

Data Validation Summary Report (DVSR ID: TetraTech-M12Addendum-2019rev1) Addendum to the In-Situ Chromium Treatability Study Results Report Nevada Environmental Response Trust Site Henderson, Nevada

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April 15, 2019

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LIST OF ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
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
EDL	estimated detection limit
EMPC	estimated maximum possible concentration
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/LCSD	laboratory control sample/laboratory control sample duplicate
MDL	method detection limit
mg/kg	milligram per kilogram
mg/L	milligram per liter
MS/MSD	matrix spike/matrix spike duplicate
MSI	matrix spike-insoluble
N	normal field sample
N/A	not applicable
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

Acronyms/Abbreviations	Definition
PARCCS	precision, accuracy, representativeness, comparability, completeness, sensitivity
PQL	practical quantitation limit
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
SDG	sample delivery group
SO	soil
SQL	sample quantitation limit
SVOC	semivolatile organic compound
Tetra Tech	Tetra Tech, Inc.
Treatability Study	In-Situ Chromium Treatability Study
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
VOC	volatile organic compound
WG	groundwater
WQ	water quality

CERTIFICATION

**Data Validation Summary Report
(DVSR ID: Tetra Tech-M12 Addendum-2019rev1)
Addendum to the In-Situ Chromium Treatability Study Results 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.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Signature: Jay A Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Not Individually, but Solely as President of the Trustee

Name: Jay A Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Title: Solely as President and not individually

Company: Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Date: 4/18/19

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, (DVSR ID: Tetra Tech-M12 Addendum-2019rev1), Addendum to the In-Situ Chromium Treatability Study Results Report



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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 additional groundwater monitoring completed for the biological reduction study component of the In-Situ Chromium Treatability Study (Treatability Study) for the NERT site, located in Clark County, Nevada. Sampling protocol can be found in the *In-Situ Chromium Treatability Study Work Plan* (Tetra Tech, 2016). Tetra Tech performed the Treatability Study, which included the collection and analyses of samples to assess the effectiveness of the Treatability Study. Tetra Tech collected additional quality assurance and quality control (QA/QC) samples to aid in assessing data quality. Data associated with the In-Situ Chromium Treatability Study that were submitted previously as an appendix to the *In-Situ Chromium Treatability Study Results Report* (Tetra Tech, 2018) are not included in this DVSR.

TestAmerica provided laboratory analytical services. The analyses were performed by the methods shown in Table 1.

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 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 laboratory analytical data were verified and validated in accordance with procedures described in the *Quality Assurance Project Plan, Revision 2* (Ramboll Environ, 2017), *NDEP Data Verification and Validation Requirements* (NDEP, 2018), and the references contained therein. Analytical field sample results from groundwater and field quality blanks were validated to Stage 2A. Approximately ninety percent of the analytical results from soil were validated to Stage 2B and at least ten percent were validated to Stage 4.

Data validation checklists are compiled in Appendix E.1. Laboratory data packages may be found in Appendix E.2. A database of the analytical results is provided in Appendix E.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 duplicates (FDs), and matrix spike/matrix spike duplicates (MS/MSDs), and trip blanks (TBs). Laboratory QA/QC samples include method blanks, laboratory control samples/laboratory control sample duplicates (LCS/LCSDs), laboratory duplicates (DUP), matrix spike-insoluble (MSI) samples, 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 or LCS/LCSD pair can be analyzed as an alternative means of assessing precision. An additional measure of sampling precision is obtained by collecting and analyzing field duplicate 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. The MSI is used to evaluate soil samples that are analyzed by methods developed for waters. 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. 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 LCS/LCSD 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, MSI, LCS, and LCSD. 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, MSIs, and LCS/LCSD is evaluated with the acceptance criteria specified by the QAPP 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 TBs.

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.

TBs consist of analyte-free water prepared at the laboratory, shipped to the field with sample containers, and returned to the laboratory with the samples receiving volatile organic compound (VOC) analysis. The trip blank is analyzed for VOCs using the same sample preparation and analysis procedures used for the actual field samples.

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. The qualifiers and bias recommendations are taken from USEPA National Functional Guidelines (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 QAPP, with the number determined above.

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 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 according to the QAPP in place at the time of validation (Ramboll Environ, 2017).

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 each validation level. 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 an 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 method SW-8260B and provides a means of evaluating precision within an analytical system. Calibration criteria are not reviewed in Stage 2A validation.

3.1.2 MS/MSD and Laboratory Duplicate Samples

MS/MSD and laboratory duplicate RPDs were within the acceptance criteria stated in the QAPP.

3.1.3 LCS/LCSD Samples

No data were qualified for LCS/LCSD RPD outliers.

3.1.4 Field Duplicate Samples

For results > 5X the PQL, the FD samples were evaluated for acceptable precision with RPDs. If one or both results was < 5X the PQL, samples were evaluated by the difference between the two measurements. Table 7 includes results where RPDs exceeded 30 percent for water or 50 percent for soils, or the difference between the values was greater than the absolute value of the PQL. Ten results were qualified for imprecision between the

parent and FD. They are found in Table 6 with reason code “fd.” The parent sample and the FD were qualified “J” for 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 criteria are not reviewed in Stage 2A validation. In cases where an outlier is mentioned in the case narrative, the outlier is reviewed and may be qualified. For method SW-8260B, 2,2-dichloropropane %D was 35.3% in CCV sample CCVIS 440-485540/2. The allowed limit is 30%. Two 2,2-dichloropropane results were qualified “UJ.” They are found in Table 6 with reason code “c.”

3.2.2 MS/MSD and MSI Samples

Several MS/MSD %Rs were outside of acceptance criteria shown in the QAPP. 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 FDs were analyzed in the same SDG. Table 8 contains the spiked sample only. In cases where dilutions caused the low recoveries, the data were not rejected or qualified. Per the inorganic NFG, MS/MSD recoveries < 30% resulted in rejection of the 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 approaches this on a case-by-case basis. Twenty-six results were qualified for MS/MSD %Rs. Seven results were rejected. Associated results qualified for MS/MSD recoveries can be found in Table 6 with reason code “m.”

3.2.3 LCS/LCSD Samples

No data were qualified for LCS/LCSD %R outliers.

3.2.4 Surrogates

Surrogates are added to all samples analyzed by EPA 300.1B and SW-8260B to measure the efficiency of the analytical method. No data were qualified for surrogate recovery outliers.

3.3 REPRESENTATIVENESS

3.3.1 Sample Condition, Preservation, and Holding Times

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

Two methane results were qualified “J” because they were received at the lab with headspace. They are designated with reason code “vh” for volatile headspace in Table 6. The samples are shown in Table 9.

Two TOC results were qualified for improper preservation and holding time infractions, designated with reason codes “h” for holding time and “pH” for preservation in Table 6. The samples were collected in jars 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 preservation infractions are shown in Table 9. The holding time exceedances are shown in Table 10. The results were qualified “J-”.

Six samples analyzed for VOCs by SW-8260B and three samples analyzed for methane by RSK175 were analyzed outside of the 7-day analytical holding time for unpreserved samples. The samples were collected in vials containing HCl, but when checked prior to analysis, the pH was >2. 263 undetected VOC compound results were qualified “UJ” according to current NDEP guidance. Fifteen VOC results were qualified “J.” No bias was assigned to the VOC detected results, based on NFG and professional judgment. The methane results were qualified “J-.” All are designated with reason code “h” in Table 6. The holding time exceedances are shown in Table 10.

3.3.2 Blanks

Method blanks, ICBs, CCBs, EBs, and TBs 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 radiochemistry methods, the normalized difference was used to determine if sample results differed from blank results.

For concentrations detected in the sample below the PQL, the sample result was qualified “J.” Based on the 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 results were qualified “J+.”

3.3.2.1 Method and Calibration Blanks

Several contaminants were detected in the laboratory blanks. Fifteen results were qualified because of contamination in laboratory blanks. Laboratory blank detections, including preparation and calibration blanks, that resulted in qualification are shown in Table 11. Qualified results are shown in Table 6 with reason code “bl.”

3.3.2.2 Equipment Blanks and Trip Blanks

There were three detections in the EBs and TBs associated with this dataset. Hexavalent chromium was detected in CTMW-07D-130.0-20170922-EB at a concentration of 0.39 µg/L. Tetrachloroethene and methylene chloride were detected in M12-20180622-TB at concentrations of 0.38 µg/L and 1 µg/L, respectively. No associated data required qualification.

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. A total of 132 qualified results are shown with reason code “sp” in Table 6. The comparability of the data is acceptable.

3.5 COMPLETENESS

The completeness level attained for the field samples, equipment blanks, and trip blanks is 99.8% and meets the project goal of 90 percent. Seven results were rejected because of MS/MSD recoveries. 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. A completeness summary by method is provided in Table 12.

3.6 SENSITIVITY

Due to high analyte concentrations, many analytical runs were analyzed at dilutions. For diluted analyses, SQLs and PQLs were elevated.

In Stage 2A validation, the calibrations are not evaluated for instrument sensitivity. In cases where an outlier is known however, the outlier will be qualified. For method SW-8260B, the relative response factor (RRF) for 1,1,2-trichloroethane in ICAL 17676 was 0.1809. In CCVIS 440-435536/2, the 1,1,2-trichloroethane RRF was 0.1899. The organic NFG requires an RRF of 0.200 for this compound and recommends rejecting the data point. Since method SW-8260B and the lab’s operating procedure do not require a minimum RRF for 1,1,2-trichloroethane, the validator using professional judgment qualified the result “UJ.” The PQL may be inaccurate or imprecise. One 1,1,2-trichloroethane result in CTMW-07D-20171009 was qualified “UJ” and found in Table 6 with reason code “c.”

4.0 CONCLUSIONS AND RECOMMENDATIONS

The analytical data quality assessment for the soil and water laboratory analytical results generated during the additional sampling at the In-Situ Treatability Study site at the NERT site in Henderson, Nevada, established that the overall project requirements and completeness levels were met. Most sample results were found to be usable. Seven results were rejected because of MS/MSD recoveries. Rejected results are not usable. Sample results that were qualified as estimated are usable for limited purposes only.

5.0 REFERENCES

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

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

Tetra Tech. (2016). *In-Situ Chromium Treatability Study Work Plan*.

Tetra Tech. (2018). *In-Situ Chromium Treatability Study Results Report*.

