

# Data Validation Summary Report

## May 2016 Surface Water Sampling

(Revision 1)

NERT Remedial Investigation – Downgradient Study Area  
Nevada Environmental Response Trust Site  
Henderson, Nevada

Final





Environment

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## May 2016 Surface Water Sampling

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Final

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## List of Acronyms

CCB	Continuing Calibration Blank
DQO	Data Quality Objective
DCS	Duplicate Control Sample
EB	Equipment Blank
EPA	Environmental Protection Agency
FB	Field Blank
FD	Field Duplicate
ICB	Initial Calibration Blank
LCS/LCSD	Laboratory Control Sample / Laboratory Control Sample Duplicate
MDL	Method Detection Limit
MS/MSD	Matrix Spike / Matrix Spike Duplicate
NDEP	Nevada Division of Environmental Protection
NERT	Nevada Environmental Response Trust
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance / Quality Control
QAPP	Quality Assurance Project Plan
RPD	Relative Percent Difference
SDG	Sample Delivery Group
SQL	Sample Quantitation Limit
TDS	Total Dissolved Solids

## 1.0 Introduction

This data validation summary report has been prepared by AECOM to assess the validity and usability of laboratory analytical data from the May 2016 surface water sampling conducted in the Downgradient Study Area of the Nevada Environmental Response Trust (NERT) site in Henderson, Nevada. This document was revised to respond to comments received via email on March 17, 2017. A memo describing the response to comments is provided as **Attachment A**. The assessment was performed by AECOM under their April 7, 2016, Quality Assurance Project Plan (QAPP) and included the collection and analyses of 31 environmental and quality control (QC) samples including 27 for wet chemistry analysis and dissolved chromium analysis and four equipment and field blanks. The analyses were performed by the following methods:

- Dissolved Chromium by Environmental Protection Agency (EPA) Method 200.8; and
- Wet Chemistry:
  - Hexavalent Chromium by EPA Method 218.7,
  - Chloride, and Bromide (Anions) by EPA Method 300.0,
  - Chlorate by EPA Method 300.1B,
  - Perchlorate by EPA Method 314.0, and
  - Total Dissolved Solids (TDS) by Standard Method 2540C.

Laboratory analytical services were provided by TestAmerica Laboratories, Inc. (Irvine, California) and Silver State Analytical Laboratories (Las Vegas, Nevada). The samples were grouped into sample delivery groups (SDGs). The water samples are associated with quality assurance (QA)/QC samples designed to document the data quality of the entire SDG or a sub-group of samples within an SDG. **Table 1** is a cross-reference table listing each sample, analysis, SDG, collection date, laboratory sample identification, matrix, and validation level. **Table 2** is a reference table that identifies the QC elements reviewed for each validation level per method, as applicable.

The laboratory analytical data were validated in accordance with procedures described in the Nevada Division of Environmental Protection (NDEP) Data Verification and Validation Requirements - Supplement established for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada, dated April 13, 2009. Consistent with the NDEP requirements, all of the analytical data were validated according to at least Stage 2B data validation procedures and at least 10 percent of the analytical data (in this case 5 out of 24 primary samples) were validated according to Stage 4 data validation procedures. The analytical data were evaluated for QA/QC based on the following documents: AECOM's QAPP Downgradient Study Area, Henderson, Nevada, Revision, dated April 2016; NDEP's Revised Guidance on Qualifying Data due to Blank Contamination for the BMI Complex and Common Areas, dated January 5 2012; EPA's Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, dated August 2014; and EPA's SW 846 Third Edition, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015). This report summarizes the QA/QC evaluation of the data according to precision, accuracy, representativeness, completeness, comparability, 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.

The PARCCS summary report evaluates and summarizes the results of QA/QC data validation for the entire sampling program. Each analytical fraction has a separate section for each PARCCS criterion. These sections interpret specific QC deviations and their effects on both individual data points and the analyses as a whole.

Section 5.0 presents a summary of the PARCCS criteria by comparing quantitative parameters with acceptability criteria defined in the project DQOs. Qualitative PARCCS criteria are also summarized in this section.

## 1.1 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 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 assess the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. QA/QC samples include: equipment blanks (EBs), field blanks (FBs), field duplicates (FDs), method blanks, laboratory control samples/laboratory control sample duplicates (LCS/LCSDs), and matrix spike/matrix spike duplicates (MS/MSDs).

Before conducting the PARCCS evaluation, the analytical data were validated according to the QAPP (AECOM 2016), Functional Guidelines (EPA 2014), and EPA SW 846 Test Methods (EPA 2015). Samples not meeting the acceptance criteria were qualified with a flag, an abbreviation indicating a deficiency with the data. The following are flags used in data validation.

