440-238618-1	SWFTS-MW15-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	59.8 hours
440-238618-1	SWFTS-MW16-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	59.6 hours
440-238618-1	SWFTS-MW18-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	59.2 hours
440-238618-1	SWFTS-MW20-EM18	EPA 300.0	Total	Nitrate [as N]	48 hours	55.9 hours
440-254150-1	SWFTS-MW12-EM22	RSK175	Total	Methane	7 days	12.4 days
440-255698-1	SWFTS-MW12-EM22-R	RSK175	Total	Methane	7 days	8.3 days
440-255698-1	SWFTS-MW12-EM22-R-FD	RSK175	Total	Methane	7 days	8.3 days
440-255698-1	SWFTS-MW12-EM22-R	SM5310B	Total	Total Organic Carbon	4 hours	73.9 hours
440-255698-1	SWFTS-MW12-EM22-R-FD	SM5310B	Total	Total Organic Carbon	4 hours	74.2 hours

Table 13 Laboratory Blank Detections

SDG	Sample ID	Method	Parameter	Result	Units	Associated Samples with Qualification
440-242014-1	CCB 440-549949/17	SW-6010B	Magnesium	0.0138	mg/L	SWFTS-20190520-FB
440-242014-1	MB 440-548947/1-A	SW-6010B	Sodium	0.364	mg/L	SWFTS-20190520-FB
440-253773-1	MB 440-578658/1-A	SW-6010B	Chromium	0.0047	mg/L	COH-2B1-EM22, SWFTS-MW03-EM22, SWFTS-MW21-EM22
440-253773-1	MB 440-578658/1-A	SW-6010B	Titanium	0.0034	mg/L	COH-2B1-EM22
440-253891-1	MB 440-578658/1-A	SW-6010B	Chromium	0.0047	mg/L	SWFTS-MW09A-EM22, SWFTS-MW09B-EM22, SWFTS-MW19-EM22, SWFTS-MW19-EM22-FD, SWFTS-MW22-EM22, SWFTS-MW23-EM22, SWFTS-MW24-EM22
440-253891-1	CCB 440-579507/24	SW-6010B	Molybdenum	0.0112	mg/L	SWFTS-MW19-EM22, SWFTS-MW19-EM22-FD, SWFTS-MW23-EM22
440-253891-1	MB 440-578658/1-A	SW-6010B	Titanium	0.0034	mg/L	SWFTS-MW22-EM22
440-253918-1	CCB 440-579073/27	SW6020A	Antimony	0.74	ug/L	SWFTS-MW05A-EM22
440-253918-1	MB 440-578831/1-A	SW-6010B	Chromium	0.0049	mg/L	SWFTS-20191105-EB, SWFTS-20191105-FB, SWFTS-MW01-EM22, SWFTS-MW05A-EM22, SWFTS-MW05B-EM22, SWFTS-MW20-EM22, SWFTS-MW25-EM22
440-254027-1	CCB 440-579095/43	SW-6010B	Molybdenum	0.0127	mg/L	PC-92-EM22, PC-97-EM22, SWFTS-MW06A-EM22, SWFTS-MW06A-EM22-FD, SWFTS-MW06B-EM22
440-254027-1	MB 440-578831/1-A	SW-6010B	Chromium	0.0049	mg/L	PC-92-EM22, PC-94-EM22, PC-97-EM22, SWFTS-MW06A-EM22, SWFTS-MW06A-EM22-FD, SWFTS-MW06B-EM22
440-254051-1	CCB 440-579507/37	SW-6010B	Molybdenum	0.0145	mg/L	SWFTS-MW10A-EM22, SWFTS-MW14-EM22, SWFTS-MW15-EM22
440-254051-1	MB 440-579100/1-A	SW-6010B	Chromium	0.0044	mg/L	SWFTS-MW10A-EM22, SWFTS-MW13-EM22, SWFTS-MW14-EM22, SWFTS-MW15-EM22, SWFTS-MW16-EM22, SWFTS-MW18-EM22
440-254148-1	CCB 440-579375/36	SW-6010B	Molybdenum	0.0149	mg/L	PC-58-EM22
440-254148-1	CCB2 440-579507/50	SW-6010B	Molybdenum	0.0163	mg/L	PC-88-EM22, PC-88-EM22-FD, SWFTS-MW02-EM22, SWFTS-MW07A-EM22, SWFTS-MW07B-EM22, SWFTS-MW08A-EM22
440-254148-1	MB 440-579100/1-A	SW-6010B	Chromium	0.0044	mg/L	PC-88-EM22, PC-88-EM22-FD, SWFTS-20191107-EB, SWFTS-MW02-EM22, SWFTS-MW07A-EM22, SWFTS-MW07B-EM22, SWFTS-MW08A-EM22
440-254148-1	MB 440-579115/1-A	SW-6010B	Chromium	0.0048	mg/L	PC-58-EM22
440-254150-1	CCB 440-579507/37	SW-6010B	Sodium	0.282	mg/L	SWFTS-20191107-FB
440-254150-1	MB 440-579100/1-A	SW-6010B	Chromium	0.0044	mg/L	SWFTS-MW11-EM22, SWFTS-MW11-EM22-FD, SWFTS-MW17-EM22
440-255698-1	MB 440-583249/1-A	SW-6010B	Zinc	0.0127	mg/L	SWFTS-MW12-EM22-R-FD

Table 14 Equipment Blank and Field Blank Detections

SDG*	Sample ID	Blank Type	Sample Date	Method	Total or Dissolved	Parameter	Result	Units	Associated Samples with Qualification
440-228491-1	SWFTS-20181220-EB	EB	12/20/2018	EPA 300.0	Total	Sulfate	0.49	mg/L	SWFTS-MW02-EM16, SWFTS-MW14-EM16, SWFTS-MW20-EM16
440-235133-1	SWFTS-20190301-FB	FB	3/1/2019	EPA 314.0	Total	Perchlorate	1.4	ug/L	PC-58-EM17, SWFTS-MW04-EM17, SWFTS-MW11-EM17, SWFTS-MW11-EM17-FD
440-253918-1	SWFTS-20191105-EB	EB	11/5/2019	SW-6010B	Dissolved	Chromium	0.0068	mg/L	PC-92-EM22, PC-94-EM22, PC-97-EM22, SWFTS-MW01-EM22, SWFTS-MW05A-EM22, SWFTS-MW05B-EM22, SWFTS-MW06A-EM22, SWFTS-MW06A-EM22-FD, SWFTS-MW06B-EM22, SWFTS-MW10A-EM22, SWFTS-MW13-EM22, SWFTS-MW14-EM22, SWFTS-MW15-EM22, SWFTS-MW16-EM22, SWFTS-MW18-EM22, SWFTS-MW20-EM22, SWFTS-MW25-EM22
440-253918-1	SWFTS-20191105-FB	FB	11/5/2019	SW-6010B	Dissolved	Chromium	0.0057	mg/L	PC-92-EM22, PC-94-EM22, PC-97-EM22, SWFTS-MW01-EM22, SWFTS-MW05A-EM22, SWFTS-MW05B-EM22, SWFTS-MW06A-EM22, SWFTS-MW06A-EM22-FD, SWFTS-MW06B-EM22, SWFTS-MW10A-EM22, SWFTS-MW13-EM22, SWFTS-MW14-EM22, SWFTS-MW15-EM22, SWFTS-MW16-EM22, SWFTS-MW18-EM22, SWFTS-MW20-EM22, SWFTS-MW25-EM22
440-254148-1	SWFTS-20191107-EB	EB	11/7/2019	SW-6010B	Dissolved	Chromium	0.0048	mg/L	PC-58-EM22, PC-88-EM22, PC-88-EM22-FD, SWFTS-MW02-EM22, SWFTS-MW07A-EM22, SWFTS-MW07B-EM22, SWFTS-MW08A-EM22, SWFTS-MW11-EM22, SWFTS-MW11-EM22-FD, SWFTS-MW17-EM22

* SDG of EB or FB, which may differ from associated samples.

Table 15 Completeness Summary

Method	Total Number of Validated Results	Number of Rejected Results	Percent Completeness
EPA 300.0	708	0	100.00%
EPA 300.1B	354	0	100.00%
EPA 314.0	354	0	100.00%
RSK175	46	0	100.00%
SM5310B	354	0	100.00%
SW-6010B	2430	0	100.00%
SW-6020A	360	0	100.00%

Appendix 1
Validation Checklists

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 1

SDG/Report No.: 440-228394-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify results detected between the MDL/SQL and RL/PQL"J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW16-EM16: Qualify unused result "R".

Multiple results: SWFTS-MW16-EM16 was analyzed twice for sulfate. The initial 10x dilution analysis result was not used because sulfate was outside the calibration range of the instrument. The 200x dilution analysis result was used because the re-analysis results were within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Results qualified "J" are useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW16-EM16	440-228394-1	12/19/2018	4.4 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recovery was high in the MS/MSD of SWFTS-MW16-EM16. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 02/11/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 17 with MS/MSDs

SDG/Report No.: 440-228491-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	SWFTS-MW14-EM16, SWFTS-MW02-EM16, and SWTFS-MW20-EM16: Qualify sulfate "J+"
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results detected between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW21-EM16, SWFTS-MW05A-EM16, SWFTS-MW10A-EM16: Qualify unused results "R".

Multiple results: SWFTS-MW21-EM16 was analyzed twice for sulfate. The initial 10x analysis was not used because sulfate was outside the calibration range of the instrument. The 500x dilution analysis was used because the re-analysis results were within the calibration range.
SWFTS-MW05A-EM16 and SWFTS-MW10A-EM16 were analyzed twice for nitrate. The 200x analyses were not used because the dilution was too high. Results were estimated or ND.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Sample results qualified as estimated (J, J+) are useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW15-EM16	440-228491-1	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW14-EM16	440-228491-2	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW02-EM16	440-228491-3	12/20/2018	3.9 ºC/4.3 ºC
PC-91-EM16	440-228491-4	12/20/2018	3.9 ºC/4.3 ºC
PC-92-EM16	440-228491-5	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW10A-EM16	440-228491-6	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW10A-EM16-MS	440-228491-6 MS	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW10A-EM16-MSD	440-228491-6 MSD	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW20-EM16	440-228491-7	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW18-EM16	440-228491-8	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-20181220-EB	440-228491-9	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-20181220-FB	440-228491-10	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW05A-EM16	440-228491-11	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW05A-EM16-MS	440-228491-11 MS	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW05A-EM16-MSD	440-228491-11 MSD	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW05B-EM16	440-228491-12	12/20/2018	3.9 ºC/4.3 ºC
SWFTS-MW21-EM16	440-228491-13	12/20/2018	3.9 ºC/4.3 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
300.0: Sulfate was detected in SWFTS-20181220-EB. EB value was adjusted for dilution to assess contamination. Three results were <10x the amount in the adjusted EB and were qualified.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW05A-EM16. Chlorate concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/16/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 5

SDG/Report No.: 440-228818-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW01-EM16: Qualify unused result "R".