Tables

Table 1 Analytical Methods

Method	Parameters	Number of Aqueous Samples	Number of Soil Samples
EPA 300.0	Chloride	21	0
EPA 300.0	Nitrate [as N]	21	0
EPA 300.0	Sulfate	21	0
EPA 300.1B	Chlorate	25	9
EPA 300.1B	Chlorite	21	0
EPA 314.0	Perchlorate	25	9
EPA 351.2	Total Kjeldahl Nitrogen [TKN]	21	0
EPA 365.3	Orthophosphate (as P), Phosphate, Phosphorus	21	0
RSK175	Methane	21	0
SM2320B	Alkalinity as CaCO ₃ , Bicarbonate as CaCO ₃ , Carbonate as CaCO ₃ , and Hydroxide as CaCO ₃	21	0
SM2340C	Hardness as CaCO ₃	21	0
SM2540C	Total Dissolved Solids [TDS]	21	0
SM4500-S2-D	Sulfide	21	0
SM5220D	Chemical Oxygen Demand	10	0
SM5310B	Total Organic Carbon	21	0
SW-6010B	Metals	25	9
SW-6020A	Metals	21	0
SW-7199	Chromium [VI]	25	9
SW-8260B	Volatile Organic Compounds	33	9
VFA-IC	Volatile Fatty Acids	21	0

Table 2 Sample Cross-Reference

SDG	Client Sample ID	Lab Sample ID	Matrix	Type	Sample Date	Validation Stage	EPA 300.0	EPA 300.1B	EPA 314.0	EPA 351.2	EPA 365.3	RSK175	SM2320B	SM2340C	SM2540C	SM4500-S2-D	SM5220D	SM5310B	SW-6010B	Dissolved SW-6020A	SW-7199	SW-8260B	VFA-IC
440-192727-1	CTMW-07D-50.0-20170921	440-192727-1	WG	NORM	2017-09-21	Stage 2A		X	X										X		X	X	
440-192727-1	CTMW-07D-60.0-20170921	440-192727-2	SO	NORM	2017-09-21	Stage 2B		X	X										X		X	X	
440-192727-1	CTMW-07D-70.0-20170921-GW	440-192727-3	WG	NORM	2017-09-21	Stage 2A		X	X										X		X	X	
440-192727-1	CTMW-07D-70.0-20170921-SO	440-192727-4	SO	NORM	2017-09-21	Stage 2B		X	X										X		X	X	
440-192727-1	Trip_Blank-M12-20170921*	440-192727-5	BW	TB	2017-09-21	Stage 2A																	X
440-192727-1	CTMW-07D-80.0-20170921	440-192727-6	SO	NORM	2017-09-21	Stage 2B		X	X										X		X	X	
440-192727-1	CTMW-07D-90.0-20170921	440-192727-7	SO	NORM	2017-09-21	Stage 2B		X	X										X		X	X	
440-192727-1	CTMW-07D-100.0-20170921	440-192727-8	SO	NORM	2017-09-21	Stage 2B		X	X										X		X	X	
440-192727-1	CTMW-07D-110.0-20170921	440-192727-9	SO	NORM	2017-09-21	Stage 2B		X	X										X		X	X	
440-192727-1	CTMW-07-D-60.0-20170921-EB	440-192727-10	BW	EB	2017-09-21	Stage 2A		X	X										X		X	X	
440-192727-1	CTMW-07D-90.0-20170921-FD	440-192727-11	SO	FD	2017-09-21	Stage 2B		X	X										X		X	X	
440-192817-1	CTMW-07D-120.0-20170922	440-192817-1	SO	NORM	2017-09-22	Stage 2B		X	X										X		X	X	
440-192817-1	CTMW-07D-130.0-20170922-EB	440-192817-2	BW	EB	2017-09-22	Stage 2A		X	X										X		X	X	
440-192817-1	Trip_Blank-M12-20170922*	440-192817-3	BW	TB	2017-09-22	Stage 2A																	X
440-192835-1	CTMW-07D-130.0-20170922	440-192835-1	SO	NORM	2017-09-22	Stage 4		X	X										X		X	X	
440-193864-1	Trip_Blank-M12-20171009*	440-193864-1	BW	TB	2017-10-09	Stage 2A																	X
440-193864-1	CTMW-07D-20171009	440-193864-2	WG	NORM	2017-10-09	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	Trip_Blank-M12-20180305*	440-204893-1	BW	TB	2018-03-05	Stage 2A																	X
440-204893-1	CTMW-01S-20180305	440-204893-2	WG	NORM	2018-03-05	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	CTMW-01D-20180305	440-204893-3	WG	NORM	2018-03-05	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	CTMW-01D-20180305-FD	440-204893-4	WG	FD	2018-03-05	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	CTMW-02D-20180305	440-204893-5	WG	NORM	2018-03-05	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	Trip_Blank-M12-20180306*	440-204893-6	BW	TB	2018-03-06	Stage 2A																	X
440-204893-1	CTMW-02S-20180306	440-204893-7	WG	NORM	2018-03-06	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	CTMW-07D-20180306	440-204893-8	WG	NORM	2018-03-06	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	CTMW-07S-20180306	440-204893-9	WG	NORM	2018-03-06	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-204893-1	CTMW-06S-20180306	440-204893-10	WG	NORM	2018-03-06	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-205188-1	Trip_Blank-M12-20180307*	440-205188-1	BW	TB	2018-03-07	Stage 2A																	X
440-205188-1	CTMW-06D-20180307	440-205188-2	WG	NORM	2018-03-07	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-205188-1	CTMW-04S-20180307	440-205188-3	WG	NORM	2018-03-07	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-205188-2	CTMW-04D-20180307	440-205188-4	WG	NORM	2018-03-07	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214187-1	CTMW-01S-20180621	440-214187-1	WG	NORM	2018-06-21	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214187-1	CTMW-01D-20180621	440-214187-2	WG	NORM	2018-06-21	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214187-1	CTMW-01D-20180621-FD	440-214187-3	WG	FD	2018-06-21	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214187-1	CTMW-02D-20180621	440-214187-4	WG	NORM	2018-06-21	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214189-1	CTMW-04S-20180621	440-214189-1	WG	NORM	2018-06-21	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214189-1	CTMW-04D-20180621	440-214189-2	WG	NORM	2018-06-21	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214189-1	M12-20180621-TB	440-214189-3	BW	TB	2018-06-21	Stage 2A																	X
440-214285-1	M12-20180622-TB	440-214285-1	BW	TB	2018-06-22	Stage 2A																	X
440-214285-1	CTMW-06S-20180622	440-214285-2	WG	NORM	2018-06-22	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214285-1	CTMW-06D-20180622	440-214285-3	WG	NORM	2018-06-22	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
440-214285-1	CTMW-07D-20180622	440-214285-4	WG	NORM	2018-06-22	Stage 2A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

* Samples designated as "Trip Blank" on chain-of-custody forms were changed to unique IDs in the database.

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.
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 and Stages

Verification and Validation Checks	Stage 2A	Stage 2B	Stage 4
Documentation identifies the laboratory receiving and conducting analyses, and includes documentation for all samples submitted by the project or requester for analyses.	X	X	X
Requested analytical methods were performed and the analysis dates are present.	X	X	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	X	X
Requested target analyte result units are reported (along with their associated uncertainty units if required, e.g., for radiochemical analyses).	X	X	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	X	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	X	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	X	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	X	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	X	X
Requested methods (handling, preparation, cleanup, and analytical) are performed.	X	X	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	X	X
Sample-related QC data and QC acceptance criteria (e.g., method blanks, surrogate recoveries, deuterated monitoring compounds (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	X	X
Requested spike analytes or compounds (e.g., surrogate, DMCs, LCS spikes, post digestion spikes) have been added, as appropriate.	X	X	X
Sample holding times (from sampling date to preparation and preparation to analysis) are evaluated.	X	X	X
Frequency of QC samples is checked for appropriateness (e.g., one LCS per 20 samples in a preparation batch).	X	X	X

Table 4 Validation Checks and Stages

Verification and Validation Checks	Stage 2A	Stage 2B	Stage 4
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	X	X
Initial calibration data (e.g., initial calibration standards, initial calibration verification [ICV] standards, initial calibration blanks [ICBs]) are provided for all requested analytes and linked to field samples reported. For each initial calibration, the calibration type used is present along with the initial calibration equation used including any weighting factor(s) applied and the associated correlation coefficients, as appropriate. Recalculations of the standard concentrations using the initial calibration curve are present, along with their associated percent recoveries, as appropriate (e.g., if required by the project, method, or contract). For the ICV standard, the associated percent recovery (or percent difference, as appropriate) is present.		X	X
Appropriate number and concentration of initial calibration standards are present.		X	X
Continuing calibration data (e.g., continuing calibration verification [CCV] standards and continuing calibration blanks [CCBs]) are provided for all requested analytes and linked to field samples reported, as appropriate. For the CCV standard(s), the associated percent recoveries (or percent differences, as appropriate) are present.		X	X
Reported samples are bracketed by CCV standards and CCBs standards as appropriate.		X	X
Method specific instrument performance checks are present as appropriate (e.g., tunes for mass spectrometry methods, DDT/Endrin breakdown checks for pesticides and aroclors, instrument blanks and interference checks for ICP methods).		X	X
Frequency of instrument QC samples is checked for appropriateness (e.g., gas chromatography-mass spectroscopy [GC-MS] tunes have been run every 12 hours).		X	X
Sample results are evaluated by comparing instrument-related QC data to the requirements and guidelines present in national or regional data validation documents, analytical method(s), or contract.		X	X
Instrument response data (e.g., GC peak areas, ICP corrected intensities) are reported for requested analytes, surrogates, internal standards, and DMCs for all requested field samples, matrix spikes, matrix spike duplicates, LCS, and method blanks, as well as calibration data and instrument QC checks (e.g., tunes, DDT/Endrin breakdowns, interelement correction factors, and Florisil cartridge checks).			X
Reported target analyte instrument responses are associated with appropriate internal standard analyte(s) for each (or selected) analyte(s) (for methods using internal standard for calibration).			X
Fit and appropriateness of the initial calibration curve used or required (e.g., mean calibration factor, regression analysis [linear or non-linear, with or without weighting factors, with or without forcing]) is checked with recalculation of the initial calibration curve for each (or selected) analyte(s) from the instrument response.			X
Comparison of instrument response to the minimum response requirements for each (or selected) analyte(s)			X