- J- Estimated - The associated numerical value is an estimated quantity with a negative bias. The analyte was detected but the reported value may not be accurate or precise.
- J+ Estimated - The associated numerical value is an estimated quantity with a positive bias. The analyte was detected but the reported value may not be accurate or precise.
- J Estimated - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. The associated numerical value is the approximate concentration of the analyte in the sample. It is not possible to assess the direction of the potential bias. The analyte was detected but the reported value may not be accurate or precise. The "J" qualification indicates the data fell outside of the QC limits or any result that is detected in an environmental sample and associated blank at less than the required action level, but the exceedance was not sufficient to cause rejection of the data. Data is not rejected on the basis of blank contamination.
- R Rejected - The data are unusable (the compound or analyte may or may not be present). Use of the "R" qualifier indicates a significant variance from functional guideline acceptance criteria. Either resampling or reanalysis is necessary to determine the presence or absence of the rejected analyte.
- U Nondetected - Analyses were performed for the compound or analyte, but it was not detected.
- UJ Estimated/Nondetected - The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- DNR Do Not Report - A more appropriate result is reported from another analysis or dilution.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

The hierarchy of flags is listed below:

R > J	The R flag will always take precedence over the J qualifier.
J+	The high bias (J+) flag is applied only to detected results.
J > J+ or J-	A non-biased (J) flag will always supersede biased (J+ or J-) flags because it is not possible to assess the direction of the potential bias.
J = J+ plus J-	Adding biased (J+, J-) flags with opposite signs will result in a nonbiased flag (J).
UJ = U plus J	The UJ flag is used when a non-detected (U) flag is added to a J flag.

**Table 3** lists the reason codes used. Reason codes explain why flags have been applied and identify possible limitations of data use. Reason codes are cumulative except when one of the flags is R then only the reason code associated to the R flag will be used.

**Table 4** presents the analytical data validation results, including the qualified results after all the flags or validation qualifiers and associated reason codes have been applied.

Once the data are reviewed and qualified according to the QAPP, Functional Guidelines, and EPA Test Methods, the data set is then evaluated using PARCCS criteria. PARCCS criteria provide an evaluation of overall data usability. The following is a discussion of PARCCS criteria as related to the project DQOs.

**Precision** measures the reproducibility of repetitive measurements. It is defined as the degree of mutual agreement among independent measurements as the result of repeated application of the sample analytical process under similar conditions.

Components of precision include analytical precision and total precision. Analytical precision is a measurement of the variability associated with duplicate or replicate analyses of the same sample in the laboratory, and is determined by analysis of laboratory quality control samples, such as duplicate control samples (LCSD or DCS), matrix spike duplicates (MSD), or sample duplicates. If the recoveries of analytes in the specified control samples are comparable within established control limits, then precision is within limits.

Total precision is a measurement of the variability associated with the entire sampling and analytical process. It is determined by analysis of duplicate or replicate field samples, and measures variability introduced by both the laboratory and field operations. Field duplicate samples are analyzed to assess field and analytical precision.

Duplicate results are assessed using the relative percent difference (RPD) between duplicate measurements. If the RPD for laboratory quality control samples exceeds the laboratory's statistically determined acceptance ranges, data will be qualified as described in the applicable validation procedure. If the RPD between primary and duplicate field samples exceeds 50 percent for groundwater, data will be qualified as described in the applicable validation procedure. The RPD will be calculated as follows:

$$RPD = 200\% \times \frac{X_2 - X_1}{X_2 + X_1}$$

where X1 is the smaller of the two observed values, and X2 is the larger of the two observed values.

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



**Accuracy** is a measure of the agreement of an experimental determination and the true value of the parameter being measured. It is used to identify bias in a given measurement system. Recoveries outside of acceptable QC limits may be caused by factors such as instrumentation, analyst error, or matrix interference. Accuracy is assessed through the analysis of MS, MSD, 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 of inorganic analyses is determined using the percent recoveries of MS and LCS analyses.

Percent recovery (%R) is calculated using the following equation:

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

where:

A = measured concentration in the spiked sample

B = measured concentration of the spike compound in the unspiked sample

C = concentration of the spike

The percent recovery of each analyte spiked in MS/MSD samples and LCS/LCSDs is evaluated with the acceptance criteria specified by the previously noted documents. Spike recoveries outside of 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.

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

A method blank is a laboratory-grade water or solid matrix that contains the method reagents and has undergone the same preparation and analysis as the environmental samples. The method blank provides a measure of the combined contamination derived from the laboratory source water, glassware, instruments, reagents, and sample preparation steps. Method blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

Initial and continuing calibration blanks (ICB/CCBs) consist of acidified laboratory-grade water, which are injected at the beginning and at a regular frequency during each 12-hour sample analysis run. 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 and measures efficiency of the decontamination procedure. EBs were collected and analyzed for all target analytes.

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

For inorganic analyses, 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 were greater than the PQL and sample result is less than 10 times the blank contaminant value. The blanks and associated samples were evaluated according to the NDEP's Revised Guidance on Qualifying Data due to Blank Contamination for the BMI Complex and Common Areas (NDEP 2012).

Holding times are evaluated to assure that the sample integrity is intact for accurate sample preparation and analysis. Holding times will be specific for each method and matrix analyzed. Holding time exceedance can cause loss of sample constituents due to biodegradation, precipitation, volatilization, and chemical degradation. In accordance with EPA guidance (EPA 2014), sample results for analyses that were performed after the method holding time but less than two times the method holding time (if any) would be qualified as estimated (J- or UJ), and nondetect sample results for analyses that were performed after two times the method holding time would be qualified as rejected (R). Detected results are not to be rejected.