Multiple results: SWFTS-MW01-EM16 was analyzed twice for sulfate. The initial 2x dilution analysis was not used because sulfate was outside the calibration range of the instrument. The 100x dilution analysis was used because the re-analysis result was within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW01-EM16	440-228818-1	12/27/2018	3.1 ºC
SWFTS-MW22-EM16	440-228818-2	12/27/2018	3.1 ºC
SWFTS-MW19-EM16	440-228818-3	12/27/2018	3.1 ºC
SWFTS-MW19-EM16-FD	440-228818-4	12/27/2018	3.1 ºC
SWFTS-MW09A-EM16	440-228818-5	12/27/2018	3.1 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate and nitrate recoveries were high in the MS/MSD of SWFTS-MW101-EM16. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW101-EM16 and the MSD of SWFTS-MW22-EM16. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/22/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 8

SDG/Report No.: 440-228887-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW06A-EM16-FD and SWFTS-MW23-EM16: Qualify unused results "R".

Multiple results: SWFTS-MW06A-EM16-FD and SWFTS-MW23-EM16 were analyzed twice for sulfate. The initial 2x dilution analyses were not used because sulfate was outside the calibration range of the instrument. The 100x dilution analyses were used because the re-analysis results were within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW09B-EM16	440-228887-1	12/28/2018	1.9 ºC
PC-94-EM16	440-228887-2	12/28/2018	1.9 ºC
SWFTS-MW06A-EM16	440-228887-3	12/28/2018	1.9 ºC
SWFTS-MW06A-EM16-FD	440-228887-4	12/28/2018	1.9 ºC
SWFTS-MW06B-EM16	440-228887-5	12/28/2018	1.9 ºC
SWFTS-MW23-EM16	440-228887-6	12/28/2018	1.9 ºC
SWFTS-20181228-EB	440-228887-7	12/28/2018	1.9 ºC
SWFTS-20181228-FB	440-228887-8	12/28/2018	1.9 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MS/MSD of SWFTS-MW06A-EM16-FD and SWFTS-MW23-EM16. Sulfate concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/22/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 10

SDG/Report No.: 440-229018-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW08A-EM16 and SWFTS-MW11-EM16: Qualify unused results "R".

Multiple results: SWFTS-MW08A-EM16 and SWFTS-MW11-EM16 were analyzed twice for sulfate. The initial 10x dilution analyses were not used because sulfate was outside the calibration range of the instrument. The 500x dilution analyses were used because the re-analysis results were within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW25-EM16	440-229018-1	01/02/2019	2.1 ºC
SWFTS-MW24-EM16	440-229018-2	01/02/2019	2.1 ºC
SWFTS-MW03-EM16	440-229018-3	01/02/2019	2.1 ºC
SWFTS-MW08A-EM16	440-229018-4	01/02/2019	2.1 ºC
SWFTS-MW17-EM16	440-229018-5	01/02/2019	2.1 ºC
SWFTS-MW13-EM16	440-228818-6	01/02/2019	2.1 ºC
SWFTS-MW12-EM16	440-229018-7	01/02/2019	2.1 ºC
SWFTS-MW11-EM16	440-229018-8	01/02/2019	2.1 ºC
SWFTS-MW11-EM16-FD	440-229018-9	01/02/2019	2.1 ºC
SWFTS-MW07A-EM16	440-229018-10	01/02/2019	2.1 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MS/MSDs of SWFTS-MW08A-EM16 and SWFTS-MW11-EM16. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSDs of SWFTS-MW25-EM16 and SWFTS-MW13-EM16. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/22/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7

SDG/Report No.: 440-229111-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW07B-EM16: Qualify unused result "R".

Multiple results: SWFTS-MW07B-EM16 was analyzed twice for sulfate. The initial 10x dilution analysis was not used because sulfate was outside the calibration range of the instrument. The 200x dilution analysis was used because the re-analysis result was within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW07B-EM16	440-229111-1	01/03/2019	1.5 ºC
SWFTS-MW04-EM16	440-229111-2	01/03/2019	1.5 ºC
PC-97-EM16	440-229111-3	01/03/2019	1.5 ºC
COH-2B1-EM16	440-229111-4	01/03/2019	1.5 ºC
PC-88-EM16	440-229111-5	01/03/2019	1.5 ºC
PC-88-EM16-FD	440-229111-6	01/03/2019	1.5 ºC
PC-58-EM16	440-229111-7	01/03/2019	1.5 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Sample receipt at TALVS used incorrect year when accepting the samples.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
Outliers were unrelated or in another SDG.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 02/11/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 3

SDG/Report No.: 440-234705-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate		X	No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			

Overall Assessment: Acceptable as qualified.
Usability: Qualified results (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW15-EM17	440-234705-1	2/25/2019	1.7 ºC
COH-2B1-EM17	440-234705-2	2/25/2019	1.7 ºC
SWFTS-MW02-EM17	440-234705-3	2/25/2019	1.7 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/N/A

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 03/19/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 14 with MS/MSD

SDG/Report No.: 440-234812-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify results detected between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW10A-EM17: Qualify unused result "R".

Multiple results: SWFTS-MW10A-EM17 was analyzed twice for nitrate. The initial 20x analyses was used because nitrate was detected. The 500x dilution analysis was not used because the dilution was too high and nitrate was not detected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Sample results qualified as estimated (J) are useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW14-EM17	440-234812-1	2/26/2019	2.0 ºC
PC-92-EM17	440-234812-2	2/26/2019	2.0 ºC
PC-91-EM17	440-234812-3	2/26/2019	2.0 ºC
SWFTS-MW10A-EM17	440-234812-4	2/26/2019	2.0 ºC
SWFTS-MW10A-EM17-MS	440-234812-4 MS	2/26/2019	2.0 ºC
SWFTS-MW10A-EM17-MSD	440-234812-4 MSD	2/26/2019	2.0 ºC
SWFTS-MW20-EM17	440-234812-5	2/26/2019	2.0 ºC
SWFTS-20190226-FB	440-234812-6	2/26/2019	2.0 ºC
SWFTS-MW16-EM17	440-234812-7	2/26/2019	2.0 ºC
SWFTS-20190226-EB	440-234812-8	2/26/2019	2.0 ºC
SWFTS-MW18-EM17	440-234812-9	2/26/2019	2.0 ºC
SWFTS-MW21-EM17	440-234812-10	2/26/2019	2.0 ºC
SWFTS-MW01-EM17	440-234812-11	2/26/2019	2.0 ºC
SWFTS-MW09A-EM17	440-234812-12	2/26/2019	2.0 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW10A-EM17. Chlorate recoveries were high in the MS/MSD of SWFTS-MW09A-EM17. Chlorate concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 03/25/19

Project Name: SWF Area Treatability Study
SDG/Report No.: 440-234933-1
Task No.: M11
Lab ID: Test America
No. of Samples: 8
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW06A-EM17: Qualify unused result "R".

Multiple results: SWFTS-MW06A-EM17 was analyzed twice for sulfate. The initial 2x dilution analysis was not used because sulfate was outside the calibration range of the instrument. The 100x dilution analysis was used because the re-analysis result was within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Qualified results (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW19-EM17	440-234933-1	2/27/2019	2.3 ºC
SWFTS-MW19-EM17-FD	440-234933-2	2/27/2019	2.3 ºC
SWFTS-MW22-EM17	440-234933-3	2/27/2019	2.3 ºC
SWFTS-MW23-EM17	440-234933-4	2/27/2019	2.3 ºC
SWFTS-MW25-EM17	440-234933-5	2/27/2019	2.3 ºC
SWFTS-MW06A-EM17	440-234933-6	2/27/2019	2.3 ºC
SWFTS-MW06A-EM17-FD	440-234933-7	2/27/2019	2.3 ºC
SWFTS-20190227-EB	440-234933-8	2/27/2019	2.3 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recovery was high in the MSD of SWFTS-MW06A-EM17. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 03/18/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7 with MS/MSD

SDG/Report No.: 440-234938-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW05A-EM17: Qualify unused result "R".

Multiple results: SWFTS-MW05A-EM17 was analyzed twice for nitrate. The initial 20x dilution analysis result was not qualified. The 500x result was between the SQL and PQL, estimated, but at a higher concentration than the 20x run. It was used to evaluate MS/MSD. The initial unqualified result is more technically sound and will be used. Nitrate is not a contaminant of concern.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample result qualified "R" should not be used. Qualified results (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
PC-94-EM17	440-234938-1	2/27/2019	2.3 ºC
SWFTS-MW24-EM17	440-234938-2	2/27/2019	2.3 ºC
SWFTS-MW03-EM17	440-234938-3	2/27/2019	2.3 ºC
SWFTS-MW05B-EM17	440-234938-4	2/27/2019	2.3 ºC
SWFTS-MW05A-EM17	440-234938-5	2/27/2019	2.3 ºC
SWFTS-MW05A-EM17-MS	440-234938-5 MS	2/27/2019	2.3 ºC
SWFTS-MW05A-EM17-MSD	440-234938-5 MSD	2/27/2019	2.3 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	No/Yes
Label and COC did not match for PC-94-EM17. Sample ID from the label was used.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.1B: Chlorate recoveries were low in the MS/MSDs of PC-94-EM17 and SWFTS-MW05A-EM17. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/NA/NA

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 03/20/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 11

SDG/Report No.: 440-235000-1
Lab ID: Test America
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW09B-EM17: Qualify nitrate "J-"
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW09B-EM17, SWFTS-MW17-EM17, SWFTS-MW08A-EM17, and PC-88-EM17: Qualify unused results "R".