Table 4 Validation Checks and Stages

Verification and Validation Checks	Stage 2A	Stage 2B	Stage 4
Recalculation of each (or selected) opening and closing CCV (and CCB) response from the peak data reported for each (or selected) analyte(s) from the instrument response, as appropriate			X
Compliance check of recalculated opening and/or closing CCV (and CCB) response to recalculated initial calibration response for each (or selected) analyte(s)			X
Recalculation of percent ratios for each (or selected) tune from the instrument response, as appropriate			X
Compliance check of recalculated percent ratio for each (or selected) tune from the instrument response.			X
Recalculation of each (or selected) instrument performance check (e.g., DDT/Endrin breakdown for pesticide analysis, instrument blanks, interference checks) from the instrument response			X
Recalculation and compliance check of retention time windows (for chromatographic methods) for each (or selected) analyte(s) from the laboratory reported retention times			X
Recalculation of reported results for each reported (or selected) target analyte(s) from the instrument response			X
Recalculation of each (or selected) reported spike recovery (surrogate recoveries, DMC recoveries, LCS recoveries, duplicate analyses, matrix spike and matrix spike duplicate recoveries, serial dilutions, post digestion spikes, standard reference materials, etc.) from the instrument response			X
Each (or selected) sample result(s) and spike recovery(ies) are evaluated by comparing the recalculated numbers to the laboratory reported numbers according to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract.			X
All required instrument outputs (e.g., chromatograms, mass spectra, atomic emission spectra, instrument background corrections, and interference corrections) for evaluating sample and instrument performance are present.			X
Sample results are evaluated by checking each (or selected) instrument output (e.g., chromatograms, mass spectra, atomic emission spectra data, instrument background corrections, interference corrections) for correct identification and quantitation of analytes (e.g., peak integrations, use of appropriate internal standards for quantitation, elution order of analytes, and interferences).			X
Each (or selected) instrument's output(s) is evaluated for confirmation of non-detected or tentatively identified analytes.			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)
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	Analyte	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-192727-1	CTMW-07D-50.0-20170921	9/21/2017	SW-8260B	Total	Chloroform	720	ug/L		2.5	5	J	h	Holding Time
440-192727-1	CTMW-07D-70.0-20170921-GW	9/21/2017	SW-8260B	Total	Chloroform	500	ug/L		2.5	5	J	h	Holding Time
440-192727-1	CTMW-07D-80.0-20170921	9/21/2017	EPA 314.0	N/A	Perchlorate	1.2	mg/kg	F1	0.027	0.11	J-	m	MS Recovery
440-192727-1	CTMW-07D-90.0-20170921	9/21/2017	EPA 300.1B	N/A	Chlorate	180	ug/kg	J	70	280	J	sp	Detect < PQL
440-192727-1	CTMW-07D-90.0-20170921-FD	9/21/2017	EPA 300.1B	N/A	Chlorate	180	ug/kg	J	70	280	J	sp	Detect < PQL
440-192817-1	CTMW-07D-130.0-20170922-EB	9/22/2017	SW-7199	Dissolved	Chromium [VI]	0.39	ug/L	J	0.25	2	J	sp	Detect < PQL
440-193864-1	CTMW-07D-20171009	10/9/2017	RSK175	Total	Methane	0.0005	mg/L	J	0.00025	0.00099	J	sp	Detect < PQL
440-193864-1	CTMW-07D-20171009	10/9/2017	SW-6020A	Dissolved	Antimony	1.1	ug/L	J	0.5	2	J	sp	Detect < PQL
440-193864-1	CTMW-07D-20171009	10/9/2017	SW-6020A	Dissolved	Copper	0.55	ug/L	J	0.5	2	J	sp	Detect < PQL
440-193864-1	CTMW-07D-20171009	10/9/2017	SW-6020A	Dissolved	Iron	20	ug/L	J	8	20	J+	bl	Lab Blank
440-193864-1	CTMW-07D-20171009	10/9/2017	SW-6020A	Dissolved	Nickel	0.68	ug/L	J	0.5	2	J	sp	Detect < PQL
440-193864-1	CTMW-07D-20171009	10/9/2017	SW-6020A	Dissolved	Zinc	2.5	ug/L	J	2.5	20	J	sp	Detect < PQL
440-193864-1	CTMW-07D-20171009	10/9/2017	SW-8260B	Total	1,1,2-Trichloroethane	0.25	ug/L	U	0.25	0.5	UJ	c	Calibration
440-204893-1	CTMW-01D-20180305	3/5/2018	EPA 365.3	Total	Orthophosphate (as P)	0.072	mg/L	F1	0.02	0.05	J	fd,m	FD, MS Recovery
440-204893-1	CTMW-01D-20180305	3/5/2018	EPA 365.3	Total	Phosphate	0.22	mg/L	F1	0.06	0.15	J	fd,m	FD, MS Recovery
440-204893-1	CTMW-01D-20180305	3/5/2018	SW-6020A	Dissolved	Nickel	4.7	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305	3/5/2018	SW-6020A	Dissolved	Selenium	4.7	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305	3/5/2018	SW-6020A	Dissolved	Zinc	45	ug/L	J	13	100	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305	3/5/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	13	ug/L	J	8.8	20	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	EPA 300.0	Total	Nitrate [as N]	5	mg/L	J	2.8	5.5	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	EPA 365.3	Total	Orthophosphate (as P)	0.17	mg/L	J	0.02	0.05	J	fd,m	FD, MS Recovery
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	EPA 365.3	Total	Phosphate	0.51	mg/L	J	0.06	0.15	J	fd,m	FD, MS Recovery
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	SW-6020A	Dissolved	Copper	2.6	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	SW-6020A	Dissolved	Nickel	4.6	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	SW-6020A	Dissolved	Vanadium	9.9	ug/L	J	5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	SW-6020A	Dissolved	Zinc	50	ug/L	J	13	100	J	sp	Detect < PQL
440-204893-1	CTMW-01D-20180305-FD	3/5/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	12	ug/L	J	8.8	20	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	RSK175	Total	Methane	2.9	mg/L	J	0.5	1	J-	h	Holding Time
440-204893-1	CTMW-01S-20180305	3/5/2018	SM4500-S2-D	Total	Sulfide	0.031	mg/L	J	0.027	0.05	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SM5310B	Total	Total Organic Carbon	1200	mg/L	J	65	100	J-	h,pH	Holding Time, Preservation
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-6020A	Dissolved	Copper	7.2	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-6020A	Dissolved	Nickel	2.9	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-6020A	Dissolved	Vanadium	6.1	ug/L	J	5	10	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-6020A	Dissolved	Zinc	13	ug/L	J	13	100	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-8260B	Total	1,2,4-Trichlorobenzene	0.49	ug/L	J	0.4	1	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-8260B	Total	1,2-Dichlorobenzene	0.45	ug/L	J	0.25	0.5	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-8260B	Total	2-Hexanone	4.5	ug/L	J	2.5	5	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-8260B	Total	Benzene	0.44	ug/L	J	0.25	0.5	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	1.4	ug/L	J	0.88	2	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	SW-8260B	Total	MTBE [Methyl tert-butyl ether]	0.36	ug/L	J	0.25	0.5	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	VFA	Total	Formic-acid	3.6	mg/L	J	2.6	10	J	sp	Detect < PQL
440-204893-1	CTMW-01S-20180305	3/5/2018	VFA	Total	n-Butyric Acid	8.5	mg/L	J	2.6	10	J	sp	Detect < PQL
440-204893-1	CTMW-02D-20180305	3/5/2018	SW-6020A	Dissolved	Nickel	2.8	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-02D-20180305	3/5/2018	SW-6020A	Dissolved	Selenium	4	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-02D-20180305	3/5/2018	SW-8260B	Total	1,2-Dichlorobenzene	7.5	ug/L	J	5	10	J	sp	Detect < PQL
440-204893-1	CTMW-02D-20180305	3/5/2018	VFA	Total	Formic-acid	3.6	mg/L	J	2.6	10	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	EPA 300.0	Total	Sulfate	6.7	mg/L	J	5	10	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	RSK175	Total	Methane	3.9	mg/L	J	0.5	1	J-	h	Holding Time
440-204893-1	CTMW-02S-20180306	3/6/2018	SM5310B	Total	Total Organic Carbon	35	mg/L	J	0.65	1	J-	h,pH	Holding Time, Preservation
440-204893-1	CTMW-02S-20180306	3/6/2018	SW-6020A	Dissolved	Nickel	6.8	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	SW-6020A	Dissolved	Uranium	2.5	ug/L	J	2.5	5	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	SW-6020A	Dissolved	Vanadium	8.2	ug/L	J	5	10	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	SW-8260B	Total	1,2,4-Trichlorobenzene	0.43	ug/L	J	0.4	1	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	SW-8260B	Total	1,3-Dichlorobenzene	0.28	ug/L	J	0.25	0.5	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	SW-8260B	Total	1,4-Dichlorobenzene	0.36	ug/L	J	0.25	0.5	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	SW-8260B	Total	MTBE [Methyl tert-butyl ether]	0.3	ug/L	J	0.25	0.5	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	VFA	Total	Acetic acid	4.6	mg/L	J	2.9	10	J	sp	Detect < PQL
440-204893-1	CTMW-02S-20180306	3/6/2018	VFA	Total	Formic-acid	3.6	mg/L	J	2.6	10	J	sp	Detect < PQL
440-204893-1	CTMW-06S-20180306	3/6/2018	EPA 300.0	Total	Sulfate	6.4	mg/L	J	5	10	J	sp	Detect < PQL
440-204893-1	CTMW-06S-20180306	3/6/2018	RSK175	Total	Methane	6	mg/L	J	0.5	1	J-	h	Holding Time
440-204893-1	CTMW-06S-20180306	3/6/2018	SW-6020A	Dissolved	Iron	89	ug/L	J	40	100	J	sp	Detect < PQL
440-204893-1	CTMW-06S-20180306	3/6/2018	SW-6020A	Dissolved	Nickel	3.3	ug/L	J	2.5	10	J	sp	Detect < PQL
440-204893-1	CTMW-06S-20180306	3/6/2018	SW-8260B	Total	1,2,3-Trichlorobenzene	0.64	ug/L	J	0.4	1	J	sp	Detect < PQL

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,1,1-Trichloroethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,1,2,2-Tetrachloroethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,1,2-Trichloroethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,1-Dichloroethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,1-Dichloroethene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,1-Dichloropropene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,2,3-Trichlorobenzene	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,2,3-Trichloropropane	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,2,4-Trichlorobenzene	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,2,4-Trimethylbenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,2-Dichlorobenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,2-Dichloroethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,2-Dichloropropane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,3,5-Trimethylbenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,3-Dichlorobenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,3-Dichloropropane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	1,4-Dichlorobenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	2,2-Dichloropropane	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	2-Chlorotoluene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	2-Hexanone	50	ug/L	U	50	100	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	2-Methoxy-2-methyl-butane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	4-Chlorotoluene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	4-Methyl-2-pentanone [MIBK]	50	ug/L	U	50	100	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Acetone	510	ug/L	U	200	400	J	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Benzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Bromobenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Bromodichloromethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Bromoform	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Bromomethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Carbon tetrachloride	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Chlorobenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Chlorobromomethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Chloroethane	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Chloroform	1500	ug/L	U	5	10	J	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Chloromethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	cis-1,2-Dichloroethene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	cis-1,3-Dichloropropene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Cymene [Isopropyltoluene]	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Dibromochloromethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Dibromochloropropane	10	ug/L	U	10	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Dibromomethane	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	36	ug/L	J	18	40	J	h,sp	Holding Time, Detect < PQL
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Diisopropyl ether	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Ethane, 1,2-dibromo-	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Ethyl tert-butyl ether	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Ethylbenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Freon-11 [Trichlorofluoromethane]	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Freon-12 [Dichlorodifluoromethane]	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Hexachlorobutadiene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Isopropylbenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	m,p-Xylene	10	ug/L	U	10	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Methyl ethyl ketone [2-Butanone]	1300	ug/L	U	50	100	J	fd,h	FD, Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	MTBE [Methyl tert-butyl ether]	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Naphthalene	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	n-Butyl benzene	8	ug/L	U	8	20	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	n-Propylbenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	o-Xylene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	sec-Butylbenzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Styrene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	tert-Butyl alcohol	100	ug/L	U	100	200	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	tert-Butyl benzene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Tetrachloroethene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Toluene	5	ug/L	U	5	10	UJ	h	Holding Time