**Comparability** is a qualitative expression of the confidence with which one data set may be compared to another. It provides an assessment of the equivalence of the analytical results to data obtained from other analyses. It is important that data sets be comparable if they are used in conjunction with other data sets. The factors affecting comparability include the following: sample collection and handling techniques, matrix type, and analytical method. If these aspects of sampling and analysis are carried out according to standard analytical procedures, the data are considered comparable. Comparability is also dependent upon other PARCCS criteria, because data sets can be compared with confidence only when precision, accuracy, and representativeness are known.

**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. As specified in the project DQOs, the goal for completeness for target analytes in each analytical fraction is 90 percent.

Percent completeness (%C) is calculated using the following equation:

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

where:

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.

**Sensitivity** is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. This capability is established during the planning phase to meet the DQOs. It is important that calibration requirements, detection limits, and PQLs presented in the QAPP are achieved and that target analytes can be detected at concentrations necessary to support the DQOs. The method detection limits (MDLs) represent 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. PQLs are the lowest level at which the entire analytical system gives a recognizable signal and acceptable calibration point for the analyte. The laboratory is required to report detected analytes down to the MDL for this project. The laboratory uses a formatter that reports estimated values down to the MDL. In addition, sample results are compared to method blank and FB results to identify potential effects of laboratory background and field procedures on sensitivity.

The following sections present a review of QC data for metals analysis (dissolved chromium) and wet chemistry analyses (hexavalent chromium, bromide, chloride, chlorate, perchlorate, and TDS).

## 2.0 Metals Analysis - Dissolved Chromium

A total of 24 water samples and three field duplicate samples were analyzed for dissolved chromium by EPA Method 200.8. Two field blank and two equipment blank samples were also analyzed. None of the results were rejected based on holding time and/or QC exceedances. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

### 2.1 Precision and Accuracy

#### 2.1.1 Instrument Calibration

Initial and continuing calibration verification results provide a means of evaluating accuracy within a particular SDG. Correlation coefficient and percent recovery are the two major parameters used to measure the effectiveness of instrument calibration. The correlation coefficient indicates the linearity of the calibration curve. Percent recovery is used to verify the ongoing calibration acceptability of the analytical system. The most critical of the two calibration parameters, correlation coefficient, has the potential to affect data accuracy across an SDG when it is outside of the acceptable QC limits. Percent recovery exceedances suggest more routine instrumental anomalies, which typically impact all sample results for the affected analytes.

The correlation coefficients in all initial calibrations were within the acceptance criteria of greater than or equal to ( $\geq$ ) 0.995 and the percent recoveries in the continuing calibration verifications met the acceptance criteria of 90 to 110 percent.

#### 2.1.2 Internal Standards

All internal standard relative intensities were within acceptance criteria.

#### 2.1.3 MS/MSD Samples

MS/MSD percent recoveries were within acceptance criteria as stated in the QAPP; therefore, no chromium results were qualified based on this criterion. The details are presented in **Attachment B**, Section VI.

#### 2.1.4 LCS/LCSD Samples

All LCS/LCSD percent recoveries and RPDs met acceptance criteria as stated in the QAPP.

#### 2.1.5 Inductively Coupled Plasma/Mass Spectrometry Interference Check Samples

All validated Inductively Coupled Plasma/Mass Spectrometry interference check percent recoveries met acceptance criteria as stated in the QAPP.

#### 2.1.6 FD Samples

The FDs were evaluated for acceptable precision with RPDs. When the sample or FD concentration is less than the PQL, the PQL is used for calculation purposes. All field duplicate RPDs were within the acceptance criteria. The FD RPDs are presented in detail in **Attachment B**, Section X.

#### 2.1.7 Analyte Quantitation and Target Identification

Raw data were evaluated for the Stage 4 samples. All analyte quantitation and target identifications were acceptable.

## 2.2 Representativeness

### 2.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with the method was conducted. All samples met the 180-day analysis holding time criteria for dissolved chromium.

### 2.2.2 Blanks

Method blanks, ICB/CCBs, were analyzed to evaluate representativeness. The concentration for an individual target compound in any of the types of QA/QC blanks was used for data qualification.

If contaminants were detected in a blank, flags were assigned for the chemical analytical data during data validation based on the following criteria.

Results Below the PQL If a sample result and blank contaminant value were less than the PQL, the sample result was amended as non-detect (U) at the PQL because 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.

Results Above the PQL If a sample result and blank contaminant value were both greater than the PQL and both less than 10 times the blank contaminant value or if a sample result and blank contaminant value were greater than the PQL and the sample result is less than 10 times the blank contaminant value, the sample result was qualified as detected estimated (J+) at the concentration reported in the sample results.

No Action If blank contaminant values were less than the PQL and associated sample results were greater than the PQL, or if blank contaminant values were greater than the PQL and associated sample results were greater than 10 times the blank contaminant value, the result was not amended.

#### 2.2.2.1 Method and Calibration Blanks

Dissolved chromium was not detected in the method or calibration blanks for this analysis.

#### 2.2.2.2 EBs and FBs

Dissolved chromium was not detected in EBs and FBs.