Multiple results: SWFTS-MW09B-EM17, SWFTS-MW17-EM17, SWFTS-MW08A-EM17, and PC-88-EM17 were analyzed twice for sulfate. The initial analyses were not used because sulfate was outside the calibration range of the instrument. The dilution analyses were used because the re-analysis results were within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Sample results qualified as estimated (J-) are useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW09B-EM17	440-235000-1	2/28/2018	1.3 ºC
SWFTS-MW17-EM17	440-235000-2	2/28/2018	1.3 ºC
SWFTS-MW13-EM17	440-235000-3	2/28/2018	1.3 ºC
SWFTS-MW12-EM17	440-235000-4	2/28/2018	1.3 ºC
SWFTS-MW08A-EM17	440-235000-5	2/28/2018	1.3 ºC
SWFTS-MW06B-EM17	440-235000-6	2/28/2018	1.3 ºC
PC-97-EM17	440-235000-7	2/28/2018	1.3 ºC
PC-88-EM17	440-235000-8	2/28/2018	1.3 ºC
PC-88-EM17-FD	440-235000-9	2/28/2018	1.3 ºC
SWFTS-MW07A-EM17	440-235000-10	2/28/2018	1.3 ºC
SWFTS-MW07B-EM17	440-235000-11	2/28/2018	1.3 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Nitrate recoveries were low in the MS/MSD of SWFTS-MW09B-EM17. Sulfate recoveries were outside lab limits in the MS of SWFTS-MW09B-EM17, the MS/MSD of PC-88-EM17, and the MSD of SWFTS-MW17-EM17. Sulfate concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW07A-EM17. Chlorate concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 03/22/19

Data Verification and Validation Summary

Project Name: SWF Area Treatability Study
SDG/Report No.: 440-238531-1
Task No.: M11
Lab ID: Test America
No. of Samples: 5
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	PC-58-EM17, SWFTS-MW11-EM17, SWFTS-MW11-EM17-FD, and SWFTS-MW04-EM17: Qualify perchlorate "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	PC-58-EM17 and SWFTS-MW04-EM17: Qualify unused results "R".
Multiple results: PC-58-EM17 and SWFTS-MW04-EM17 were analyzed twice for sulfate. The initial 2x dilution analysis results exceeded the calibration range. The 100x results were within the calibration range and were selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. Qualified results (J, J+) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-20190301-FB	440-235133-1	3/1/2019	1.0 ºC
PC-58-EM17	440-235133-2	3/1/2019	1.0 ºC
SWFTS-MW11-EM17	440-235133-3	3/1/2019	1.0 ºC
SWFTS-MW11-EM17-FD	440-235133-4	3/1/2019	1.0 ºC
SWFTS-MW04-EM17	440-235133-5	3/1/2019	1.0 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
314.0: Perchlorate was detected in SWFTS-20190301-FB. FB value was adjusted for dilution to assess contamination. All results were <10x the amount in the adjusted FB.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recovery was high in the MSD of SWFTS-MW04-EM17. Sulfate recoveries were low in the MS/MS of PC-58-EM17. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW11-EM17. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 03/22/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 12 with MS/MSD

SDG/Report No.: 440-238531-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW03-EM18, SWFTS-MW05A-EM18, and SWFTS-MW09A-EM18: Qualify unused results "R".

Multiple results: SWFTS-MW03-EM18 and SWFTS-MW09A-EM18 were analyzed twice for sulfate. The initial 10x dilution analysis results exceeded the calibration range. The 500x results were within the calibration range and were selected.
SWFTS-MW05A-EM18 was analyzed twice for nitrate at 10x and 500x dilutions. The 10x analysis result was used because it was detected. The result obtained from the 500x dilution was not detected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Qualified results (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW01-EM18	440-238531-1	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-20190410-FB	440-238531-2	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW09A-EM18	440-238531-3	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-20190410-EB	440-238531-4	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW09B-EM18	440-238531-5	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW24-EM18	440-238531-6	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW03-EM18	440-238531-7	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW21-EM18	440-238531-8	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW05A-EM18	440-238531-9	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW05A-EM18-MS	440-238531-9 MS	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW05A-EM18-MSD	440-238531-9 MSD	4/10/2019	1.9 ºC/2.9 ºC
SWFTS-MW05B-EM18	440-238531-10	4/10/2019	1.9 ºC/2.9 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recovery was high in the MSD of SWFTS-MW09A-EM18. Sulfate recoveries were high in the MS/MS of SWFTS-MW03-EM18. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW09A-EM18. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 04/24/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 10 with MS/MSD

SDG/Report No.: 440-238544-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW06B-EM18, SWFTS-MW10A-EM18, and SWFTS-MW19-EM18-FD: Qualify unused results "R".

Multiple results: SWFTS-MW06B-EM18 and SWFTS-MW19-EM18-FD were analyzed twice for sulfate. The initial 5x dilution analysis results exceeded the calibration range. The 100x/200x results were within the calibration range and were selected.
SWFTS-MW10A-EM18 was analyzed twice for nitrate at 10x and 500x dilutions. The 10x analysis result was used because it was detected. The result obtained from the 500x dilution was not detected and was not used.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Qualified results (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW10A-EM18	440-238544-1	4/10/2019	2.9 ºC
SWFTS-MW10A-EM18-MS	440-238544-1 MS	4/10/2019	2.9 ºC
SWFTS-MW10A-EM18-MSD	440-238544-1 MSD	4/10/2019	2.9 ºC
SWFTS-MW06A-EM18	440-238544-2	4/10/2019	2.9 ºC
SWFTS-MW06A-EM18-FD	440-238544-3	4/10/2019	2.9 ºC
SWFTS-MW06B-EM18	440-238544-4	4/10/2019	2.9 ºC
SWFTS-MW19-EM18	440-238544-5	4/10/2019	2.9 ºC
PC-91-EM18	440-238544-6	4/10/2019	2.9 ºC
PC-92-EM18	440-238544-7	4/10/2019	2.9 ºC
SWFTS-MW19-EM18-FD	440-238544-8	4/10/2019	2.9 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	No/Yes
SWFTS-MW19-EM18-FD was not listed on the COC. The lab contacted the client and was instructed to run the sample.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were low in the MSD of SWFTS-MW06B-EM18 and the MS/MSD of SWFTS-MW19-EM18-FD. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recovery was high in the MSD of SWFTS-MW10A-EM18. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 04/24/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 13

SDG/Report No.: 440-238618-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	All: Qualify all nitrate "J", "J-" or "UJ"
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate		X	No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Qualified results (J, J-, UJ) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-20190409-FB	440-238618-1	4/9/2019	3.2 ºC/3.4 ºC
SWFTS-MW04-EM18	440-238618-2	4/9/2019	3.2 ºC/3.4 ºC
SWFTS-MW02-EM18	440-238618-3	4/9/2019	3.2 ºC/3.4 ºC
SWFTS-MW14-EM18	440-238618-4	4/9/2019	3.2 ºC/3.4 ºC
SWFTS-MW20-EM18	440-238618-5	4/9/2019	3.2 ºC/3.4 ºC
COH-2B1-EM18	440-238618-6	4/9/2019	3.2 ºC/3.4 ºC
PC-88-EM18	440-238618-7	4/9/2019	3.2 ºC/3.4 ºC
PC-88-EM18-FD	440-238618-8	4/9/2019	3.2 ºC/3.4 ºC
PC-97-EM18	440-238618-9	4/9/2019	3.2 ºC/3.4 ºC
PC-58-EM18	440-238618-10	4/9/2019	3.2 ºC/3.4 ºC
SWFTS-MW15-EM18	440-238618-11	4/9/2019	3.2 ºC/3.4 ºC
SWFTS-MW16-EM18	440-238618-12	4/9/2019	3.2 ºC/3.4 ºC
SWFTS-MW18-EM18	440-238618-13	4/9/2019	3.2 ºC/3.4 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
300.0: All nitrate analyses were performed past 48 hours.	

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
Outliers were in other data packages.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 04/25/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 6

SDG/Report No.: 440-238688-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW22-EM18: Qualify unused result "R".
Multiple results: SWFTS-MW22-EM18 was analyzed twice for sulfate. The initial 10x dilution analysis result exceeded the calibration range. The 200x result was within the calibration range and was selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-20190411-EB	440-238688-1	4/11/2019	4.9 ºC
SWFTS-MW22-EM18	440-238688-2	4/11/2019	4.9 ºC
SWFTS-MW23-EM18	440-238688-3	4/11/2019	4.9 ºC
SWFTS-MW25-EM18	440-238688-4	4/11/2019	4.9 ºC
SWFTS-MW17-EM18	440-238688-5	4/11/2019	4.9 ºC
PC-94-EM18	440-238688-6	4/11/2019	4.9 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recovery was high in the MSD of SWFTS-MW22-EM18. The concentration in the parent sample was >4x the amount spiked	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 04/29/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7

SDG/Report No.: 440-238733-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate		X	No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			

Overall Assessment: Acceptable as qualified.
Usability: Sample results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW08A-EM18	440-238733-1	4/12/2018	2.5 ºC
SWFTS-MW12-EM18	440-238733-2	4/12/2018	2.5 ºC
SWFTS-MW13-EM18	440-238733-3	4/12/2018	2.5 ºC
SWFTS-MW07B-EM18	440-238733-4	4/12/2018	2.5 ºC
SWFTS-MW07A-EM18	440-238733-5	4/12/2018	2.5 ºC
SWFTS-MW11-EM18	440-238733-6	4/12/2018	2.5 ºC
SWFTS-MW11-EM18-FD	440-238733-7	4/12/2018	2.5 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	No/Yes
The COC listed sample SWFTS-MW18-EM18. The correct sample ID was SWFTS-MW08A-EM18.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/N/A

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 04/29/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 3

SDG/Report No.: 440-242014-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	SWFTS-20190520-FB: Qualify dissolved magnesium and sodium "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW16-EM19: Qualify perchlorate "UJ".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Qualified results (J, J+, UJ) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW15-EM19	440-242014-1	5/20/2019	2.7 ºC
SWFTS-20190520-FB	440-242014-2	5/20/2019	2.7 ºC
SWFTS-MW16-EM19	440-242014-3	5/20/2019	2.7 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Calcium, magnesium, silicon, and sodium were detected in field blank SWFTS-20190520-FB. Concentrations in the samples were >10x the amount in the blank. Sodium was detected in method blank MB 440-548947/1-A at 0.364 mg/L. According to the case narrative, magnesium was detected in calibration blanks. Dissolved magnesium and sodium results in the FB will be qualified.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
314: Perchlorate recoveries were low in the MS/MSD of SWFTS-MW16-EM19.	
6010B: Calcium, magnesium, potassium, silicon, sodium, and strontium recoveries were low in the MS/MSD of SWFTS-MW15-EM19. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 06/19/19

Data Verification and Validation Summary

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 2
SDG/Report No.: 440-242015-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate		X	No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable.
Usability: Sample results qualified "J" (estimated) are useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW06A-EM19	440-242015-1	5/20/2019	2.7 °C
SWFTS-MW06A-EM19-FD	440-242015-2	5/20/2019	2.7 °C

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 °C? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Calcium, magnesium, silicon, and sodium were detected in field blank SWFTS-20190520-FB in SDG 440-242014-1. Sodium was detected in method blank MB 440-548947/1-A at 0.364 mg/L. According to the case narrative, magnesium was detected in calibration blanks. Concentrations in the samples were >10x the amount in the blanks.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
Outliers are from a different work order. No qualification this work order.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
All: Results detected above the MDL/SQL but below the RL/PQL are estimated and qualified "J".	