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	trans-1,2-Dichloroethene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	trans-1,3-Dichloropropene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Trichloroethene	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Vinyl chloride	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01D-20180621-FD	6/21/2018	SW-8260B	Total	Xylenes [total]	10	ug/L	U	10	20	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	RSK175	Total	Methane	0.87	mg/L		0.00025	0.00099	J	vh	Head Space
440-214187-1	CTMW-01S-20180621	6/21/2018	SM4500-S2-D	Total	Sulfide	0.041	mg/L	J	0.027	0.05	J	sp	Detect < PQL
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-6020A	Dissolved	Antimony	2.7	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-6020A	Dissolved	Nickel	9	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-6020A	Dissolved	Selenium	2.7	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-6020A	Dissolved	Uranium	4.5	ug/L	J	2.5	5	J	sp	Detect < PQL
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,1,1,2-Tetrachloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,1,1-Trichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,1,2,2-Tetrachloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,1,2-Trichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,1-Dichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,1-Dichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,1-Dichloropropene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,2,3-Trichlorobenzene	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,2,3-Trichloropropane	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,2,4-Trichlorobenzene	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,2,4-Trimethylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,2-Dichlorobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,2-Dichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,2-Dichloropropane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,3,5-Trimethylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,3-Dichlorobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,3-Dichloropropane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	1,4-Dichlorobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	2,2-Dichloropropane	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	2-Chlorotoluene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	2-Hexanone	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	2-Methoxy-2-methyl-butane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	4-Chlorotoluene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	4-Methyl-2-pentanone [MIBK]	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Acetone	54	ug/L		10	20	J	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Benzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Bromobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Bromodichloromethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Bromoform	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Bromomethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Carbon tetrachloride	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Chlorobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Chlorobromomethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Chloroethane	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Chloroform	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Chloromethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	cis-1,2-Dichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	cis-1,3-Dichloropropene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Cymene [Isopropyltoluene]	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Dibromochloromethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Dibromochloropropane	0.5	ug/L	U	0.5	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Dibromomethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	0.88	ug/L	U	0.88	2	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Diisopropyl ether	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Ethane, 1,2-dibromo-	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Ethyl tert-butyl ether	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Ethylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Freon-11 [Trichlorofluoromethane]	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Freon-12 [Dichlorodifluoromethane]	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Hexachlorobutadiene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Isopropylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	m,p-Xylene	0.5	ug/L	U	0.5	1	UJ	h	Holding Time

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Methyl ethyl ketone [2-Butanone]	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	MTBE [Methyl tert-butyl ether]	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Naphthalene	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	n-Butyl benzene	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	n-Propylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	o-Xylene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	sec-Butylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Styrene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	tert-Butyl alcohol	5	ug/L	U	5	10	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	tert-Butyl benzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Tetrachloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Toluene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	trans-1,2-Dichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	trans-1,3-Dichloropropene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Trichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Vinyl chloride	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	SW-8260B	Total	Xylenes [total]	0.5	ug/L	U	0.5	1	UJ	h	Holding Time
440-214187-1	CTMW-01S-20180621	6/21/2018	VFA	Total	Pyruvic Acid	3.7	mg/L	UF1	3.7	15	UJ	m	MS Recovery
440-214187-1	CTMW-02D-20180621	6/21/2018	EPA 365.3	Total	Phosphorus	0.036	mg/L	J	0.025	0.05	J	sp	Detect < PQL
440-214187-1	CTMW-02D-20180621	6/21/2018	SW-6010B	Total	Iron	0.81	mg/L	J	0.5	1	J	sp	Detect < PQL
440-214187-1	CTMW-02D-20180621	6/21/2018	SW-6010B	Total	Manganese	0.54	mg/L	F1	0.15	0.2	J+	m	MS Recovery
440-214187-1	CTMW-02D-20180621	6/21/2018	SW-6020A	Dissolved	Beryllium	1.4	ug/L	J	1.3	2.5	J	sp	Detect < PQL
440-214187-1	CTMW-02D-20180621	6/21/2018	SW-6020A	Dissolved	Nickel	3.9	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214187-1	CTMW-02D-20180621	6/21/2018	SW-6020A	Dissolved	Selenium	6	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214189-1	CTMW-04D-20180621	6/21/2018	EPA 351.2	Total	Total Kjeldahl Nitrogen [TKN]	0.1	mg/L	UF1	0.1	0.2	R	m	MS Recovery
440-214189-1	CTMW-04D-20180621	6/21/2018	EPA 365.3	Total	Orthophosphate (as P)	0.051	mg/L	F1	0.02	0.05	J-	m	MS Recovery
440-214189-1	CTMW-04D-20180621	6/21/2018	EPA 365.3	Total	Phosphate	0.16	mg/L	F1	0.06	0.15	J-	m	MS Recovery
440-214189-1	CTMW-04D-20180621	6/21/2018	EPA 365.3	Total	Phosphorus	0.025	mg/L	UF1	0.025	0.05	R	m	MS Recovery
440-214189-1	CTMW-04D-20180621	6/21/2018	RSK175	Total	Methane	0.071	mg/L		0.0025	0.00099	J	vh	Head Space
440-214189-1	CTMW-04D-20180621	6/21/2018	SM4500-S2-D	Total	Sulfide	0.027	mg/L	UF1	0.027	0.05	R	m	MS Recovery
440-214189-1	CTMW-04D-20180621	6/21/2018	SM5220D	Total	Chemical Oxygen Demand	20	mg/L	UF1	20	40	R	m	MS Recovery
440-214189-1	CTMW-04D-20180621	6/21/2018	SW-6010B	Total	Iron	0.59	mg/L	F1	0.25	0.5	J-	m	MS Recovery
440-214189-1	CTMW-04D-20180621	6/21/2018	SW-6020A	Dissolved	Copper	2.5	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214189-1	CTMW-04D-20180621	6/21/2018	SW-6020A	Dissolved	Iron	65	ug/L	JB	40	100	J	bl,sp	Lab Blank, Detect < PQL
440-214189-1	CTMW-04D-20180621	6/21/2018	SW-6020A	Dissolved	Nickel	2.6	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214189-1	CTMW-04D-20180621	6/21/2018	SW-6020A	Dissolved	Selenium	5.1	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214189-1	CTMW-04D-20180621	6/21/2018	SW-6020A	Dissolved	Zinc	40	ug/L	JB	13	100	J	bl,sp	Lab Blank, Detect < PQL
440-214189-1	CTMW-04D-20180621	6/21/2018	VFA	Total	Pyruvic Acid	3.7	mg/L	UF1	3.7	15	UJ	m	MS Recovery
440-214189-1	CTMW-04S-20180621	6/21/2018	SW-6010B	Total	Iron	0.087	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-214189-1	CTMW-04S-20180621	6/21/2018	SW-6020A	Dissolved	Aluminum	37	ug/L	JB	25	50	J	bl,sp	Lab Blank, Detect < PQL
440-214189-1	CTMW-04S-20180621	6/21/2018	SW-6020A	Dissolved	Antimony	3	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214189-1	CTMW-04S-20180621	6/21/2018	SW-6020A	Dissolved	Cobalt	3.5	ug/L	J	2.5	5	J	sp	Detect < PQL
440-214189-1	CTMW-04S-20180621	6/21/2018	SW-6020A	Dissolved	Nickel	5.5	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214189-1	CTMW-04S-20180621	6/21/2018	SW-6020A	Dissolved	Selenium	8.1	ug/L	J	2.5	10	J	sp	Detect < PQL
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-6010B	Total	Chromium	3.3	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-6020A	Dissolved	Aluminum	46	ug/L	B	5	10	J+	bl	Lab Blank
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-6020A	Dissolved	Cobalt	0.74	ug/L	J	0.5	1	J	sp	Detect < PQL
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-6020A	Dissolved	Copper	0.63	ug/L	J	0.5	2	J	sp	Detect < PQL
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,1,1,2-Tetrachloroethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,1,1-Trichloroethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,1,2,2-Tetrachloroethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,1,2-Trichloroethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,1-Dichloroethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,1-Dichloroethene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,1-Dichloropropene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,2,3-Trichlorobenzene	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,2,3-Trichloropropane	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,2,4-Trichlorobenzene	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,2,4-Trimethylbenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,2-Dichlorobenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,2-Dichloroethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,2-Dichloropropane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,3,5-Trimethylbenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,3-Dichlorobenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,3-Dichloropropane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	1,4-Dichlorobenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	2,2-Dichloropropane	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	2-Chlorotoluene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	2-Hexanone	13	ug/L	U	13	25	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	2-Methoxy-2-methyl-butane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	4-Chlorotoluene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	4-Methyl-2-pentanone [MIBK]	13	ug/L	U	13	25	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Acetone	50	ug/L	U	50	100	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Benzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Bromobenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Bromodichloromethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Bromoform	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Bromomethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Carbon tetrachloride	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Chlorobenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Chlorobromomethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Chloroethane	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Chloroform	270	ug/L	U	1.3	2.5	J	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Chloromethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	cis-1,2-Dichloroethene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	cis-1,3-Dichloropropene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Cymene [Isopropyltoluene]	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Dibromochloromethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Dibromochloropropane	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Dibromomethane	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	19	ug/L	U	4.4	10	J	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Diisopropyl ether	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Ethane, 1,2-dibromo-	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Ethyl tert-butyl ether	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Ethylbenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Freon-11 [Trichlorofluoromethane]	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Freon-12 [Dichlorodifluoromethane]	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Hexachlorobutadiene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Isopropylbenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	m,p-Xylene	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Methyl ethyl ketone [2-Butanone]	13	ug/L	U	13	25	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	MTBE [Methyl tert-butyl ether]	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Naphthalene	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	n-Butyl benzene	2	ug/L	U	2	5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	n-Propylbenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	o-Xylene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	sec-Butylbenzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Styrene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	tert-Butyl alcohol	25	ug/L	U	25	50	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	tert-Butyl benzene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Tetrachloroethene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Toluene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	trans-1,2-Dichloroethene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	trans-1,3-Dichloropropene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Trichloroethene	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Vinyl chloride	1.3	ug/L	U	1.3	2.5	UJ	h	Holding Time
440-214285-1	CTMW-06D-20180622	6/22/2018	SW-8260B	Total	Xylenes [total]	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-6010B	Total	Chromium	0.042	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-6020A	Dissolved	Aluminum	27	ug/L	B	5	10	J+	bl	Lab Blank
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-6020A	Dissolved	Antimony	1.3	ug/L	J	0.5	2	J	sp	Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-6020A	Dissolved	Cadmium	0.25	ug/L	J	0.25	1	J	sp	Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-6020A	Dissolved	Copper	0.75	ug/L	J	0.5	2	J	sp	Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-6020A	Dissolved	Selenium	0.59	ug/L	JF1	0.5	2	J	m_sp	MS Recovery, Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,1,1,2-Tetrachloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,1,1-Trichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,1,2,2-Tetrachloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,1,2-Trichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,1-Dichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,1-Dichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,1-Dichloropropene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,2,3-Trichlorobenzene	0.49	ug/L	J	0.4	1	J	h.sp	Holding Time, Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,2,3-Trichloropropane	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,2,4-Trichlorobenzene	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,2,4-Trimethylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,2-Dichlorobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,2-Dichloroethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,2-Dichloropropane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,3,5-Trimethylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,3-Dichlorobenzene	0.33	ug/L	J	0.25	0.5	J	h.sp	Holding Time, Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,3-Dichloropropane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	1,4-Dichlorobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	2,2-Dichloropropane	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	2-Chlorotoluene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	2-Hexanone	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	2-Methoxy-2-methyl-butane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	4-Chlorotoluene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	4-Methyl-2-pentanone [MIBK]	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Acetone	12	ug/L	J	10	20	J	h.sp	Holding Time, Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Benzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Bromobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Bromodichloromethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Bromoform	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Bromomethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Carbon tetrachloride	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Chlorobenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Chlorobromomethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Chloroethane	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Chloroform	4.9	ug/L	U	0.25	0.5	J	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Chloromethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	cis-1,2-Dichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	cis-1,3-Dichloropropene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Cymene [Isopropyltoluene]	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Dibromochloromethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Dibromochloropropane	0.5	ug/L	U	0.5	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Dibromomethane	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	1.4	ug/L	J	0.88	2	J	h.sp	Holding Time, Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Diisopropyl ether	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Ethane, 1,2-dibromo-	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Ethyl tert-butyl ether	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Ethylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Freon-11 [Trichlorofluoromethane]	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Freon-12 [Dichlorodifluoromethane]	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Hexachlorobutadiene	0.3	ug/L	J	0.25	0.5	J	h.sp	Holding Time, Detect < PQL
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Isopropylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	m,p-Xylene	0.5	ug/L	U	0.5	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Methyl ethyl ketone [2-Butanone]	2.5	ug/L	U	2.5	5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	MTBE [Methyl tert-butyl ether]	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Naphthalene	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	n-Butyl benzene	0.4	ug/L	U	0.4	1	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	n-Propylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	o-Xylene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	sec-Butylbenzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Styrene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	tert-Butyl alcohol	5	ug/L	U	5	10	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	tert-Butyl benzene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Tetrachloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Toluene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	trans-1,2-Dichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	trans-1,3-Dichloropropene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time