## 2.3 Comparability

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. Data validation review indicates that target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the metals data is regarded as acceptable.

## 2.4 Completeness

The completeness level attained for metal field samples was 100 percent; no results were rejected.

## 2.5 Sensitivity

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

## 3.0 Wet Chemistry Analysis

A total of 24 primary water samples and three field duplicates were analyzed for hexavalent chromium by EPA Method 218.7; chloride and bromide by EPA Method 300.0; chlorate by EPA Method 300.1B; perchlorate by EPA Method 314.0; and TDS by Standard Method 2540C. Two equipment blanks and two field blanks were also analyzed. All wet chemistry data were assessed to be valid. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

### 3.1 Precision and Accuracy

#### 3.1.1 Instrument Calibration

As previously discussed in Section 2.1.1, initial and continuing calibration results provide a means of evaluating accuracy.

Instrument calibrations were evaluated for all wet chemistry methods. The correlation coefficients in the initial calibrations were within the acceptance criteria of  $\geq 0.995$ , and the percent recoveries in the continuing calibration verifications met the acceptance criteria.

#### 3.1.2 Surrogate

Surrogate (dichloroacetic acid) recoveries were evaluated for chlorate analysis by EPA Method 300.1B. All surrogate percent recoveries met the acceptance criteria as stated in the QAPP.

#### 3.1.3 MS/MSD Samples

MS/MSD percent recoveries were within acceptance criteria as stated in the QAPP; therefore, no results were qualified based on this criterion. The details regarding the qualification of results are presented in **Attachment C**, Section VII.

#### 3.1.4 Duplicate Samples

Duplicate samples were evaluated for TDS analysis by SM 2540c. All duplicate RPDs met the acceptance criteria as stated in the QAPP.

#### 3.1.5 LCS Samples

LCS samples were evaluated for all wet chemistry methods. All LCS percent recoveries met the acceptance criteria as stated in the QAPP.

#### 3.1.6 FD Samples

The FD samples were evaluated for acceptable precision with RPDs. Results for bromide were qualified in the following samples: LWC3.4-20160510 and LWC3.4-20160510-FD. The details regarding the qualification of results are presented in **Attachment C**, Section X.

#### 3.1.7 Analyte Quantitation and Target Identification

Raw data were evaluated for the Stage 4 samples. All analyte quantitation and target identifications were acceptable. In instances where data exceeded the calibration range and was subsequently diluted, the data was

qualified as not reportable by the laboratory in order to yield only one complete set of data for a given sample. The details regarding the qualification of results are presented in **Attachment C**, Section XII.

## **3.2 Representativeness**

### **3.2.1 Sample Preservation and Holding Times**

The evaluation of holding times to verify compliance with all wet chemistry methods was conducted. All water samples met the 7-day analysis holding time criteria for TDS and hexavalent chromium and the 28-day analysis holding time criteria for chlorate, chloride, bromide, and perchlorate.

The details regarding sample preservation and holding times are presented in **Attachment C**, Section I.

### **3.2.2 Blanks**

As previously discussed in Section 2.2.2, method blanks, ICB/CCBs, EBs, and FBs were analyzed to evaluate representativeness.

#### **3.2.2.1 Method and Calibration Blanks**

No data were qualified due to contaminants detected in the method or calibration blanks for this analysis.

#### **3.2.2.2 EBs and FBs**

No contaminants were detected in the two EBs or the two FBs.

## **3.3 Comparability**

The laboratory used standard analytical methods for all of the analyses. In all cases, the SQLs attained were at or below the PQLs. Target compounds detected below the PQLs flagged (J) by the laboratory should be considered estimated. The comparability of the data is regarded as acceptable.

## **3.4 Completeness**

The completeness level attained for wet chemistry field samples was 100 percent; no results were rejected.

## **3.5 Sensitivity**

The calibration was evaluated for instrument sensitivity and was determined to be technically acceptable. All laboratory PQLs met the specified requirements described in the QAPP.

## **4.0 Variances in Analytical Performance**

The laboratory used standard analytical methods for all of the analyses throughout the project. No systematic variances in analytical performance were noted in the laboratory case narratives.

## 5.0 Summary of PARCCS Criteria

The validation reports present the PARCCS results for all SDGs. Each PARCCS criterion is discussed in detail in the following sections.

### 5.1 Precision and Accuracy

Precision and accuracy were evaluated using data quality indicators such as calibration, surrogate, MS/MSD, duplicate, LCS/LCSD, and FD. The precision and accuracy of the data set were considered acceptable after incorporation of validation-qualified results.

### 5.2 Representativeness

All calibrations were performed as required and met the acceptance criteria. All MS/MSD, LCS/LCSD, and FD acceptance criteria were met.

All samples for each method and matrix were evaluated for holding-time compliance. All samples were associated with a method blank in each individual SDG. The representativeness of the project data is considered acceptable after incorporation of validation-qualified results.

### 5.3 Comparability

Sampling frequency requirements were met in obtaining necessary EBs, FBs, and FDs. The laboratory used standard analytical methods for the analyses. The analytical results were reported in correct standard units. Sample integrity criteria were met. Sample preservation and holding times were within QC criteria. The overall comparability is considered acceptable after incorporation of validation-qualified results.