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 06/19/19

Data Verification and Validation Summary

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 22 with MS/MSDs
SDG/Report No.: 440-242084-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	PC-91-EM19, PC-92-EM19, SWFTS-MW01-EM19, SWFTS-MW05A-EM19, SWFTS-MW10A-EM19 SWFTS-MW22-EM19 : Qualify unused results "R".

Multiple results: PC-92-EM19, SWFTS-MW01-EM19, and SWFTS-MW22-EM19 were analyzed twice for sulfate. The initial analyses results exceeded the calibration range. The dilution results were within the calibration range and were selected.
PC-91-EM19 was analyzed twice for perchlorate. The initial 1x analysis result exceeded the calibration range. The 10x result was within the calibration range and was selected.
The following samples were analyzed twice for nitrate: SWFTS-MW05A-EM19 (10x and 500x) and SWFTS-MW10A-EM19 (10x and 200x). The initial analyses results were detected within the calibration range and chosen for reporting. The higher dilution results were used for lab QC.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used for reporting. Results qualified "J" are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW14-EM19	440-242084-1	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW10A-EM19	440-242084-2	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW10A-EM19-MS	440-242084-2 MS	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW10A-EM19-MSD	440-242084-2 MSD	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW20-EM19	440-242084-3	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW22-EM19	440-242084-4	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW06B-EM19	440-242084-5	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW19-EM19	440-242084-6	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW19-EM19-FD	440-242084-7	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW02-EM19	440-242084-8	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
PC-91-EM19	440-242084-9	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
PC-92-EM19	440-242084-10	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW04-EM19	440-242084-11	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW03-EM19	440-242084-12	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-20190521-FB	440-242084-13	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW01-EM19	440-242084-14	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW18-EM19	440-242084-15	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-20190521-EB	440-242084-16	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW05A-EM19	440-242084-17	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW05A-EM19-MS	440-242084-17 MS	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW05A-EM19-MSD	440-242084-17 MSD	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC
SWFTS-MW05B-EM19	440-242084-18	5/21/2019	2.2 ºC/2.4 ºC/3.1 ºC

Data Verification and Validation Summary

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 °C? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Boron and magnesium were detected in SWFTS-20190521-EB. Calcium, magnesium, silicon, and sodium were detected in SWFTS-20190521-FB. According to the case narrative, molybdenum and magnesium were detected in several calibration blanks. They were reviewed. For all these cases, concentrations in the associated samples were >10x the amount in the blanks or ND, so no qualification is needed.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were low in the MS/MSD of PC-92-EM19. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were high in the MS/MSD of SWFTS-MW22-EM19. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
6010B: Calcium, magnesium, silicon, sodium, and strontium recoveries were outside limits in the MS and/or MSD of SWFTS-MW10A-EM19 and SWFTS-MW05A-EM19. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 06/20/19

Data Verification and Validation Summary

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7
SDG/Report No.: 440-242198-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW24-EM19: Qualify unused results "R".

Multiple results: SWFTS-MW24-EM19 was analyzed twice for sulfate. The initial 10x analysis result exceeded the calibration range. The 500x result was within the calibration range and was selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Sample results qualified "J" (estimated) are useable for limited purposes. All other results are considered valid and useable for all purposes.

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW24-EM19	440-242198-1	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-20190522-EB	440-242198-2	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW21-EM19	440-242198-3	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW08A-EM19	440-242198-4	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW13-EM19	440-242198-5	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW17-EM19	440-242198-6	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW12-EM19	440-242198-7	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Calcium, magnesium, silicon, and sodium were detected in SWFTS-20190522-EB. According to the case narrative, potassium and sodium were detected in calibration blanks. They were reviewed. For all these cases, concentrations in the associated samples were >10x the amount in the blanks or ND, so no qualification is needed.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
6010B: Calcium, magnesium, and sodium recoveries were outside limits in the MS and/or MSD of SWFTS-MW24-EM19. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	
6020: Arsenic, selenium, and thallium recoveries were low in the MSD of SWFTS-MW24-EM19. Antimony RPD was high. MS recoveries were within limits. It appears to be a spiking error and not matrix. No qualification.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 06/20/19

Data Verification and Validation Summary

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7
SDG/Report No.: 440-242200-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	X		Yes	SWFTS-MW11-EM19 and SWFTS-MW11-EM19-FD: Qualify total manganese "J" or "UJ".
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW09A-EM19 and SWFTS-MW11-EM19-FD: Qualify unused results "R".
Multiple results: SWFTS-MW09A-EM19 and SWFTS-MW11-EM19-FD were analyzed twice for sulfate. The initial 10x analyses results exceeded the calibration range. The 500x results were within the calibration range and were selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable. **Usability:** Sample results qualified "R" should not be used. Sample results qualified "J" or "UJ (estimated) are useable for limited purposes. All other results are considered valid and useable for all purposes.				

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW09A-EM19	440-242200-1	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW09B-EM19	440-242200-2	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW11-EM19	440-242200-3	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW11-EM19-FD	440-242200-4	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW07A-EM19	440-242200-5	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW07B-EM19	440-242200-6	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
PC-58-EM19	440-242200-7	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: According to the case narrative, potassium and sodium were detected in calibration blanks. They were reviewed. The concentrations in the associated samples were >10x the amount in the blanks or ND, so no qualification is needed.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MS/MSDs of SWFTS-MW09A-EM19 and SWFTS-MW11-EM19-FD. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/No
SWFTS-MW11-EM19 and SWFTS-MW11-EM19-FD: The difference between the total manganese results was greater than the PQL.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 06/20/19

Data Verification and Validation Summary

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7
SDG/Report No.: 440-242201-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Other – Serial Dilution	X		Yes	PC-88-EM19 and PC-88-EM19-FD: Qualify total manganese "J". SWFTS-MW23-EM19: Qualify silicon "J".
12. Multiple Results (see below)	---	---	Yes	PC-97-EM19: Qualify unused results "R".

Multiple results: PC-97-EM19 was analyzed twice for sulfate. The initial 2x analyses results exceeded the calibration range. The 100x results were within the calibration range and was selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable.
Usability: Sample results qualified "R" should not be used. Sample results qualified "J" (estimated) are useable for limited purposes. All other results are considered valid and useable for all purposes.

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
PC-97-EM19	440-242201-1	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
PC-88-EM19	440-242201-2	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
PC-88-EM19-FD	440-242201-3	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
PC-94-EM19	440-242201-4	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
COH-2B1-EM19	440-242201-5	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW25-EM19	440-242201-6	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC
SWFTS-MW23-EM19	440-242201-7	5/22/2019	1.6 ºC/2.4 ºC/2.6 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Sodium was detected in MB 440-550740/1-A. According to the case narrative, potassium and sodium were detected in calibration blanks. They were reviewed. In all cases, the concentrations in the associated samples were >10x the amount in the blanks or ND, so no qualification is needed.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recovery was high in the MSD of PC-97-EM19. The concentrations in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
6010B: Calcium, magnesium, silicon, and sodium recoveries were outside limits in the MS and/or MSD of SWFTS-MW23-EM19. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes
PC-88-EM19 and PC-88-EM19-FD	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

11. Other – Serial Dilution
Serial Dilution %D for manganese in PC-88-EM19-FD was 12%. The limit is 10% Serial Dilution %D for silicon in SWFTS-MW23-EM19 was 11%. The limit is 10%

Validated by: Maureen McMyler 06/20/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 8 with MS/MSD

SDG/Report No.: 440-245046-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW06A-EM20 and SWFTS-MW06A-EM20-FD: Qualify chlorate "J".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW06B-EM20 and SWFTS-MW10A-EM20: Qualify unused results "R".

Multiple results: SWFTS-MW06B-EM20 was analyzed twice for sulfate. The initial 2x analysis result exceeded the calibration range. The 100x result was within the calibration range and was selected.
SWFTS-MW10A-EM20 was analyzed twice for nitrate. Nitrate was not detected in the 200x analysis result. The 10x result was detected and was selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Results qualified as estimated (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
PC-91-EM20	440-245046-1	7/1/2019	1.4 ºC
PC-92-EM20	440-245046-2	7/1/2019	1.4 ºC
SWFTS-MW10A-EM20	440-245046-3	7/1/2019	1.4 ºC
SWFTS-MW10A-EM20-MS	440-245046-3 MS	7/1/2019	1.4 ºC
SWFTS-MW10A-EM20-MSD	440-245046-3 MSD	7/1/2019	1.4 ºC
SWFTS-MW06B-EM20	440-245046-4	7/1/2019	1.4 ºC
SWFTS-MW06A-EM20	440-245046-5	7/1/2019	1.4 ºC
SWFTS-MW06A-EM20-FD	440-245046-6	7/1/2019	1.4 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MS/MSD of SWFTS-MW06B-EM20. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW06A-EM20. Chlorate recoveries were within limits in the MS/MSD of SWFTS-MW06A-EM20-FD. The parent concentration is greater than the FD concentration even though the MS/MSD recoveries are low. Using professional judgment, qualified SWFTS-MW06A-EM20 and SWFTS-MW06A-EM20-FD "J" because of conflicting results.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 07/23/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 13 with MS/MSD

SDG/Report No.: 440-245068-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW05B-EM20, SWFTS-MW24-EM20, and SWFTS-MW10A-EM20: Qualify unused results "R".