Table 6 Results Qualified During Validation

SDG	Sample ID	Sample Date	Method	Total or Dissolved	Analyte	Result	Units	Lab Qualifier	SQL	PQL	Validator Qualifier	Reason Code	Reason Code Definition
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Trichloroethene	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Vinyl chloride	0.25	ug/L	U	0.25	0.5	UJ	h	Holding Time
440-214285-1	CTMW-06S-20180622	6/22/2018	SW-8260B	Total	Xylenes [total]	0.5	ug/L	U	0.5	1	UJ	h	Holding Time
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-6010B	Total	Chromium	0.018	mg/L	B	0.0025	0.005	J+	bl	Lab Blank
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-6010B	Total	Iron	0.075	mg/L	J	0.05	0.1	J	sp	Detect < PQL
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-6010B	Total	Manganese	0.015	mg/L	J	0.015	0.02	J	sp	Detect < PQL
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-6020A	Dissolved	Aluminum	62	ug/L	B	5	10	J+	bl	Lab Blank
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-6020A	Dissolved	Selenium	1.3	ug/L	J	0.5	2	J	sp	Detect < PQL
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-8260B	Total	2,2-Dichloropropane	0.4	ug/L	U	0.4	1	UJ	c	Calibration
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-8260B	Total	Chloroform	0.41	ug/L	J	0.25	0.5	J	sp	Detect < PQL
440-214285-1	CTMW-07D-20180622	6/22/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	0.97	ug/L	J	0.88	2	J	sp	Detect < PQL
440-214285-1	M12-20180622-TB	6/22/2018	SW-8260B	Total	2,2-Dichloropropane	0.4	ug/L	U	0.4	1	UJ	c	Calibration
440-214285-1	M12-20180622-TB	6/22/2018	SW-8260B	Total	Dichloromethane [Methylene chloride]	1	ug/L	J	0.88	2	J	sp	Detect < PQL
440-214285-1	M12-20180622-TB	6/22/2018	SW-8260B	Total	Tetrachloroethene	0.38	ug/L	J	0.25	0.5	J	sp	Detect < PQL

Table 7 Field Duplicate Exceedances

SDG	Method	Parameter	Filtered	Units	Parent Sample ID	Result	FD Result	RPD (%)	Allowed RPD (%)	Difference >PQL
440-204893-1	EPA 365.3	Orthophosphate (as P)	Total	mg/L	CTMW-01D-20180305	0.072	0.17	---	N/A	0.098
440-204893-1	EPA 365.3	Phosphate	Total	mg/L	CTMW-01D-20180305	0.22	0.51	---	N/A	0.29
440-214187-1	EPA 365.3	Phosphate	Total	mg/L	CTMW-01D-20180621	0.65	0.48	---	N/A	0.17
440-214187-1	SM5220D	Chemical Oxygen Demand	Total	mg/L	CTMW-01D-20180621	870	650	---	N/A	220
440-214187-1	SW-8260B	Methyl ethyl ketone [2-Butanone]	Total	ug/L	CTMW-01D-20180621	940	1300	32	30	---

Table 8 MS/MSD Recovery Exceedances

SDG	Spiked Sample	Lab Sample ID	Method	Filtered	Parameter	MS Recovery (%)	MSD Recovery (%)	Acceptance Range (%)
440-192727-1	CTMW-07D-80.0-20170921	440-192727-6	EPA 314.0	N	Perchlorate	86	67	80 - 120
440-204893-1	CTMW-01D-20180305	440-204893-3	EPA 365.3	N	Orthophosphate (as P)	33	30	75 - 125
440-204893-1	CTMW-01D-20180305	440-204893-3	EPA 365.3	N	Phosphate	33	30	75 - 125
440-204893-1	CTMW-07S-20180306	440-204893-9	EPA 314.0	N	Perchlorate	57	59	80 - 120
440-204893-1	CTMW-07S-20180306	440-204893-9	EPA 351.2	N	Total Kjeldahl Nitrogen [TKN]	0	0	90 - 110
440-204893-1	CTMW-07S-20180306	440-204893-9	EPA 365.3	N	Orthophosphate (as P)	24	25	75 - 125
440-204893-1	CTMW-07S-20180306	440-204893-9	EPA 365.3	N	Phosphate	24	25	75 - 125
440-204893-1	CTMW-07S-20180306	440-204893-9	EPA 365.3	N	Phosphorus	24	20	75 - 125
440-204893-1	CTMW-07S-20180306	440-204893-9	SM4500-S2-D	N	Sulfide	14	14	70 - 130
440-204893-1	CTMW-07S-20180306	440-204893-9	SW-6010B	N	Iron	155	148	75 - 125
440-204893-1	CTMW-07S-20180306	440-204893-9	SW-6020A	Y	Silver	59	53	75 - 125
440-204893-1	CTMW-07S-20180306	440-204893-9	SW-6020A	Y	Zinc	62	62	75 - 125
440-204893-1	CTMW-07S-20180306	440-204893-9	VFA-IC	N	Pyruvic Acid	73	67	80 - 120
440-205188-1	CTMW-04S-20180307	440-205188-3	SW-6020A	Y	Copper	70	77	75 - 125
440-205188-1	CTMW-04S-20180307	440-205188-3	SW-6020A	Y	Lead	69	69	75 - 125
440-205188-1	CTMW-04S-20180307	440-205188-3	SW-6020A	Y	Nickel	72	77	75 - 125
440-205188-1	CTMW-04S-20180307	440-205188-3	SW-6020A	Y	Zinc	73	76	75 - 125
440-205188-1	CTMW-06D-20180307	440-205188-2	SW-8260B	N	Chloroform	92	54	70 - 130
440-205188-2	CTMW-04D-20180307	440-205188-4	EPA 365.3	N	Orthophosphate (as P)	29	28	75 - 125
440-205188-2	CTMW-04D-20180307	440-205188-4	EPA 365.3	N	Phosphate	29	28	75 - 125
440-214187-1	CTMW-01S-20180621	440-214187-1	VFA-IC	N	Pyruvic Acid	76	Not analyzed	80 - 120
440-214187-1	CTMW-02D-20180621	440-214187-4	SW-6010B	N	Manganese	112	128	75 - 125
440-214189-1	CTMW-04D-20180621	440-214189-2	EPA 351.2	N	Total Kjeldahl Nitrogen [TKN]	0	0	90 - 110
440-214189-1	CTMW-04D-20180621	440-214189-2	EPA 365.3	N	Orthophosphate (as P)	24	21	75 - 125
440-214189-1	CTMW-04D-20180621	440-214189-2	EPA 365.3	N	Phosphate	24	21	75 - 125
440-214189-1	CTMW-04D-20180621	440-214189-2	EPA 365.3	N	Phosphorus	18	20	75 - 125
440-214189-1	CTMW-04D-20180621	440-214189-2	SM4500-S2-D	N	Sulfide	28	28	70 - 130
440-214189-1	CTMW-04D-20180621	440-214189-2	SM5220D	N	Chemical Oxygen Demand	0	0	70 - 120
440-214189-1	CTMW-04D-20180621	440-214189-2	SW-6010B	N	Iron	61	70	75 - 125
440-214189-1	CTMW-04D-20180621	440-214189-2	VFA-IC	N	Pyruvic Acid	63	63	80 - 120
440-214285-1	CTMW-06S-20180622	440-214285-2	SW-6020A	Y	Selenium	75	74	75 - 125

Table 9 Sample Condition and Preservation Infractions

SDG	Sample ID	Method	Parameter	Outlier	Limit
440-204893-1	CTMW-01S-20180305	SM5310B	Total Organic Carbon	pH > 2	pH < 2
440-204893-1	CTMW-02S-20180306	SM5310B	Total Organic Carbon	pH > 2	pH < 2
440-214187-1	CTMW-01S-20180621	RSK175	Methane	Headspace	No Headspace
440-214189-1	CTMW-04D-20180621	RSK175	Methane	Headspace	No Headspace

Table 10 Holding Time Exceedances

SDG	Sample ID	Method	Filtered	Parameter	Time Limit	Time Elapsed
440-192727-1	CTMW-07D-50.0-20170921	SW-8260B	Total	Chloroform	7 days	11.2 days
440-192727-1	CTMW-07D-70.0-20170921-GW	SW-8260B	Total	Chloroform	7 days	11.2 days
440-204893-1	CTMW-01S-20180305	RSK175	Total	Methane	7 days	10.1 days
440-204893-1	CTMW-01S-20180305	SM5310B	Total	Total Organic Carbon	4 hours	355.2 hours
440-204893-1	CTMW-02S-20180306	RSK175	Total	Methane	7 days	8.9 days
440-204893-1	CTMW-02S-20180306	SM5310B	Total	Total Organic Carbon	4 hours	314.4 hours
440-204893-1	CTMW-06S-20180306	RSK175	Total	Methane	7 days	9.1 days
440-214187-1	CTMW-01D-20180621-FD	SW-8260B	Total	VOCs	7 days	10.3 days
440-214187-1	CTMW-01S-20180621	SW-8260B	Total	VOCs	7 days	10.2 days
440-214285-1	CTMW-06D-20180622	SW-8260B	Total	VOCs	7 days	11.4 days
440-214285-1	CTMW-06S-20180622	SW-8260B	Total	VOCs	7 days	11.5 days

Table 11 Laboratory Blank Detections

SDG	Sample ID	Method	Parameter	Result	Units	Associated Samples with Qualification
440-193864-1	CCB 440-435352/16	SW-6020A	Iron	8.29	ug/L	CTMW-07D-20171009
440-204893-1	MB 440-463023/1-A	SW-6010B	Iron	0.0574	mg/L	CTMW-07D-20180306, CTMW-07S-20180306
440-205188-1	MB 440-463327/1-G	SW-6020A	Aluminum	7.31	ug/L	CTMW-04S-20180307, CTMW-06D-20180307
440-205188-2	MB 440-463327/1-G	SW-6020A	Aluminum	7.31	ug/L	CTMW-04D-20180307
440-214189-1	MB 440-484150/1-B	SW-6020A	Iron	9.08	ug/L	CTMW-04D-20180621
440-214189-1	MB 440-484150/1-F	SW-6020A	Zinc	3.61	ug/L	CTMW-04D-20180621
440-214189-1	MB 440-484625/1-F	SW-6020A	Aluminum	7.84	ug/L	CTMW-04S-20180621
440-214285-1	MB 440-484831/1-E	SW-6020A	Aluminum	7.2	ug/L	CTMW-06D-20180622, CTMW-06S-20180622, CTMW-07D-20180622
440-214285-1	MB 440-485831/1-A	SW-6010B	Chromium	0.0044	mg/L	CTMW-06D-20180622, CTMW-06S-20180622, CTMW-07D-20180622