### 5.4 Completeness

Of the 217 total analyses reported, 0 sample results were rejected. The completeness for the SDGs is as follows:

Parameter	Total Analyses	Number of Rejects	Percent Completeness
Metals Analysis	31	0	100
Wet Chemistry Analysis	186	0	100
<b>Total</b>	<b>217</b>	<b>0</b>	<b>100</b>

The percentage completeness met the 90-percent DQO.

### 5.5 Sensitivity

Sensitivity was achieved by the laboratory to support the DQOs. Calibration concentrations and PQLs met the project requirements and low-level contamination in the method blanks, calibration blanks, EBs, and FBs did not affect sensitivity.



## 6.0 Conclusions and Recommendations

The analytical data quality assessment for the water sample laboratory analytical results generated during the May 2016 surface water sampling in the Downgradient Study Area of the NERT site in Henderson, Nevada, established that the overall project requirements and completeness levels were met. No results were rejected. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the Stage 2B and Stage 4 data validation, all other results are considered valid and usable for all purposes.

## 7.0 References

AECOM. 2016. Quality Assurance Project Plan, Downgradient Study Area, Henderson, Nevada (QAPP), Revision. April 17.

Environmental Protection Agency (EPA). 2014. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. August.

———.1983. EPA Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Cincinnati, Ohio. March.

———.2015. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015).

Nevada Division of Environmental Protection (NDEP). 2009. Data Verification and Validation Requirements - Supplement established for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada. April 13.

———. 2012. Revised Guidance on Qualifying Data due to Blank Contamination for the BMI Complex and Common Areas. January 5.

## Tables

**Table 1  
Sample Cross Reference  
NERT RI Downgradient Study Area  
Henderson, Nevada**

Sample Delivery Group	Client Sample Identification	Laboratory Sample Identification	Matrix	Sample Date	Quality Control Type	Validation Level	Bromide (E300)	Chlorate (E300.1)	Chloride (E300)	Chromium (E200.8)	Chromium, Hexavalent (E218.7)	Perchlorate (E314.0)	Total Dissolved Solids (SM2540C)
16-3418	LW3.1-20160510	16-3418-01A	W	05/10/16		Stage 2B					X		
16-3418	LW3.4-20160510	16-3418-02A	W	05/10/16		Stage 2B					X		
16-3418	LW3.4-20160510-FD	16-3418-03A	W	05/10/16	DUP	Stage 2B					X		
16-3418	LWC3.7-20160510	16-3418-04A	W	05/10/16		Stage 2B					X		
16-3463	KM67-20160511	16-3463-02A	W	05/11/16		Stage 2B					X		
16-3463	LW3.75-20160511	16-3463-01A	W	05/11/16		Stage 2B					X		
16-3463	LW3.85-20160511	16-3463-03A	W	05/11/16		Stage 2B					X		
16-3463	LW4.1-20160511	16-3463-04A	W	05/11/16		Stage 2B					X		
16-3463	LWC4.1-20160511	16-3463-05A	W	05/11/16		Stage 2B					X		
16-3489	LW4.95-20160512	16-3489-2A	W	05/12/16		Stage 2B					X		
16-3489	LWC4.6-20160512	16-3489-1A	W	05/12/16		Stage 2B					X		
16-3527	LW5.3-20160513	16-3527-01A	W	05/13/16		Stage 2B					X		
16-3527	LW5.5-20160513	16-3527-02A	W	05/13/16		Stage 2B					X		
16-3527	LW5.7-20160513	16-3527-03A	W	05/13/16		Stage 2B					X		
16-3557	KM71-20160516	16-3557-3A	W	05/16/16		Stage 2B					X		
16-3557	KM71-20160516-FD	16-3557-4A	W	05/16/16	DUP	Stage 2B					X		
16-3557	LW3.1-20160516-FB	16-3557-8A	W	05/16/16	TB	Stage 2B					X		
16-3557	LW5.9-20160516	16-3557-1A	W	05/16/16		Stage 2B					X		
16-3557	LW6.05-20160516	16-3557-2A	W	05/16/16		Stage 2B					X		
16-3557	LWC6.1-20160516	16-3557-5A	W	05/16/16		Stage 2B					X		
16-3557	LWC6.1-20160516-EB	16-3557-9A	W	05/16/16	FB	Stage 2B					X		
16-3595	KM-S-20160517	16-3595-5A	W	05/17/16		Stage 2B					X		
16-3595	LW6.7-20160517	16-3595-6A	W	05/17/16		Stage 2B					X		
16-3595	LW6.7-20160517-EB	16-3595-9A	W	05/17/16	FB	Stage 2B					X		
16-3595	LW6.7-20160517-FB	16-3595-10A	W	05/17/16	TB	Stage 2B					X		
16-3595	LWC6.1-1-20160517	16-3595-3A	W	05/17/16		Stage 2B					X		
16-3595	LWC6.1-2-20160517	16-3595-4A	W	05/17/16		Stage 2B					X		
16-3595	LWC6.3-1-20160517	16-3595-1A	W	05/17/16		Stage 2B					X		
16-3595	LWC6.3-1-20160517-FD	16-3595-2A	W	05/17/16	DUP	Stage 2B					X		
16-3632	LW6.85-20160518	16-3632-01A	W	05/18/16		Stage 2B					X		
16-3632	LW7.2-20160518	16-3632-02A	W	05/18/16		Stage 2B					X		
440-147074	LWC3.1-20160510	440-147074-4	W	05/10/16		Stage 2B	X	X	X	X		X	X
440-147074	LWC3.4-20160510	440-147074-3	W	05/10/16		Stage 2B	X	X	X	X		X	X
440-147074	LWC3.4-20160510-FD	440-147074-2	W	05/10/16	DUP	Stage 2B	X	X	X	X		X	X
440-147074	LWC3.7-20160510	440-147074-1	W	05/10/16		Stage 2B	X	X	X	X		X	X
440-147311	KM 67-20160511	440-147311-5	W	05/11/16		Stage 2B	X	X	X	X		X	X
440-147311	LW 3.75-20160511	440-147311-4	W	05/11/16		Stage 2B	X	X	X	X		X	X
440-147311	LW 3.8520160511	440-147311-2	W	05/11/16		Stage 2B	X	X	X	X		X	X
440-147311	LW 4.1-20160511	440-147311-1	W	05/11/16		Stage 2B	X	X	X	X		X	X
440-147311	LWC 4.1-20160511	440-147311-3	W	05/11/16		Stage 2B	X	X	X	X		X	X
440-147428	LW 4.95-20160512	440-147428-2	W	05/12/16		Stage 2B	X	X	X	X		X	X
440-147428	LWC 4.6-20160512	440-147428-1	W	05/12/16		Stage 2B	X	X	X	X		X	X
440-147491	LW5.3-20160513	440-147491-1	W	05/13/16		Stage 2B	X	X	X	X		X	X
440-147491	LW5.5-20160513	440-147491-3	W	05/13/16		Stage 2B	X	X	X	X		X	X
440-147491	LW5.7-20160513	440-147491-2	W	05/13/16		Stage 2B	X	X	X	X		X	X
440-147639	KM71-20160516	440-147639-3	W	05/16/16		Stage 2B	X	X	X	X		X	X
440-147639	KM71-20160516-FD	440-147639-4	W	05/16/16	DUP	Stage 2B	X	X	X	X		X	X