Multiple results: SWFTS-MW05B-EM20 and SWFTS-MW24-EM20 were analyzed twice for sulfate. The initial 10x analysis result exceeded the calibration range. The 200x result was within the calibration range and was selected. SWFTS-MW10A-EM20 was analyzed twice for nitrate. Nitrate was not detected in the 500x analysis result. The 10x result was detected and was selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Results qualified as estimated (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW16-EM20	440-245068-1	7/1/2019	1.4 ºC
SWFTS-20190701-EB	440-245068-2	7/1/2019	1.4 ºC
SWFTS-MW18-EM20	440-245068-3	7/1/2019	1.4 ºC
COH-2B1-EM20	440-245068-4	7/1/2019	1.4 ºC
SWFTS-MW01-EM20	440-245068-5	7/1/2019	1.4 ºC
SWFTS-MW05A-EM20	440-245068-6	7/1/2019	1.4 ºC
SWFTS-MW05A-EM20-MS	440-245068-6 MS	7/1/2019	1.4 ºC
SWFTS-MW05A-EM20-MSD	440-245068-6 MSD	7/1/2019	1.4 ºC
SWFTS-MW05B-EM20	440-245068-7	7/1/2019	1.4 ºC
SWFTS-MW21-EM20	440-245068-8	7/1/2019	1.4 ºC
SWFTS-MW24-EM20	440-245068-9	7/1/2019	1.4 ºC
SWFTS-MW03-EM20	440-245068-10	7/1/2019	1.4 ºC
SWFTS-MW08A-EM20	440-245068-11	7/1/2019	1.4 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
314.0: Perchlorate was detected in equipment blank SWFTS-20190701-EB. Concentrations in the associated samples were >10x the amount in the EB. No qualification.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were outside limits in the MS samples of SWFTS-MW05B-EM20 and SWFTS-MW24-EM20. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 07/26/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 11

SDG/Report No.: 440-245153-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW19-EM20 and SWFTS-MW22-EM20: Qualify unused results "R".

Multiple results: SWFTS-MW19-EM20 and SWFTS-MW22-EM20 were analyzed twice for sulfate. The initial analyses results exceeded the calibration range. Results within the calibration range were selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Results qualified as estimated (J) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW19-EM20	440-245153-1	7/2/2019	5.2 ºC
SWFTS-MW19-EM20-FD	440-245153-2	7/2/2019	5.2 ºC
SWFTS-MW20-EM20	440-245153-3	7/2/2019	5.2 ºC
SWFTS-20190702-FB	440-245153-4	7/2/2019	5.2 ºC
SWFTS-MW22-EM20	440-245153-5	7/2/2019	5.2 ºC
SWFTS-20190702-EB	440-245153-6	7/2/2019	5.2 ºC
SWFTS-MW14-EM20	440-245153-7	7/2/2019	5.2 ºC
SWFTS-MW02-EM20	440-245153-8	7/2/2019	5.2 ºC
SWFTS-MW15-EM20	440-245153-9	7/2/2019	5.2 ºC
SWFTS-MW09A-EM20	440-245153-10	7/2/2019	5.2 ºC
SWFTS-MW09B-EM20	440-245153-11	7/2/2019	5.2 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were outside limits in the MS/MSD samples of SWFTS-MW22-EM20 and SWFTS-MW19-EM20. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSD of SWFTS-MW22-EM20. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 07/26/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 6

SDG/Report No.: 440-245218-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW11-EM20-FD and SWFTS-MW07A-EM20: Qualify unused results "R".
Multiple results: SWFTS-MW11-EM20-FD and SWFTS-MW07A-EM20 were analyzed twice for sulfate. The initial 10x analysis results exceeded the calibration range. The 200x results were within the calibration range and selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW25-EM20	440-245218-1	7/3/2019	4.2 °C
SWFTS-MW23-EM20	440-245218-2	7/3/2019	4.2 °C
SWFTS-MW11-EM20	440-245218-3	7/3/2019	4.2 °C
SWFTS-MW11-EM20-FD	440-245218-4	7/3/2019	4.2 °C
SWFTS-MW07B-EM20	440-245218-5	7/3/2019	4.2 °C
SWFTS-MW07A-EM20	440-245218-6	7/3/2019	4.2 °C

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 °C? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were outside limits in the MS/MSDs of SWFTS-MW07A-EM20 and SWFTS-MW20-EM20-FD. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 07/26/19

Data Verification and Validation Summary

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 5
SDG/Report No.: 440-245259-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW12-EM20: Qualify chlorate "J+".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW12A-EM20: Qualify unused result "R".
Multiple results: SWFTS-MW12-EM20 was analyzed twice for sulfate. The initial 5x analysis result exceeded the calibration range. The 200x result was within the calibration range and was selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. Sample results qualified "J+" (estimated) are useable for limited purposes. All other results are considered valid and useable for all purposes.				

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
PC-94-EM20	440-245259-1	7/5/2019	4.2 ºC
SWFTS-20190705-FB	440-245259-2	7/5/2019	4.2 ºC
SWFTS-MW17-EM20	440-245259-3	7/5/2019	4.2 ºC
SWFTS-MW12-EM20	440-245259-4	7/5/2019	4.2 ºC
SWFTS-MW13-EM20	440-245259-5	7/5/2019	4.2 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Nitrate and sulfate recoveries were outside limits in the MS/MSD of SWFTS-MW12-EM20. The sulfate concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 07/26/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 5

SDG/Report No.: 440-245261-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	PC-97-EM20 and PC-58-EM20: Qualify unused results "R".
Multiple results: PC-97-EM20 and PC-58-EM20 were analyzed twice for sulfate. The initial 2x analysis results exceeded the calibration range. The 100x results were within the calibration range and were selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW04-EM20	440-245261-1	7/5/2019	4.2 ºC
PC-97-EM20	440-245261-2	7/5/2019	4.2 ºC
PC-88-EM20	440-245261-3	7/5/2019	4.2 ºC
PC-88-EM20-FD	440-245261-4	7/5/2019	4.2 ºC
PC-58-EM20	440-245261-5	7/5/2019	4.2 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Nitrate and sulfate recoveries were outside limits in the MS and/or MSD of PC-58-EM20. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recovery was high in the MS of SWFTS-MW04-EM20. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 07/26/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 11 with MS/MSD

SDG/Report No.: 440-247878-1/2
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	PC-91-EM21: Qualify perchlorate "J+".
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	Qualify all detections between the MDL/SQL and RL/PQL "J".
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW10A-EM21: Qualify unused result "R".
Multiple results: SWFTS-MW10A-EM21 was analyzed twice for nitrate. Nitrate was not detected in either run. The initial 10x analysis result had a lower PQL.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample result qualified "R" should not be used. Sample results qualified "J" or "J+" (estimated) are useable for limited purposes. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
PC-91-EM21	440-247878-1	8/12/2019	0.8 ºC
PC-92-EM21	440-247878-2	8/12/2019	0.8 ºC
SWFTS-MW10A-EM21	440-247878-3	8/12/2019	0.8 ºC
SWFTS-MW10A-EM21-MS	440-247878-3 MS	8/12/2019	0.8 ºC
SWFTS-MW10A-EM21-MSD	440-247878-3 MSD	8/12/2019	0.8 ºC
PC-94-EM21	440-247878-4	8/12/2019	0.8 ºC
SWFTS-MW22-EM21	440-247878-5	8/12/2019	0.8 ºC
SWFTS-MW01-EM21	440-247878-6	8/12/2019	0.8 ºC
SWFTS-MW09A-EM21	440-247878-7	8/12/2019	0.8 ºC
SWFTS-MW09B-EM21	440-247878-8	8/12/2019	0.8 ºC
SWFTS-20190812-FB	440-247878-9	8/12/2019	0.8 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Nitrate analyses were not requested on the COC. The lab was instructed by the client to perform nitrate analyses on all of the samples.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
314.0: Perchlorate recovery was high in the MSD of PC-91-EM21.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 08/26/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 11 with MS/MSD

SDG/Report No.: 440-247965-1/2
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate		X	No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify results between the SQL and PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW05A-EM21: Qualify unused result "R".

Multiple results: SWFTS-MW05A-EM21 was analyzed twice for nitrate. The initial 20x analysis result was detected within the calibration range. Nitrate was not detected in the 500x analysis.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample result qualified "R" should not be used. Sample result qualified "J" (estimated) is useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW20-EM21	440-247965-1	8/13/2019	0.8 ºC
SWFTS-MW21-EM21	440-247965-2	8/13/2019	0.8 ºC
SWFTS-MW18-EM21	440-247965-3	8/13/2019	0.8 ºC
SWFTS-MW16-EM21	440-247965-4	8/13/2019	0.8 ºC
SWFTS-MW15-EM21	440-247965-5	8/13/2019	0.8 ºC
SWFTS-MW14-EM21	440-247965-6	8/13/2019	0.8 ºC
SWFTS-MW05A-EM21	440-247965-7	8/13/2019	0.8 ºC
SWFTS-MW05A-EM21-MS	440-247965-7 MS	8/13/2019	0.8 ºC
SWFTS-MW05A-EM21-MSD	440-247965-7 MSD	8/13/2019	0.8 ºC
SWFTS-MW05B-EM21	440-247965-8	8/13/2019	0.8 ºC
SWFTS-20190813-EB	440-247965-9	8/13/2019	0.8 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/Yes

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 08/28/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 11

SDG/Report No.: 440-248104-1/2
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW06A-EM21-FD: Qualify unused result "R".
Multiple results: SWFTS-MW06A-EM21-FD was analyzed twice for sulfate. The initial 5x analysis result exceeded the calibration range. The 200x result was within the calibration range and was selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW24-EM21	440-248104-1	8/14/2019	2.2 ºC
SWFTS-MW03-EM21	440-248104-2	8/14/2019	2.2 ºC
SWFTS-MW02-EM21	440-248104-3	8/14/2019	2.2 ºC
SWFTS-MW25-EM21	440-248104-4	8/14/2019	2.2 ºC
SWFTS-20190814-FB	440-248104-5	8/14/2019	2.2 ºC
SWFTS-MW23-EM21	440-248104-6	8/14/2019	2.2 ºC
SWFTS-MW06A-EM21	440-248104-7	8/14/2019	2.2 ºC
SWFTS-MW06A-EM21-FD	440-248104-8	8/14/2019	2.2 ºC
SWFTS-MW06B-EM21	440-248104-9	8/14/2019	2.2 ºC
SWFTS-MW04-EM21	440-248104-10	8/14/2019	2.2 ºC
PC-97-EM21	440-248104-11	8/14/2019	2.2 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
There was no custody seal on the cooler. No evidence of tampering.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MS/MSD of SWFTS-MW06A-EM21-FD. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recovery was low in the MS/MSD of SWFTS-MW24-EM21. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 09/03/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 12