Table 12 Completeness Summary

Method	Total Number of Validated Results	Number of Rejected Results	Percent Completeness
EPA 300.0	63	0	100.0%
EPA 300.1B	55	0	100.0%
EPA 314.0	34	0	100.0%
EPA 351.2	21	2	90.5%
EPA 365.3	63	2	96.8%
RSK175	21	0	100.0%
SM2320B	84	0	100.0%
SM2340C	21	0	100.0%
SM2540C	21	0	100.0%
SM4500-S2-D	21	2	90.5%
SM5220D	10	1	90.0%
SM5310B	21	0	100.0%
SW-6010B	76	0	100.0%
SW-6020A	399	0	100.0%
SW-7199	34	0	100.0%
SW-8260B	1878	0	100.0%
VFA-IC	126	0	100.0%

Appendix E.1

Validation Checklists

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 11

SDG/Report No.: 440-192727-1
 Lab ID: Test America
 Matrix: Soil/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	CTMW-07D-50.0-20170921 and CTMW-07D-70.0-20170921: Qualify chloroform "J".
4. Instrument Performance		X	No	None
5. Initial Calibration		X	No	None
6. Continuing Calibration Verification		X	No	None
7. Blanks		X	No	None
8. Surrogates/Monitoring Compounds	X		No	None
9. Matrix Spike/Matrix Spike Duplicate/MSI	X		Yes	CTMW-07D-80.0-20170921: Qualify perchlorate "J-".
10. Serial Dilution		X	No	None
11. Laboratory Control Samples		X	No	None
12. Interference Check Samples		X	No	None
13. Internal Standards		X	No	None
14. Duplicates		X	No	None
15. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results detected between the MDL and RL "J".
16. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label	Soil: Stage_2B_Validation_Manual Water: Stage_2A_Validation_Manual			
Verification and Validation Label Code	Soil: S2BVM Water: S2AVM			
Overall Assessment: Results are acceptable as qualified.				
Usability: Qualified sample results (J, J-) are considered useable for limited purposes. Other sample 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)	Validation Stage
CTMW-07D-50.0-20170921	440-192727-1	9/21/2017	1.5 °C/4.0 °C	Stage 2A
CTMW-07D-60.0-20170921	440-192727-2	9/21/2017	1.5 °C/4.0 °C	Stage 2B
CTMW-07D-70.0-20170921-GW	440-192727-3	9/21/2017	1.5 °C/4.0 °C	Stage 2A
CTMW-07D-70.0-20170921-SO	440-192727-4	9/21/2017	1.5 °C/4.0 °C	Stage 2B
Trip Blank	440-192727-5	9/21/2017	1.5 °C/4.0 °C	Stage 2A
CTMW-07D-80.0-20170921	440-192727-6	9/21/2017	1.5 °C/4.0 °C	Stage 2B
CTMW-07D-90.0-20170921	440-192727-7	9/21/2017	1.5 °C/4.0 °C	Stage 2B
CTMW-07D-100.0-20170921	440-192727-8	9/21/2017	1.5 °C/4.0 °C	Stage 2B
CTMW-07D-110.0-20170921	440-192727-9	9/21/2017	1.5 °C/4.0 °C	Stage 2B
CTMW-07.D-60.0-20170921-EB	440-192727-10	9/21/2017	1.5 °C/4.0 °C	Stage 2A
CTMW-07D-90.0-20170921-FD	440-192727-11	9/21/2017	1.5 °C/4.0 °C	Stage 2B

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 4°C (+ or – 2°C)? Were samples received in proper condition?	No/No/Yes
8260B: The following samples were collected in bottles with preservative added but were not preserved to pH<2: CTMW-07D-50.0-20170921 and CTMW-07D-70.0-20170921-GW. The method allows unpreserved samples.	

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
8260B: The following samples were analyzed after the 7-day turn-around-time for unpreserved samples: CTMW-07D-50.0-20170921 and CTMW-07D-70.0-20170921-GW.	

4. Instrument Performance	
Was BFB analyzed before and within 12 hours of sample analysis? Were mass assignments correct and normalized to m/z 95? Were ion abundance criteria met?	Yes/Yes/Yes

5. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ method or national functional guideline (NFG) requirements or Coefficient of Correlation or Coefficient of Determination ≥ method or NFG requirements? Were Relative Response Factors (RRFs) and average RRFs ≥ method or NFG requirements?	Yes/Yes/Yes

Data Verification and Validation Summary

6. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) \leq method or NFG requirements? Did RRFs and average RRFs meet method or NFG requirements?	Yes/Yes/Yes/Yes

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

8. Surrogates/Monitoring Compounds	
Were samples spiked with the correct surrogate compounds? Were surrogate recoveries reported on data forms? Were recoveries within laboratory limits?	Yes/Yes/No
8260B: 4-Bromofluorobenzene recovery was high in CTMW-07D-90.0-20170921-FD. Chloroform was not detected, so there can be no high bias.	

9. Matrix Spike/Matrix Spike Duplicate/MSI	
Was a MS/MSD pair or MSI extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	Yes/Yes/No
Qualifiers, if applicable, were applied to parent samples and their FDs only.	
314.0: Perchlorate recovery was low in the MSD of CTMW-07D-80.0-20170921.	
6010B: Total chromium recoveries were outside limits in the MS/MSD of CTMW-07D-50.0-20170921. The concentrations in the parent sample were $> 4x$ the amount spiked. No qualification is needed.	

10. Serial Dilution	
Were serial dilutions analyzed at appropriate intervals? For results $> 50x$ the MDL, were %Ds within acceptable limits of the true value?	Yes/N/A

11. 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

12. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/Yes

13. Internal Standards (IS)	
Were ISs added to each sample in the run including calibrations, samples, and QC samples? Were area counts of the ISs for all samples within 50% and 200% of its response in the CCV? Was the Retention Time of the IS within ± 30 seconds from the RT of the IS in the associated CCV or mid-point standard from ICAL?	Yes/Yes/Yes

Data Verification and Validation Summary

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates \leq lab limits or \leq 30% (water) or 50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/Yes
15. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) adjusted to reflect dilutions, cleanup, and other factors? If applicable, were reporting limit check recoveries within acceptable limits?	Yes/Yes
16. 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 10/15/2018

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 3

SDG/Report No.: 440-192817-1
 Lab ID: Test America
 Matrix: Soil/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. Instrument Performance		X	No	None
5. Initial Calibration		X	No	None
6. Continuing Calibration Verification		X	No	None
7. Blanks	X		No	None
8. Surrogates/Monitoring Compounds		X	No	None
9. Matrix Spike/Matrix Spike Duplicate/MSI		X	No	None
10. Serial Dilution		X	No	None
11. Laboratory Control Samples		X	No	None
12. Interference Check Samples		X	No	None
13. Internal Standards		X	No	None
14. Duplicates		X	No	None
15. Compound Quantitation and Reporting Limits		X	Yes	Qualify all results detected between the MDL and RL "J".
16. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label	Soil: Stage_2B_Validation_Manual Water: Stage_2A_Validation_Manual			
Verification and Validation Label Code	Soil: S2BVM Water: S2AVM			
Overall Assessment: Results are acceptable as qualified.				
Usability: Qualified sample results (J) are considered useable for limited purposes. Other sample results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)	Validation Stage
CTMW-07D-120.0-20170922	440-192817-1	9/22/2017	1.9 °C/4.1 °C	Stage 2B
CTMW-07D-130.0-20170922-EB	440-192817-2	9/22/2017	1.9 °C/4.1 °C	Stage 2A
Trip Blank	440-192817-3	9/22/2017	1.9 °C/4.1 °C	Stage 2A

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 4°C (+ or – 2°C)? Were samples received in proper condition?	Yes/No/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
CTMW-07D-130.0-20170922-EB did not have a sample time on the COC. Sample time was on the labels	

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

4. Instrument Performance	
Was BFB analyzed before and within 12 hours of sample analysis? Were mass assignments correct and normalized to m/z 95? Were ion abundance criteria met?	Yes/Yes/Yes

5. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ method or national functional guideline (NFG) requirements or Coefficient of Correlation or Coefficient of Determination ≥ method or NFG requirements? Were Relative Response Factors (RRFs) and average RRFs ≥ method or NFG requirements?	Yes/Yes/Yes

6. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method or NFG requirements? Did RRFs and average RRFs meet method or NFG requirements?	Yes/Yes/Yes/Yes

7. Blanks	
Does data package include a summary of blank results? Was a method blank extracted and/or analyzed for each batch? Were calibration blanks analyzed at appropriate intervals? Were analytes detected in any blanks?	Yes/Yes/Yes/Yes
314.0: Perchlorate was detected in CTMW-07D-130.0-20170922-EB. It was not detected in the sample.	

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

Data Verification and Validation Summary

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

10. Serial Dilution	
Were serial dilutions analyzed at appropriate intervals? For results > 50x the MDL, were %Ds within acceptable limits of the true value?	Yes/N/A

11. 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

12. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/Yes

13. Internal Standards (IS)	
Were ISs added to each sample in the run including calibrations, samples, and QC samples? Were area counts of the ISs for all samples within 50% and 200% of its response in the CCV? Was the Retention Time of the IS within ± 30 seconds from the RT of the IS in the associated CCV or mid-point standard from ICAL?	Yes/Yes/Yes

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

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

16. 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 10/15/2018

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 1

SDG/Report No.: 440-192835-1
 Lab ID: Test America
 Matrix: Soil

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. Instrument Performance		X	No	None
5. Initial Calibration		X	No	None
6. Continuing Calibration Verification		X	No	None
7. Blanks		X	No	None
8. Surrogates/Monitoring Compounds		X	No	None
9. Matrix Spike/Matrix Spike Duplicate/MSI		X	No	None
10. Serial Dilution		X	No	None
11. Laboratory Control Samples		X	No	None
12. Interference Check Samples		X	No	None
13. Internal Standards		X	No	None
14. Duplicates		X	No	None
15. Compound Quantitation and Reporting Limits		X	No	None
16. Calculations and Raw Data		X	No	None
17. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label	Stage_4_Validation_Manual			
Verification and Validation Label Code	S4VM			
Overall Assessment: Acceptable as reported.				
Usability: Sample results are considered valid and useable for all purposes.				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
CTMW-07D-120.0-20170922	440-192835-1	9/22/2017	1.9 °C/4.1 °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 4°C (+ or – 2°C)? Were samples received in proper condition?	Yes/No/Yes

2. Chain-of-Custody (COC)	
Were samples recorded on the COCs? Were correct analyses performed on the samples?	Yes/Yes
The client requested that Manganese be added to all samples.	