**Table 1  
Sample Cross Reference  
NERT RI Downgradient Study Area  
Henderson, Nevada**

Sample Delivery Group	Client Sample Identification	Laboratory Sample Identification	Matrix	Sample Date	Quality Control Type	Validation Level	Bromide (E300)	Chlorate (E300.1)	Chloride (E300)	Chromium (E200.8)	Chromium, Hexavalent (E218.7)	Perchlorate (E314.0)	Total Dissolved Solids (SM2540C)
440-147639	LW5.9-20160516	440-147639-1	W	05/16/16		Stage 2B	X	X	X	X		X	X
440-147639	LW6.05-20160516	440-147639-2	W	05/16/16		Stage 2B	X	X	X	X		X	X
440-147639	LWL6.1-20160516	440-147639-5	W	05/16/16		Stage 2B	X	X	X	X		X	X
440-147788	KM-S-20160517	440-147788-4	W	05/17/16		Stage 2B	X	X	X	X		X	X
440-147788	LW 6.7-20160517	440-147788-5	W	05/17/16		Stage 2B	X	X	X	X		X	X
440-147788	LWC 6.1-1-20160517	440-147788-2	W	05/17/16		Stage 2B	X	X	X	X		X	X
440-147788	LWC 6.1-2-20160517	440-147788-3	W	05/17/16		Stage 2B	X	X	X	X		X	X
440-147788	LWC 6.3-1-20160517	440-147788-1	W	05/17/16		Stage 2B	X	X	X	X		X	X
440-147788	LWC 6.3.1-20160517-FD	440-147788-8	W	05/17/16	DUP	Stage 2B	X	X	X	X		X	X
440-147944	LW6.85-20160518	440-147944-1	W	05/18/16		Stage 2B	X	X	X	X		X	X
440-147944	LW7.2-20160518	440-147944-2	W	05/18/16		Stage 2B	X	X	X	X		X	X

**Table 2**  
**Validation Elements**  
**NERT Downgradient Study Area**  
**Henderson, Nevada**

Stage 2B	Metals	Wet Chemistry
Sample Receipt & Technical Holding Time	√	√
Initial Calibration (ICAL)	√	√
Initial Calibration Verification (ICV)	√	√
Continuing Calibration Verification (CCV)	√	√
Laboratory Blanks	√	√
Initial Calibration Blank and Continuing Calibration Blank (ICB/CCB)	√	√
Field Blanks	√	√
Inductively Coupled Plasma (ICP) Interference Check Sample	√	n/a
Surrogate Spikes	n/a	√
Matrix Spike (MS), Matrix Spike Duplicate (MSD)	√	√
Laboratory Duplicate (DUP)	n/a	√
Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	√	√
Serial Dilution	√	n/a
Field Duplicate	√	√
Project Quantitation Limits (QL)	√	√
Multiple Results for One Sample	√	√
Sample Result Verification - -	--	--
Overall Data Usability Assessment	√	√