SDG/Report No.: 440-248187-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW07A-EM21 and COH-2B1-EM21: Qualify unused results "R".
Multiple results: SWFTS-MW07A-EM21 and COH-2B1-EM21 were analyzed twice for sulfate. The initial analysis results exceeded the calibration range. The higher dilution results were within the calibration range and were selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW07A-EM21	440-248187-1	8/15/2019	1.8 ºC
SWFTS-MW07B-EM21	440-248187-2	8/15/2019	1.8 ºC
SWFTS-MW11-EM21	440-248187-3	8/15/2019	1.8 ºC
SWFTS-MW11-EM21-FD	440-248187-4	8/15/2019	1.8 ºC
SWFTS-MW19-EM21	440-248187-5	8/15/2019	1.8 ºC
SWFTS-MW19-EM21-FD	440-248187-6	8/15/2019	1.8 ºC
COH-2B1-EM21	440-248187-7	8/15/2019	1.8 ºC
PC-58-EM21	440-248187-8	8/15/2019	1.8 ºC
PC-88-EM21	440-248187-9	8/15/2019	1.8 ºC
PC-88-EM21-FD	440-248187-10	8/15/2019	1.8 ºC
SWFTS-MW08A-EM21	440-248187-11	8/15/2019	1.8 ºC
SWFTS-20190815-EB	440-248187-12	8/15/2019	1.8 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MS/MSD of SWFTS-MW07A-EM21 and COH-2B1-EM21. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 09/03/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 3

SDG/Report No.: 440-248259-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW13-EM21: Qualify unused result "R".
Multiple results: SWFTS-MW13-EM21 was analyzed twice for sulfate. The initial 20x analysis result exceeded the calibration range. The 500x result was within the calibration range and was selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW17-EM21	440-248259-1	8/16/2019	3.9 ºC
SWFTS-MW12-EM21	440-248259-2	8/16/2019	3.9 ºC
SWFTS-MW13-EM21	440-248259-3	8/16/2019	3.9 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recovery was low in the MS of SWFTS-MW13-EM21. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSDs of SWFTS-MW17-EM21 and SWFTS-MW12-EM21. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 09/03/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 3

SDG/Report No.: 440-253773-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	COH-2B1-EM22, SWFTS-MW03-EM22, SWFTS-MW21-EM22: Qualify chromium "J" or "J+". COH-2B1-EM22: Qualify titanium "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	---	---	---	---
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	COH-2B1-EM22: Qualify unused result "R".

Multiple results: COH-2B1-EM22 was analyzed twice for sulfate. The initial 10x analysis result exceeded the calibration range. The 200x result was within the calibration range and was selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used. Qualified results (J, J+) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
COH-2B1-EM22	440-253773-1	11/4/2019	2.2 ºC
SWFTS-MW03-EM22	440-253773-2	11/4/2019	2.2 ºC
SWFTS-MW21-EM22	440-253773-3	11/4/2019	2.2 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Chromium and titanium were detected in MB 440-578658/1-A. Molybdenum and titanium were detected in at least one bracketing calibration blank. Molybdenum concentrations in the samples were > 10x the amount in the blanks.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.1B: Chlorate recoveries were low in the MS/MSDs of COH-2B1-EM22 and SWFTS-MW03-EM22. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 11/26/2019

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7

SDG/Report No.: 440-253891-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	All: Qualify chromium "J+". SWFTS-MW22-EM22: Qualify titanium "J+". SWFTS-MW23-EM22, SWFTS-MW19-EM22, and SWFTS-MW19-EM22-FD: Qualify molybdenum "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	X		Yes	SWFTS-MW19-EM22 and SWFTS-MW19-EM22-FD: Qualify zinc “UJ” or “J”.
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL “J”.
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW09A-EM22 and SWFTS-MW19-EM22-FD: Qualify unused results “R”.

Multiple results: The following samples were analyzed twice for sulfate: SWFTS-MW09A-EM22 (10x and 500x) and SWFTS-MW19-EM22-FD (5x and 200x). The initial results exceeded the calibration range. The reanalysis results at higher dilutions were within the calibration range and were selected for reporting.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified “R” should not be used. Qualified results (UJ, J, J+) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW09A-EM22	440-253891-1	11/5/2019	3.0 ºC
SWFTS-MW24-EM22	440-253891-2	11/5/2019	3.0 ºC
SWFTS-MW09B-EM22	440-253891-3	11/5/2019	3.0 ºC
SWFTS-MW22-EM22	440-253891-4	11/5/2019	3.0 ºC
SWFTS-MW23-EM22	440-253891-5	11/5/2019	3.0 ºC
SWFTS-MW19-EM22	440-253891-6	11/5/2019	3.0 ºC
SWFTS-MW19-EM22-FD	440-253891-7	11/5/2019	3.0 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Chromium and titanium were detected in MB 440-578658/1-A. Magnesium, molybdenum, and titanium were detected in at least one bracketing calibration blank. Magnesium concentrations in the samples were >10x the amount in the blank. Molybdenum concentrations in the samples were >10x the amount in the blank for three samples and < 10x the amount in the blank for three samples.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MS/MSDs of SWFTS-MW09A-EM22 and SWFTS-MW19-EM22-FD . The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were high in the MS/MSD of SWFTS-MW09A-EM22. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
6010B: Recoveries for several metals were outside limits in the MS/MSD of SWFTS-MW09A-EM22. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/No
SWFTS-MW19-EM22 and SWFTS-MW19-EM22-FD. For zinc, parent is ND, FD >5x RL. Difference > RL.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 12/02/2019

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 9 (including MS/MSD)

SDG/Report No.: 440-253918-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	All: Qualify chromium “J” or "J+". SWFTS-MW05A-EM22: Qualify antimony "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW05A-EM22: Qualify perchlorate “J+”.
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL “J”.
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW05A-EM22: Qualify unused result “R”.

Multiple results: The following sample was analyzed twice for nitrate: SWFTS-MW05A-EM22 (20x and 500X). The initial result was used. The 500x dilution was ND and used for QC.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified “R” should not be used for reporting. Qualified results (J, J+) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW05A-EM22	440-253918-1	11/5/2019	3.0 ºC
SWFTS-MW05A-EM22-MS	440-253918-1 MS	11/5/2019	3.0 ºC
SWFTS-MW05A-EM22-MSD	440-253918-1 MSD	11/5/2019	3.0 ºC
SWFTS-MW05B-EM22	440-253918-2	11/5/2019	3.0 ºC
SWFTS-MW01-EM22	440-253918-3	11/5/2019	3.0 ºC
SWFTS-MW25-EM22	440-253918-4	11/5/2019	3.0 ºC
SWFTS-20191105-FB	440-253918-5	11/5/2019	3.0 ºC
SWFTS-MW20-EM22	440-253918-6	11/5/2019	3.0 ºC
SWFTS-20191105-EB	440-253918-7	11/5/2019	3.0 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	No/Yes
SWFTS-20191105-EB was listed as SWFTS-2019110F-EB on the COC. Client instructed the lab to change the ID.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Chromium was detected in MB 440-578831/1-A. Magnesium and titanium were detected in CCB 440-579095/20 associated with the MB and LCS only. Molybdenum and titanium were detected in CCB 440-579095/43 associated with the EB, which was non-detect. Calcium, chromium, magnesium, and sodium were detected in SWFTS-20191105-EB and SWFTS-20191105-FB. Calcium, magnesium, and sodium concentrations in the field samples were >10x the amount in the blanks.	
6020A: Antimony was detected in CCB 440-579073/15 and CCB 440-579073/27. It was detected in one sample.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
314.0: Perchlorate recovery was high in the MS of SWFTS-MW05A-EM22.	
6010B: Recoveries for several metals were outside limits in the MS and/or MSD of SWFTS-MW05A-EM22. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/N/A/Yes
Lab duplicate.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 12/17/2019

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 7

SDG/Report No.: 440-254027-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	PC-92-EM22, PC-94-EM22, PC-97-EM22, SWFTS-MW06A-EM22-FD, SWFTS-MW06B-EM22: Qualify chromium "J". SWFTS-MW06A-EM22: Qualify chromium "J+". PC-92-EM22, PC-97-EM22, SWFTS-MW06A-EM22, SWFTS-MW06A-EM22-FD, and SWFTS-MW06B-EM22: Qualify molybdenum "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates	X		Yes	SWFTS-MW06A-EM22 and SWFTS-MW06A-EM22: Qualify silicon “J”.
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL “J”.
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	---	---

Multiple results: N/A

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Qualified results (J, J+) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
PC-94-EM22	440-254027-1	11/6/2019	1.3 ºC/3.5 ºC
PC-92-EM22	440-254027-2	11/6/2019	1.3 ºC/3.5 ºC
PC-91-EM22	440-254027-3	11/6/2019	1.3 ºC/3.5 ºC
SWFTS-MW06A-EM22	440-254027-4	11/6/2019	1.3 ºC/3.5 ºC
SWFTS-MW06A-EM22-FD	440-254027-5	11/6/2019	1.3 ºC/3.5 ºC
SWFTS-MW06B-EM22	440-254027-6	11/6/2019	1.3 ºC/3.5 ºC
PC-97-EM22	440-254027-7	11/6/2019	1.3 ºC/3.5 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Chromium was detected in MB 440-578831/1-A. Most results were qualified. Zinc was detected in MB 440-580870/1-A. Titanium was detected in CCB 440-579610/20 and CCB 440-580793/22. Magnesium and titanium were detected in CCB 440-579095/20 and CCB 440-581112/39. Molybdenum and titanium were detected in CCB 440-579095/43. Calcium, chromium, magnesium, and sodium were detected in SWFTS-20191105-EB and SWFTS-20191105-FB in SDG 440-253918-1. Most of the metals were not detected in the associated samples or were detected at concentrations >10x the amount in the blanks.	
6020A: Antimony was detected in CCB 440-579073/15 and CCB 440-579073/27. It was not detected in bracketed samples.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
6010B: Recoveries for several metals were outside limits in the MS and/or MSD of PC-91-EM22. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/No/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 12/18/2019

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 8 with MS/MSD

SDG/Report No.: 440-254051-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	SWFTS-MW10A-EM22: Qualify chromium "J". SWFTS-MW13-EM22, SWFTS-MW14-EM22, SWFTS-MW15-EM22, SWFTS-MW16-EM22, and SWFTS-MW18-EM22: Qualify chromium "J+". SWFTS-MW10A-EM22 and SWFTS-MW15-EM22: Qualify molybdenum "J+". SWFTS-MW14-EM22: Qualify molybdenum "J".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW10A-EM22: Qualify TOC "J-".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Other (Serial Dilution)	X		Yes	SWFTS-MW10A-EM22: Qualify boron "J".
12. Multiple Results (see below)	---	---	Yes	SWFTS-MW10A-EM22: Qualify unused result "R".