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

4. Instrument Performance	
Was BFB analyzed before and within 12 hours of sample analysis? Were mass assignments correct and normalized to m/z 95? Were ion abundance criteria met?	Yes/Yes/Yes

5. Initial Calibration (ICAL)	
Were the correct number of standards analyzed to establish the calibration curve for each analyte? Were Percent Relative Standard Deviations (%RSDs) of the Response Factors (RFs) ≤ method or national functional guideline (NFG) requirements or Coefficient of Correlation or Coefficient of Determination ≥ method or NFG requirements? Were Relative Response Factors (RRFs) and average RRFs ≥ method or NFG requirements?	Yes/Yes/Yes

6. Continuing Calibration Verification (CCV)	
Were CCVs analyzed at the beginning and end of sample analysis, if applicable? Were calibrations compared to the correct initial calibrations? Were Percent Differences (%D) ≤ method or NFG requirements? Did RRFs and average RRFs meet method or NFG requirements?	Yes/Yes/Yes/Yes

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

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

9. Matrix Spike/Matrix Spike Duplicate/MSI	
Was a MS/MSD pair or MSI extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs of project samples within laboratory established limits?	Yes/Yes/No
Outlier was from a sample in another data package.	

Data Verification and Validation Summary

10. Serial Dilution	
Were serial dilutions analyzed at appropriate intervals? For results > 50x the MDL, were %Ds within acceptable limits of the true value?	Yes/N/A

11. 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

12. Interference Check Sample (ICS)	
Were interference check samples (ICS) analyzed at appropriate intervals? Were ICS recoveries within acceptable limits of the true value? Were ICSA samples non-detect for analytes not in the solution?	Yes/Yes/Yes

13. Internal Standards (IS)	
Were ISs added to each sample in the run including calibrations, samples, and QC samples? Were area counts of the ISs for all samples within 50% and 200% of its response in the CCV? Was the Retention Time of the IS within ± 30 seconds from the RT of the IS in the associated CCV or mid-point standard from ICAL?	Yes/Yes/Yes

14. Duplicates	
Were any duplicate pairs analyzed in this SDG? For results > 5x the RL, were RPDs between parent sample and duplicates \leq lab limits or $\leq 30\%$ for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/No/N/A

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

16. Calculations and Raw Data	
Did calculated results and raw data match the reported data?	Yes
Slight differences due to rounding.	

17. 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 10/15/18

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Project No.: M12
 No. of Samples: 2

SDG/Report No.: 440-193864-1
 Lab ID: Test America – Irvine/Buffalo
 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	CTMW-07D-20171009: Qualify dissolved iron "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 and RL "J".
10. Data Package/EDD comparison (10%)		X	No	None
11. Other - Calibration	X		Yes	CTMW-07D-20171009: Qualify 1,1,2-Trichloroethane "UJ".

Verification and Validation Label	Stage_2A_Validation_Manual
Verification and Validation Label Code	S2AVM

Overall Assessment: Acceptable as qualified.
Usability: Sample results qualified as estimated are useable for limited purposes only. All other results are considered valid and useable for all purposes.
 CCBs and calibrations are not reviewed in 2A, but items were noticed by validator.

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperature(s)
Trip Blank	440-193864-1	10/9/2017	2.3 °C, 2.3 °C, 2.9 °C
CTMW-07D-20171009	440-193864-2	10/9/2017	2.3 °C, 2.3 °C, 2.9 °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 4°C (+ or – 2°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
6020: Iron was detected in calibration blank CCB 440-435352/16 (8.29 ug/L).	

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/MSI	
Was a MS/MSD pair or MSI extracted and/or analyzed with each batch? Were recoveries/RPDs reported correctly on data forms? Were recoveries/RPDs within laboratory established limits?	No/Yes/No
6010B: Iron recoveries were high in the MS/MSD of CTMW-07D-2017100. 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/No

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% for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
Notes: Lab analyzed duplicates from other work orders for general chemistry parameters.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) 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 - Calibration	
8260B: ICAL 17676: 1,1,2-Trichloroethane RRF = 0.1809. NFG requires ≥ 0.200. CCVIS 440-435536/2: 1,1,2-Trichloroethane RRF = 0.1899. NFG requires ≥ 0.200	

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 10

SDG/Report No.: 440-204893-1
 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		Yes	CTMW-01S-20180305 and CTMW-02S-20180306: Qualify TOC "J-".
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	CTMW-01S-20180305, CTMW-02S-20180306, and CTMW-06S-20180306: Qualify methane "J-". CTMW-01S-20180305 and CTMW-02S-20180306: Qualify TOC "J-".
4. Blanks	X		Yes	CTMW-07S-20180306 and CTMW-07D-20180306: Qualify iron "J", and "J+", respectively.
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	CTMW-07S-20180306: Qualify perchlorate, orthophosphorus as PO4, and dissolved silver "J-"; orthophosphate as P, total iron, and dissolved zinc "J"; sulfide, total phosphorus, and TKN "R"; and pyruvic acid "UJ". CTMW-01D-20180305, CTMW-01D-20180305-FD: Qualify orthophosphate as P and orthophosphorus as PO4 "J".
7. Laboratory Control Samples		X	No	None
8. Duplicates	X		Yes	CTMW-01D-20180305, CTMW-01D-20180305-FD: Qualify orthophosphate as P and orthophosphorus as PO4 "J".
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify results between the MDL and RL "J".
10. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label		Stage_2A_Validation_Manual		
Verification and Validation Label Code		S2AVM		
<p>Overall Assessment: Results are acceptable as qualified, except for rejected results. Usability: Rejected results are not useable. Qualified sample results (UJ, J-, J, J+) are considered useable for limited purposes. Other sample results are considered valid and useable for all purposes.</p>				

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperatures
Trip Blank	440-204893-1	3/5/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-01S-20180305	440-204893-2	3/5/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-01D-20180305	440-204893-3	3/5/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-01D-20180305-FD	440-204893-4	3/5/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-02D-20180305	440-204893-5	3/5/2018	2.3 °C/4.0 °C/4.5 °C
Trip Blank	440-204893-6	3/6/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-02S-20180306	440-204893-7	3/6/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-07D-20180306	440-204893-8	3/6/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-07S-20180306	440-204893-9	3/6/2018	2.3 °C/4.0 °C/4.5 °C
CTMW-06S-20180306	440-204893-10	3/6/2018	2.3 °C/4.0 °C/4.5 °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 4°C (+ or – 2°C)? Were samples received in proper condition?	No/Yes/Yes
8260B, RSK-175: The following samples were collected in bottles with preservative added, but were not preserved to pH<2: CTMW-01S-20180305, CTMW-02S-20180306, and CTMW-06S-20180306. Both methods allow unpreserved samples.	
SM5310B: The following samples were not preserved to pH<2: CTMW-01S-20180305, CTMW-02S-20180306. They were adjusted 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: The following samples were analyzed after the 7-day turn-around-time for unpreserved samples: CTMW-01S-20180305, CTMW-02S-20180306, and CTMW-06S-20180306.	

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: Iron was detected in MB 440-463023/1-A.	
SM2320B: Alkalinity and bicarbonate alkalinity were detected in MB 440-463386/2. The concentrations in the associated samples were >10x the amount in the blank or ND. No qualification 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

Data Verification and Validation Summary

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: Chloride recoveries were high in the MS/MSD of CTMW-01S-20180305. The concentration in the parent sample was > 4x the amount spiked. No qualification is needed.	
300.1B: Chlorate recoveries were high in the MS/MSD of CTMW-07S-20180306. The concentration in the parent sample was > 4x the amount spiked. Chlorite was not recovered in the MS/MSD of CTMW-07S-20180306 because of dilution. No qualification is needed for either.	
314.0: Perchlorate recoveries were low in the MS/MSD of CTMW-07S-20180306.	
351.2: Total Kjeldahl Nitrogen was not recovered in the MS/MSD of CTMW-07S-20180306. Per inorganic NFG, the data point is rejected.	
365.3: Orthophosphate as P and Orthophosphorus as PO ₄ were low in the MS/MSDs of CTMW-01D-20180305 and CTMW-07S-20180306. Total phosphorus was low in the MS/MSD of CTMW-07S-20180306.	
SM4500-D: Sulfide recoveries were low in the MS/MSD of CTMW-07S-20180306.	
6010B: CTMW-07S-20180306: Total and dissolved chromium recoveries were high in the MS/MSD. The concentrations in the parent sample were > 4x the amount spiked. No qualification is needed. Total iron recoveries were high. Dissolved silver and zinc were low in the MS/MSD. Dissolved aluminum was high in the MSD, but was ND in the parent.	
SW7199: Hexavalent chromium recovery was high in the MS of CTMW-07S-20180306. The concentration in the parent sample was > 4x the amount spiked. No qualification is needed.	
VFA-IC: Pyruvic acid recoveries were low in the MS/MSD of CTMW-07S-20180306. Propionic recovery was high in the MS, but it was ND in the parent.	

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/No
365.3: Orthophosphate as P and Orthophosphorus as PO ₄ were detected in CTMW-01D-20180305 and CTMW-01D-20180305-FD at concentrations <5X the RL. The differences between the parent and FD were > the RL.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) 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 05/14/18

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 4

SDG/Report No.: 440-205188-1/2
 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	CTMW-06D-20180307 and CTMW-04S-20180307: Qualify aluminum "J+". CTMW-04D-20180307: Qualify aluminum "J".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	CTMW-06D-20180307: Qualify chloroform "J". CTMW-04S-20180307: Qualify the following dissolved metals: copper and zinc "J"; lead "UJ", nickel "J-". CTMW-04D-20180307: Qualify orthophosphate as P and orthophosphorus as PO4 "J".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify results between the MDL and RL "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: Results are acceptable as qualified.				
Usability: Qualified sample results are considered useable for limited purposes. Other sample 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 Temperatures
Trip Blank	440-205188-1	3/7/2018	2.6 °C/3.9 °C/4.1 °C
CTMW-06D-20180307	440-205188-2	3/7/2018	2.6 °C/3.9 °C/4.1 °C
CTMW-04S-20180307	440-205188-3	3/7/2018	2.6 °C/3.9 °C/4.1 °C
CTMW-04D-20180307	440-205188-4	3/7/2018	2.6 °C/3.9 °C/4.1 °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 4°C (+ or – 2°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
6020: Aluminum was detected in MB 440-463327/1-G.	

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
365.3: Orthophosphate as P and Orthophosphorus as PO ₄ were low in the MS/MSD of CTMW-04D-20180307.	
6010B: CTMW-04S-20180307: Total and dissolved chromium recoveries were outside limits in the MS and/or MSD. The concentrations in the parent sample were > 4x the amount spiked. No qualification is needed. Dissolved copper, lead, nickel, and zinc were low in the MS and/or MSD.	
6020: Dissolved copper, lead, nickel, and zinc were low in the MS and/or MSD of CTMW-04S-20180307.	
8260B: Chloroform recovery was low in the MSD of CTMW-06D-20180307.	