Stage 4	Metals	Wet Chemistry
Sample Receipt & Technical Holding Time	√	√
Initial Calibration (ICAL)	√	√
Initial Calibration Verification (ICV)	√	√
Continuing Calibration Verification (CCV)	√	√
Laboratory Blanks	√	√
Initial Calibration Blank and Continuing Calibration Blank (ICB/CCB)	√	√
Field Blanks	√	√
Inductively Coupled Plasma (ICP) Interference Check Sample	√	n/a
Surrogate Spikes	n/a	√
Matrix Spike (MS), Matrix Spike Duplicate (MSD)	√	√
Laboratory Duplicate (DUP)	n/a	√
Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	√	√
Serial Dilution	√	n/a
Field Duplicate	√	√
Project Quantitation Limits (QL)	√	√
Multiple Results for One Sample	√	√
Sample Result Verification	√	√
Overall Data Usability Assessment	√	√

Notes:

√ = Reviewed

n/a = Not applicable to method or not performed during this sampling event

-- = Not applicable for Stage 2B review

**Table 3**  
**Qualification Codes and Definitions**  
**NERT Downgradient Study Area**  
**Henderson, Nevada**

Reason Code	Explanation
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 laboratory blank contamination
bt	qualified due to trip blank contamination
bp	qualified due to pump blank contamination (wells w/o dedicated pumps, when contamination is detected in the Pump Blk)
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 %D exceeded
e	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
k	qualified as Estimated Maximum Possible Concentrations (dioxins and PCB congeners)
l	qualified due to LCS recoveries
ld	qualified due to laboratory duplicate imprecision (matrix duplicate, MSD, LCSD)
m	qualified due to matrix spike recoveries
nb	qualified due to negative laboratory 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 >SQL <PQL
st	sample receipt temperature exceeded
t	qualified due to elevated helium tracer concentrations
vh	volatile headspace detected in aqueous sample containers submitted for VOC analysis
x	qualified due to low % solids
z	qualified due to ICS results

**Table 4**  
**Analytical Results of Surface Water and Seep Sampling with Data Validation Qualifiers**  
**NERT Downgradient Study Area**  
**Henderson, Nevada**

SDG	Client Sample Identification	Sample Date	Method	Client Analyte Identification	Analyte	Laboratory Result	Laboratory Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code	Reason Code Definition	Qualification Finding
16-3418	LW3.1-20160510	5/10/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3418	LW3.4-20160510	5/10/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3418	LW3.4-20160510-FD	5/10/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3418	LWC3.7-20160510	5/10/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3463	KM67-20160511	5/11/2016	E218.7	18540-29-9	Chromium, Hexavalent	10		0.090	1.0	ug/l				
16-3463	LW3.75-20160511	5/11/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3463	LW3.85-20160511	5/11/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3463	LW4.1-20160511	5/11/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3463	LWC4.1-20160511	5/11/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3489	LW4.95-20160512	5/12/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3489	LWC4.6-20160512	5/12/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3527	LW5.3-20160513	5/13/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3527	LW5.5-20160513	5/13/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3527	LW5.7-20160513	5/13/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3557	KM71-20160516	5/16/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3557	KM71-20160516-FD	5/16/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3557	LW3.1-20160516-FB	5/16/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3557	LW5.9-20160516	5/16/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3557	LW6.05-20160516	5/16/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3557	LWC6.1-20160516	5/16/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3557	LWC6.1-20160516-EB	5/16/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	KM-S-20160517	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	LW6.7-20160517	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	LW6.7-20160517-EB	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	LW6.7-20160517-FB	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	LWC6.1-1-20160517	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	LWC6.1-2-20160517	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	LWC6.3-1-20160517	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3595	LWC6.3-1-20160517-FD	5/17/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3632	LW6.85-20160518	5/18/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
16-3632	LW7.2-20160518	5/18/2016	E218.7	18540-29-9	Chromium, Hexavalent	0.090	U	0.090	1.0	ug/l				
440-147074	LWC3.1-20160510	5/10/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147074	LWC3.1-20160510	5/10/2016	E300	16887-00-6	Chloride	300		0.25	25	mg/l				
440-147074	LWC3.1-20160510	5/10/2016	E300	24959-67-9	Bromide	0.91		0.25	0.50	mg/l				
440-147074	LWC3.1-20160510	5/10/2016	E300.1	14866-68-3	Chlorate	220		100	200	ug/l				
440-147074	LWC3.1-20160510	5/10/2016	E314.0	14797-73-0	Perchlorate	51		0.95	4.0	ug/l				
440-147074	LWC3.1-20160510	5/10/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147074	LWC3.4-20160510	5/10/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147074	LWC3.4-20160510	5/10/2016	E300	16887-00-6	Chloride	300		0.25	25	mg/l				
440-147074	LWC3.4-20160510	5/10/2016	E300	24959-67-9	Bromide	1.4		0.25	0.50	mg/l	J	fd	FD RPD >30%	RPD=36%
440-147074	LWC3.4-20160510	5/10/2016	E300.1	14866-68-3	Chlorate	210		100	200	ug/l				
440-147074	LWC3.4-20160510	5/10/2016	E314.0	14797-73-0	Perchlorate	52		0.95	4.0	ug/l				