Multiple results: The following sample was analyzed twice for nitrate: SWFTS-MW10A-EM22 (10x and 500X). The initial result was used. The 500x dilution was not detected and used for lab QC.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used for reporting. Qualified results (J-, J, J+) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW10A-EM22	440-254051-1	11/6/2019	3.5 ºC/4.6 ºC
SWFTS-MW10A-EM22-MS	440-254051-1 MS	11/6/2019	3.5 ºC/4.6 ºC
SWFTS-MW10A-EM22-MSD	440-254051-1 MSD	11/6/2019	3.5 ºC/4.6 ºC
SWFTS-MW14-EM22	440-254051-2	11/6/2019	3.5 ºC/4.6 ºC
SWFTS-MW15-EM22	440-254051-3	11/6/2019	3.5 ºC/4.6 ºC
SWFTS-MW18-EM22	440-254051-4	11/6/2019	3.5 ºC/4.6 ºC
SWFTS-MW16-EM22	440-254051-5	11/6/2019	3.5 ºC/4.6 ºC
SWFTS-MW13-EM22	440-254051-6	11/6/2019	3.5 ºC/4.6 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Sampler did not sign COC.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Chromium was detected in MB 440-579100/1-A. Detected results were qualified. Per the case narrative, several metals were detected in CCBs. Only those affecting sample results are listed below. Molybdenum was detected in CCB 440-579507/24 and CCB 440-579507/37. Calcium, chromium, magnesium, and sodium were detected in SWFTS-20191105-EB and SWFTS-20191105-FB in SDG 440-253918-1. Calcium, magnesium, and sodium concentrations in the samples were >10x the amount in the blanks.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.1B: Recoveries for chlorate were high in the MS/MSD of SWFTS-MW13-EM22. The concentration in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
6010B: Recoveries for several metals were outside limits in the MS and/or MSD of SWFTS-MW10A-EM22. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	
SM5310: Recovery for TOC was low in the MS of SWFTS-MW10A-EM22.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/N/A
Lab duplicate.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

11. Other (Serial Dilution)
6010B: SWFTS-MW10A-EM22: Percent difference in serial dilution of boron was 59%. Ten percent is allowed.

Validated by: Maureen McMyler 12/27/2019

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 8

SDG/Report No.: 440-254148-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody	X		No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	PC-58-EM22, PC-88-EM22, SWFTS-MW07A-EM22, SWFTS-MW07B-EM22, SWFTS-MW08A-EM22: Qualify chromium "J+". PC-88-EM22-FD, SWFTS-MW02-EM22, and SWFTS-20191107-EB: Qualify chromium "J". PC-58-EM22, PC-88-EM22, PC-88-EM22-FD, SWFTS-MW02-EM22, SWFTS-MW07A-EM22, SWFTS-MW07B-EM22, and SWFTS-MW08A-EM22: Qualify molybdenum "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW02-EM22, SWFTS-MW07A-EM22: Qualify unused results "R".

Multiple results: The following samples were analyzed twice for sulfate: SWFTS-MW02-EM22 (20x and 500x) and SWFTS-MW07A-EM22 (10x and 500x). The initial results exceeded the calibration range. The 500x dilution results were used because they were within the calibration range. SWFTS-MW02-EM22 was analyzed twice for nitrate. It was not detected. The 20x dilution was used for the lower PQL. The 500x was used for lab QC.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used for reporting. Qualified results (J, J+) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
PC-58-EM22	440-254148-1	11/7/2019	4.1 ºC
PC-88-EM22	440-254148-2	11/7/2019	4.1 ºC
PC-88-EM22-FD	440-254148-3	11/7/2019	4.1 ºC
SWFTS-MW07A-EM22	440-254148-4	11/7/2019	4.1 ºC
SWFTS-MW07B-EM22	440-254148-5	11/7/2019	4.1 ºC
SWFTS-MW08A-EM22	440-254148-6	11/7/2019	4.1 ºC
SWFTS-MW02-EM22	440-254148-7	11/7/2019	4.1 ºC
SWFTS-20191107-EB	440-254148-8	11/7/2019	4.1 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Sampler did not sign COC. There were no custody seals on the cooler, but there was no evidence of tampering.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Chromium and sodium were detected in MB 440-579115/1-A. Chromium was detected in MB 440-579100/1-A. Chromium results were qualified in all samples. Per the case narrative, several metals were detected in CCBs. Only those affecting sample results are listed below. Molybdenum was detected in CCB 440-579375/26 and CCB 440-579375/36. Molybdenum was detected in CCB 440-579507/37 and CCB2 440-579507/50. Calcium, chromium, and magnesium were detected in SWFTS-20191107-EB. Calcium and magnesium concentrations in the samples were >10x the amount in the EB. Calcium, magnesium, silicon, and sodium were detected in SWFTS-20191107-FB in SDG 440-254150-1. The concentrations in the samples were >10x the amount in the FB.	
RSK-175: Methane was detected in SWFTS-20191107-EB. Most samples were non-detect. Detection was >10x the amount in the blank.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Recoveries for sulfate were high in the MSD of SWFTS-MW07A-EM22 and MS/MSD of SWFTS-MW02-EM22. The concentrations in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Recoveries for chlorate were outside limits in the MS/MSD of PC-58-EM22 and PC-88-EM22. The concentrations in the parent sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 12/27/2019

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 6

SDG/Report No.: 440-254150-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	SWFTS-MW12-EM22: Qualify methane “J”.
2. Chain-of-Custody	X		No	None
3. Holding Times	X		Yes	SWFTS-MW12-EM22: Qualify methane “J”.
4. Blanks	X		Yes	SWFTS-MW17-EM22, SWFTS-MW11-EM22, SWFTS-MW11-EM22-FD: Qualify chromium "J+". SWFTS-20191107-FB: Qualify sodium "J+".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate		X	No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL “J”.
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW17-EM22: Qualify unused results “R”.
Multiple results: The following samples were analyzed twice for sulfate SWFTS-MW17-EM22 (10x and 500x). The initial result exceeded the calibration range. The 500x dilution result was used because it was within the calibration range.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified “R” should not be used for reporting. Qualified results (J, J+) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW17-EM22	440-254150-1	11/7/2019	4.3 ºC
SWFTS-MW12-EM22	440-254150-2	11/7/2019	4.3 ºC
SWFTS-MW11-EM22	440-254150-3	11/7/2019	4.3 ºC
SWFTS-MW11-EM22-FD	440-254150-4	11/7/2019	4.3 ºC
SWFTS-20191107-FB	440-254150-5	11/7/2019	4.3 ºC
SWFTS-MW04-EM22	440-254150-6	11/7/2019	4.3 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 °C? Were samples received in proper condition?	No/Yes/Yes
RSK-175: SWFTS-MW12-EM22 was not preserved to pH <2. The container contained the appropriate preservative.	
6010B: SWFTS-MW12-EM22 was not preserved to pH <2. The lab adjusted the pH with additional nitric acid the day after sampling. No qualification.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
Sampler did not sign COC. Cooler custody seals were not present, but there was no evidence of tampering.	

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
RSK-175: SWFTS-MW12-EM22 was not preserved to pH <2. When discovered, it was past the holding time for unpreserved samples.	

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Chromium was detected in MB 440-579100/1-A. Chromium detections were qualified in the samples. Iron was detected in MB 440-580432/1-A, but not in the associated samples. Per the case narrative, several metals were detected in CCBs. Only those affecting sample results are listed below. Molybdenum, sodium, and titanium were detected in CCB 440-579507/37. Sodium was detected in the FB. Beryllium, molybdenum, sodium, and titanium were detected in CCB2 440-579507/50. Analytes were ND or >10x the amount in the blank.	
RSK-175: Methane was detected in SWFTS-20191107-EB in SDG 440-254148-1. Samples were non-detect.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/Yes

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/10/2020

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 2

SDG/Report No.: 440-255698-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport	X		Yes	SWFTS-MW12-EM22-R and SWFTS-MW12-EM22-R-FD: Qualify metals "UJ","J", or" J-"; qualify methane "J"; qualify TOC "J-".
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	SWFTS-MW12-EM22-R and SWFTS-MW12-EM22-R-FD: Qualify methane "J" and TOC "J-".
4. Blanks	X		Yes	SWFTS-MW12-EM22-R-FD: Qualify zinc "J".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify detections between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	---	---
Multiple results: N/A				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Qualified results (J-, UJ, J) are considered valid and useable for limited purposes. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW12-EM22-R	440-255698-1	11/26/2019	1.6 ºC
SWFTS-MW12-EM22-R-FD	440-255698-2	11/26/2019	1.6 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept below 6 ºC? Were samples received in proper condition?	No/Yes/Yes
6010B: SWFTS-MW12-EM22-R and SWFTS-MW12-EM22-R-FD were not preserved to pH <2. The lab adjusted the pH with additional nitric acid three days after sampling	
RSK-175: SWFTS-MW12-EM22-R and SWFTS-MW12-EM22-R-FD were not collected in bottles with the correct septa and they were not preserved to pH <2.	
SM5310: SWFTS-MW12-EM22-R and SWFTS-MW12-EM22-R-FD were not preserved to pH <2. The lab adjusted the pH with additional HCL prior to analysis.	

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	No
RSK-175: SWFTS-MW12-EM22-R and SWFTS-MW12-EM22-R-FD were not preserved to pH <2. When discovered, it was past the holding time for unpreserved samples.	
SM5310: SWFTS-MW12-EM22-R and SWFTS-MW12-EM22-R-FD were not preserved to pH <2. When discovered, it was past the holding time for unpreserved samples. The lab adjusted the pH prior to analysis.	

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/Yes
6010B: Calcium, copper, magnesium, and zinc were detected in MB 440-583249/1-A. Calcium and magnesium concentrations in the samples were >10x the amount in the MB. Copper was not detected . Zinc was detected in one sample. Per the case narrative, several metals were detected in CCBs. Only those affecting sample results are listed below. Titanium and antimony were detected in several CCBs, but not in the samples. Selenium was detected in a CCB but the concentrations in the samples were >10x the amount in the blank.	