Data Verification and Validation Summary

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 \leq lab limits or \leq 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/Yes/N/A
9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) 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 05/15/18

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 4

SDG/Report No.: 440-214187-1
 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		Yes	CTMW-01S-20180621: Qualify methane "J".
2. Chain-of-Custody		X	No	None
3. Holding Times	X		Yes	CTMW-01S-20180621 and CTMW-01D-20180621-FD: Qualify VOC detects "J" and non-detects "UJ".
4. Blanks	X		No	None
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	CTMW-02D-20180621: Qualify total manganese "J+". CTMW-01S-20180621: Qualify pyruvic acid "UJ".
7. Laboratory Control Samples		X	No	None
8. Duplicates	X		Yes	CTMW-01D-20180621, CTMW-01D-20180621-FD: Qualify 2-butanone, chemical oxygen demand, and orthophosphorus as PO4 "J".
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify results between the MDL and RL "J".
10. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label		Stage_2A_Validation_Manual		
Verification and Validation Label Code		S2AVM		
<p>Overall Assessment: Results are acceptable as qualified. Usability: Qualified sample results (UJ, J, J+) are considered useable for limited purposes. Other sample results are considered valid and useable for all purposes.</p>				

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperatures
CTMW-01S-20180621	440-214187-1	6/21/2018	1.7 °C/1.9 °C/4.2 °C
CTMW-01D-20180621	440-214187-2	6/21/2018	1.7 °C/1.9 °C/4.2 °C
CTMW-01D-20180621-FD	440-214187-3	6/21/2018	1.7 °C/1.9 °C/4.2 °C
CTMW-02D--20180621	440-214187-4	6/21/2018	1.7 °C/1.9 °C/4.2 °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 4°C (+ or – 2°C)? Were samples received in proper condition?	No/No/No
8260B: The following samples were collected in bottles with preservative added, but were not preserved to pH<2: CTMW-01S-20180621 and CTMW-01D-20180621-FD. The method allows unpreserved samples.	
RSK-175: The following samples were collected in bottles with preservative added, but were not preserved to pH<2: CTMW-01S-20180621, CTMW-01D-20180621, and CTMW-01D-20180621-FD. CTMW-01S-20180621 was received and analyzed with headspace.	

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
8260B: The following samples were analyzed after the 7-day turn-around-time for unpreserved samples: CTMW-01S-20180621 and CTMW-01D-20180621-FD.	

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: Total chromium was detected in MB 440-485027/1-A and MB 440-485208/1-A. The concentrations in the associated samples were >10x the amount in the blank. No qualification needed.	
6020: Aluminum was detected in MB 440-484391/1-D and MB 440-484625/1-E. It was not detected in the samples.	
SM2320B: Alkalinity and bicarbonate alkalinity were detected in MB 440-484918/2. The concentrations in the associated samples were >10x the amount in the blank. No qualification 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: Total chromium and manganese recoveries were high in the MSD of CTMW-02D-20180621. The chromium concentration in the parent sample was > 4x the amount spiked, so recovery criteria do not apply.	
6020: Dissolved aluminum, chromium, and manganese recoveries were outside limits in the MS and/or MSD of CTMW-01D-20180621-FD. The concentrations in the parent sample were > 4x the amount spiked for chromium and manganese. Aluminum recovery was high but the sample was ND, so there can be no high bias. Dissolved barium, chromium, and manganese recoveries were outside limits in the MS and/or MSD of CTMW-01D-20180621. The concentrations in the parent sample were > 4x the amount spiked. No qualification is needed.	
VFA-IC: Pyruvic acid recovery was low in the MS of CTMW-01S-2018062. The MSD was not analyzed.	

Data Verification and Validation Summary

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 \leq lab limits or \leq 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/No/No
<p>CTMW-01D-20180621 and CTMW-01D-20180621-FD: Orthophosphorus as PO4 was detected in CTMW-01D-20180621 and CTMW-01D-20180621-FD at concentrations <5X the RL. The difference between the parent and FD was > the RL. Chemical oxygen demand result was <5X the RL in CTMW-01D-20180621 and >5x the RL in CTMW-01D-20180621-FD. The difference between the parent and FD was > the RL. The RPD between 2-butanone results was 32%.</p>	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) 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 07/09/18

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 5 with MS/MSD

SDG/Report No.: 440-214189-1
 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		Yes	CTMW-04D-20180621: Qualify methane "J".
2. Chain-of-Custody		X	No	None
3. Holding Times		X	No	None
4. Blanks	X		Yes	CTMW-04S-20180621: Qualify dissolved aluminum "J". CTMW-04D-20180621: Qualify dissolved iron and zinc "J".
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	CTMW-04D-20180621: Qualify orthophosphate as P, and orthophosphorus as PO4, total iron "J-", pyruvic acid "UJ", chemical oxygen demand, phosphorus, sulfide, and total kjeldahl nitrogen "R".
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify results between the MDL and RL "J".
10. Data Package/EDD comparison (10%)		X	No	None
Verification and Validation Label	Stage_2A_Validation_Manual			
Verification and Validation Label Code	S2AVM			
<p>Overall Assessment: Results are acceptable as qualified, except for rejected results.</p> <p>Usability: Rejected results are not useable. Qualified sample results (UJ, J-, J) are considered useable for limited purposes. Other sample results are considered valid and useable for all purposes.</p>				

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperatures
CTMW-04S-20180621	440-214189-1	6/21/2018	1.4 °C/1.9 °C/3.1 °C
CTMW-04D-20180621	440-214189-2	6/21/2018	1.4 °C/1.9 °C/3.1 °C
CTMW-04D-20180621-MS	440-214189-2 MS	6/21/2018	1.4 °C/1.9 °C/3.1 °C
CTMW-04D-20180621-MSD	440-214189-2 MSD	6/21/2018	1.7 °C/1.9 °C/4.2 °C
M12-20180621-TB	440-214189-3	6/21/2018	1.7 °C/1.9 °C/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 4°C (+ or – 2°C)? Were samples received in proper condition?	Yes/No/No
RSK-175: CTMW-04D-20180621 was received and analyzed with headspace.	

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
6020: Aluminum was detected in MB 440-484625/1-F. Barium and iron were detected in MB 440-484150/1-B. Zinc was detected in MB 440-484150/1-F. In most cases, zinc and barium concentrations in the samples were > 10x the amount in the blanks or ND.	

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

Data Verification and Validation Summary

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/MSD of CTMW-04D-20180621. The concentration in the parent sample was > 4x the amount spiked, so recovery criteria do not apply.	
314.0: Perchlorate recoveries were outside limits in the MS/MSD of CTMW-04D-20180621. The concentration in the parent sample was > 4x the amount spiked, so recovery criteria do not apply.	
351.2: Total Kjeldahl Nitrogen was not recovered in the MS/MSD of CTMW-04D-20180621. Per inorganic NFG guidance, the data point is rejected.	
365.3: Orthophosphate as P, Orthophosphorus as PO ₄ , and Phosphorus, Total recoveries were below 30% in the MS/MSD of CTMW-04D-20180621. Orthophosphate as P and Orthophosphorus as PO ₄ will be qualified. Phosphorus, Total will be rejected.	
6010B: Total iron recoveries were low in the MS/MSD of CTMW-04D-20180621	
6020: Dissolved chromium, and dissolved chromium and manganese recoveries were outside limits in the MS/MSD of CTMW-04D-20180621 and MS/MSD of CTMW-04S-20180621, respectively. The concentrations in the parent samples were > 4x the amount spiked, so recovery criteria do not apply.	
7199: Hexavalent chromium recoveries were outside limits in the MS/MSD of CTMW-04D-20180621. The concentration in the parent sample was > 4x the amount spiked, so recovery criteria do not apply.	
SM4500-S2-D: Sulfide recoveries were below 30% in the MS/MSD of CTMW-04D-20180621. Per inorganic NFG guidance, the data point is rejected.	
SM5220D: Chemical oxygen demand was not recovered in the MS/MSD of CTMW-04D-20180621. Per inorganic NFG guidance, the data point is rejected.	
VFA-IC: Pyruvic acid recoveries were low in the MS/MSD of CTMW-04D-20180621.	

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/No/N/A
Lab duplicate RPDs were within limits.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) 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 07/09/18

Data Verification and Validation Summary

Project Name: In-Situ Chromium Monitoring
 Task No.: M12
 No. of Samples: 4

SDG/Report No.: 440-214285-1
 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		Yes	CTMW-06D-20180622, CTMW-06S-20180622: Qualify VOCs “J” for detects and “UJ” for non-detects.
4. Blanks	X		Yes	CTMW-06D-20180622, CTMW-06S-20180622, CTMW-07D-20180622: Qualify dissolved aluminum “J+”. CTMW-06S-20180622, CTMW-07D-20180622: Qualify total chromium “J+”.
5. Surrogates/Monitoring Compounds		X	No	None
6. Matrix Spike/Matrix Spike Duplicate	X		Yes	CTMW-06S-20180622: Qualify selenium “J”.
7. Laboratory Control Samples		X	No	None
8. Duplicates		X	No	None
9. Compound Quantitation and Reporting Limits		X	Yes	All: Qualify results between the MDL and RL “J”.
10. Data Package/EDD comparison (10%)		X	No	None
11. Other – Continuing Calibration	X		Yes	M12-20180622-TB and CTMW-07D-20180622: Qualify 2,2-dichloropropane “UJ”.
Verification and Validation Label		Stage_2A_Validation_Manual		
Verification and Validation Label Code		S2AVM		
<p>Overall Assessment: Results are acceptable as qualified.</p> <p>Usability: Qualified sample results (UJ, J, J+) are considered useable for limited purposes. Other sample results are considered valid and useable for all purposes.</p>				

Data Verification and Validation Summary

Sample Information:

Field Sample Number	Lab Sample ID	Date Collected	Cooler Temperatures
M12-20180622-TB	440-214285-1	6/22/2018	2.4 °C/3.3 °C/3.9 °C
CTMW-06S-20180622	440-214285-2	6/22/2018	2.4 °C/3.3 °C/3.9 °C
CTMW-06D-20180622	440-214285-3	6/22/2018	2.4 °C/3.3 °C/3.9 °C
CTMW-07D-20180622	440-214285-4	6/22/2018	2.4 °C/3.3 °C/3.9 °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 4°C (+ or – 2°C)? Were samples received in proper condition?	Yes/Yes/No
RSK-175: Two of three vials of CTMW-06S-20180622 were received with headspace. The lab analyzed the bottle with no headspace.	
8260B: CTMW-06S-20180622 and CTMW-06D-20180622 were received at pH > 2. Unpreserved samples are allowed by the method.	

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
8260B: CTMW-06S-20180622 and CTMW-06D-20180622 were not analyzed within 7 days 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: Total chromium was detected in MB 440-485831/1-A.	
6020: Aluminum was detected in MB 440-484831/1-E.	

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
6020: Dissolved selenium recovery was low in the MSD of CTMW-06S-20180622. Dissolved manganese recovery was low in the MS of CTMW-06S-20180622. The concentration of dissolved manganese in the parent sample was > 4x the amount spiked, so recovery criteria do not apply.	

Data Verification and Validation Summary

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 \leq lab limits or \leq 30% (water)/50% (soil) for field duplicates? For REG/FD results < 5x the RL, were differences between the two values < RL.	Yes/No/N/A
Lab duplicate RPDs were within limits.	

9. Compound Quantitation and Reporting Limits	
Were quantitation limits (RLs) 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 - Calibration	
This was mentioned in the case narrative and verified by the validator.	
8260B: In CCVIS 440-485540/2, 2,2-dichloropropane %D was high, 35.3%. SOP limit is 30%.	

Validated by: Maureen McMyler 07/10/18

Appendix E.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 E.3

DVSR Database

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.