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
6010B: Several recoveries were outside limits in the MS and/or MSD of SWFTS-MW12-EM22-R. The concentrations in the parent sample were >4x the amount spiked, so recovery criteria do not apply.	
6020: Selenium recoveries were low in the MS/MSD of SWFTS-MW12-EM22-R. The concentration in the sample was >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/10/2020

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 15 with MS/MSD

SDG/Report No.: 440-257635-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW10A-EM23: Qualify perchlorate "J+".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW10A-EM23: Qualify unused result "R".
Multiple results: SWFTS-MW10A-EM23 was analyzed twice for nitrate. The 500x result was non-detect and used for QC. The initial 10x analysis result was detected within the calibration range. The 10x analysis result was selected.				
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
Overall Assessment: Acceptable as qualified. **Usability:** Sample results qualified "R" should not be used for reporting. Qualified results (J, J+) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW16-EM23	440-257635-1	12/17/2019	1.7 ºC
SWFTS-20191217-EB	440-257635-2	12/17/2019	1.7 ºC
SWFTS-MW11-EM23	440-257635-3	12/17/2019	1.7 ºC
SWFTS-MW11-EM23-FD	440-257635-4	12/17/2019	1.7 ºC
SWFTS-20191217-FB	440-257635-5	12/17/2019	1.7 ºC
SWFTS-MW15-EM23	440-257635-6	12/17/2019	1.7 ºC
SWFTS-MW14-EM23	440-257635-7	12/17/2019	1.7 ºC
SWFTS-MW02-EM23	440-257635-8	12/17/2019	1.7 ºC
PC-91-EM23	440-257635-9	12/17/2019	1.7 ºC
PC-92-EM23	440-257635-10	12/17/2019	1.7 ºC
SWFTS-MW10A-EM23	440-257635-11	12/17/2019	1.7 ºC
SWFTS-MW10A-EM23-MS	440-257635-11 MS	12/17/2019	1.7 ºC
SWFTS-MW10A-EM23-MSD	440-257635-11 MSD	12/17/2019	1.7 ºC
SWFTS-MW20-EM23	440-257635-12	12/17/2019	1.7 ºC
SWFTS-MW18-EM23	440-257635-13	12/17/2019	1.7 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.1B: Chlorate recoveries were outside limits in the MS/MSDs of SWFTS-MW02-EM23 and SWFTS-MW10A-EM23. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
314.0: Perchlorate recovery was high in the MSD of SWFTS-MW10A-EM23.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/07/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 11 with MS/MSD

SDG/Report No.: 440-257733-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	SWFTS-MW09A-EM23: Qualify nitrate "J+". COH-2B1-EM23: Qualify chlorate "J-".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	No	None
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	COH-2B1-EM23, SWFTS-MW05A-EM23 and SWFTS-MW09A-EM23: Qualify unused results "R".

Multiple results: The following samples were analyzed twice for sulfate: COH-2B1-EM23 (2x and 100x) and SWFTS-MW09A-EM23 (2x and 100x). The initial 2x analyses exceeded the calibration range. The 100x analyses results were used because they were within the calibration range. SWFTS-MW05A-EM23 was analyzed twice for nitrate. The 500x result was non-detect and used for QC. The initial 10x analysis result was detected within the calibration range. The 10x analysis result was selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used for reporting. Qualified results (J-, J+) are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
COH-2B1-EM23	440-257733-1	12/18/2019	2.1 ºC
SWFTS-20191218-EB	440-257733-2	12/18/2019	2.1 ºC
SWFTS-MW01-EM23	440-257733-3	12/18/2019	2.1 ºC
SWFTS-20191218-FB	440-257733-4	12/18/2019	2.1 ºC
SWFTS-MW09A-EM23	440-257733-5	12/18/2019	2.1 ºC
SWFTS-MW09B-EM23	440-257733-6	12/18/2019	2.1 ºC
SWFTS-MW21-EM23	440-257733-7	12/18/2019	2.1 ºC
SWFTS-MW05A-EM23	440-257733-8	12/18/2019	2.1 ºC
SWFTS-MW05A-EM23-MS	440-257733-8 MS	12/18/2019	2.1 ºC
SWFTS-MW05A-EM23-MSD	440-257733-8 MSD	12/18/2019	2.1 ºC
SWFTS-MW05B-EM23	440-257733-9	12/18/2019	2.1 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Nitrate recoveries were high in the MS/MSD of SWFTS-MW09A-EM23. Parent sample will be qualified. Sulfate recoveries were high in the MS/MSDs of COH-2B1-EM23 and SWFTS-MW09A-EM23. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	
300.1B: Chlorate recoveries were low in the MS/MSD of COH-2B1-EM23. Parent sample will be qualified.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	No/N/A/N/A

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/07/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 13

SDG/Report No.: 440-257866-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	PC-94-EM23, SWFTS-MW08A-EM23, SWFTS-MW19-EM23, and SWFTS-MW23-EM23: Qualify unused results "R".

Multiple results: The following samples were analyzed twice for sulfate: PC-94-EM23 (10x and 200x), SWFTS-MW08A-EM23 (10x and 500x), SWFTS-MW19-EM23 (5x and 200x), and SWFTS-MW23-EM23 (2x and 100x). The initial analyses exceeded the calibration range. The higher dilution analyses results were used because they were within the calibration range.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used for reporting. Results qualified "J" are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW19-EM23	440-257866-1	12/19/2019	4.1 ºC
SWFTS-MW19-EM23-FD	440-257866-2	12/19/2019	4.1 ºC
SWFTS-MW22-EM23	440-257866-3	12/19/2019	4.1 ºC
PC-94-EM23	440-257866-4	12/19/2019	4.1 ºC
SWFTS-MW03-EM23	440-257866-5	12/19/2019	4.1 ºC
SWFTS-MW24-EM23	440-257866-6	12/19/2019	4.1 ºC
SWFTS-MW23-EM23	440-257866-7	12/19/2019	4.1 ºC
SWFTS-MW25-EM23	440-257866-8	12/19/2019	4.1 ºC
SWFTS-MW06A-EM23	440-257866-9	12/19/2019	4.1 ºC
SWFTS-MW06A-EM23-FD	440-257866-10	12/19/2019	4.1 ºC
SWFTS-MW06B-EM23	440-257866-11	12/19/2019	4.1 ºC
SWFTS-MW04-EM23	440-257866-12	12/19/2019	4.1 ºC
SWFTS-MW08A-EM23	440-257866-13	12/19/2019	4.1 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were high in the MSs and/or MSDs of SWFTS-MW19-EM23, PC-94-EM23, SWFTS-MW23-EM23, and SWFTS-MW08A-EM23. The concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/07/19

Project Name: SWF Area Treatability Study
Task No.: M11
No. of Samples: 9

SDG/Report No.: 440-257938-1
Lab ID: Eurofins TestAmerica
Matrix: Water

Area Reviewed	Anomalies		Qualification Required	Action Required
	Yes	No	Yes or No	
1. Sample Preservation, Handling, and Transport		X	No	None
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks		X	No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		No	None
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results between the MDL/SQL and RL/PQL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Multiple Results (see below)	---	---	Yes	SWFTS-MW13-EM23, PC-97-EM23, PC-58-EM23: Qualify unused results "R".

Multiple results: The following samples were analyzed twice for sulfate: SWFTS-MW13-EM23 (20x and 500x), PC-97-EM23 (2x and 100x), and PC-58-EM23 (5x and 200x). The initial analyses results exceeded the calibration range. The higher dilution results were within the calibration range and were selected.

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified "R" should not be used for reporting. Results qualified "J" are considered useable for limited purposes. All other results are considered valid and useable for all purposes.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
SWFTS-MW12-EM23	440-257938-1	12/20/2019	1.2 ºC
SWFTS-MW17-EM23	440-257938-2	12/20/2019	1.2 ºC
SWFTS-MW13-EM23	440-257938-3	12/20/2019	1.2 ºC
SWFTS-MW07A-EM23	440-257938-4	12/20/2019	1.2 ºC
SWFTS-MW07B-EM23	440-257938-5	12/20/2019	1.2 ºC
PC-97-EM23	440-257938-6	12/20/2019	1.2 ºC
PC-88-EM23	440-257938-7	12/20/2019	1.2 ºC
PC-88-EM23-FD	440-257938-8	12/20/2019	1.2 ºC
PC-58-EM23	440-257938-9	12/20/2019	1.2 ºC

The following section is intended to specify areas evaluated and issues encountered. Only applicable methods are listed.

1. Sample Preservation, Handling, and Transport	
Were all samples preserved correctly? Were sample temperatures kept at < 6 ºC? Were samples received in proper condition?	Yes/Yes/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes

3. Holding Times	
Were samples analyzed within acceptable holding times?	Yes

4. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were analytes detected in any blanks?	Yes/Yes/No

5. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported correctly on data forms? Were recoveries within laboratory limits?	Yes/Yes/Yes

6. Matrix Spike/Matrix Spike Duplicate	
Was a MS/MSD pair extracted and/or analyzed with each batch? Were recoveries/RPDs reported on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
300.0: Sulfate recoveries were outside limits in the MS/MSDs of SWFTS-MW13-EM23, PC-58-EM23 and PC-97-EM23. The sulfate concentrations in the parent samples were >4x the amount spiked, so recovery criteria do not apply.	

7. Laboratory Control Samples (LCS)	
Was a LCS analyzed with each analytical batch? Were LCS recoveries reported correctly on data forms? Were LCS recoveries within laboratory established limits?	Yes/Yes/Yes

8. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL/PQL, were RPDs between parent sample and duplicates ≤ lab limits or ≤ 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL/PQL, were differences between the two values < RL/PQL.	Yes/Yes/Yes

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs/PQL) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes

10. Data Package/EDD comparison (10%)	
Were 10% of the data package results compared to the electronic data? Did results match?	Yes/Yes

Validated by: Maureen McMyler 01/09/19

Appendix 2
Laboratory Data Packages

Due to the quantity and size of the file, the laboratory data packages are being sent in a separate file for electronic download.

Appendix 3
DVSR Electronic Data Deliverable

Per the requirements provided by NDEP for Unified Chemical Electronic Data Deliverable Format (July 18, 2018), a database is provided in Microsoft Access format and includes sample, location and analytical data supporting the DVSR and for upload of the Companies' electronic data into the regional database maintained by NDEP. Associated data in the NDEP Water Level Electronic Data Deliverable Format (February 28, 2010) have also been provided in a second Microsoft Access file. These databases are being sent in a separate file for electronic download.