**Table 4**  
**Analytical Results of Surface Water and Seep Sampling with Data Validation Qualifiers**  
**NERT Downgradient Study Area**  
**Henderson, Nevada**

SDG	Client Sample Identification	Sample Date	Method	Client Analyte Identification	Analyte	Laboratory Result	Laboratory Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code	Reason Code Definition	Qualification Finding
440-147074	LWC3.4-20160510	5/10/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147074	LWC3.4-20160510-FD	5/10/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147074	LWC3.4-20160510-FD	5/10/2016	E300	16887-00-6	Chloride	300		0.25	25	mg/l				
440-147074	LWC3.4-20160510-FD	5/10/2016	E300	24959-67-9	Bromide	0.97		0.25	0.50	mg/l	J	fd	FD RPD >30%	RPD=36%
440-147074	LWC3.4-20160510-FD	5/10/2016	E300.1	14866-68-3	Chlorate	220		100	200	ug/l				
440-147074	LWC3.4-20160510-FD	5/10/2016	E314.0	14797-73-0	Perchlorate	56		0.95	4.0	ug/l				
440-147074	LWC3.4-20160510-FD	5/10/2016	SM2540C	TDS	Total Dissolved Solids	1600		5.0	10	mg/l				
440-147074	LWC3.7-20160510	5/10/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147074	LWC3.7-20160510	5/10/2016	E300	16887-00-6	Chloride	300		0.25	25	mg/l				
440-147074	LWC3.7-20160510	5/10/2016	E300	24959-67-9	Bromide	0.93		0.25	0.50	mg/l				
440-147074	LWC3.7-20160510	5/10/2016	E300.1	14866-68-3	Chlorate	260		100	200	ug/l				
440-147074	LWC3.7-20160510	5/10/2016	E314.0	14797-73-0	Perchlorate	61		0.95	4.0	ug/l				
440-147074	LWC3.7-20160510	5/10/2016	SM2540C	TDS	Total Dissolved Solids	1600		5.0	20	mg/l				
440-147311	KM 67-20160511	5/11/2016	E200.8	7440-47-3	Chromium	6.3		0.50	2.0	ug/l				
440-147311	KM 67-20160511	5/11/2016	E300	16887-00-6	Chloride	580		0.50	50	mg/l				
440-147311	KM 67-20160511	5/11/2016	E300	24959-67-9	Bromide	0.50	U	0.50	1.0	mg/l				
440-147311	KM 67-20160511	5/11/2016	E300.1	14866-68-3	Chlorate	4400		200	400	ug/l				
440-147311	KM 67-20160511	5/11/2016	E314.0	14797-73-0	Perchlorate	1500		95	400	ug/l				
440-147311	KM 67-20160511	5/11/2016	SM2540C	TDS	Total Dissolved Solids	3500		5.0	50	mg/l				
440-147311	LW 3.75-20160511	5/11/2016	E200.8	7440-47-3	Chromium	0.52	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147311	LW 3.75-20160511	5/11/2016	E300	16887-00-6	Chloride	290		0.25	25	mg/l				
440-147311	LW 3.75-20160511	5/11/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147311	LW 3.75-20160511	5/11/2016	E300.1	14866-68-3	Chlorate	160		50	100	ug/l				
440-147311	LW 3.75-20160511	5/11/2016	E314.0	14797-73-0	Perchlorate	26		0.95	4.0	ug/l				
440-147311	LW 3.75-20160511	5/11/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147311	LW 3.8520160511	5/11/2016	E200.8	7440-47-3	Chromium	0.51	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147311	LW 3.8520160511	5/11/2016	E300	16887-00-6	Chloride	290		0.25	25	mg/l				
440-147311	LW 3.8520160511	5/11/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147311	LW 3.8520160511	5/11/2016	E300.1	14866-68-3	Chlorate	190		50	100	ug/l				
440-147311	LW 3.8520160511	5/11/2016	E314.0	14797-73-0	Perchlorate	35		0.95	4.0	ug/l				
440-147311	LW 3.8520160511	5/11/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147311	LW 4.1-20160511	5/11/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147311	LW 4.1-20160511	5/11/2016	E300	16887-00-6	Chloride	300		0.25	25	mg/l				
440-147311	LW 4.1-20160511	5/11/2016	E300	24959-67-9	Bromide	0.38	J	0.25	0.50	mg/l	J	sp	Detect <PQL	-
440-147311	LW 4.1-20160511	5/11/2016	E300.1	14866-68-3	Chlorate	240		50	100	ug/l				
440-147311	LW 4.1-20160511	5/11/2016	E314.0	14797-73-0	Perchlorate	50		0.95	4.0	ug/l				
440-147311	LW 4.1-20160511	5/11/2016	SM2540C	TDS	Total Dissolved Solids	1800		5.0	20	mg/l				
440-147311	LWC 4.1-20160511	5/11/2016	E200.8	7440-47-3	Chromium	0.55	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147311	LWC 4.1-20160511	5/11/2016	E300	16887-00-6	Chloride	310		0.25	25	mg/l				
440-147311	LWC 4.1-20160511	5/11/2016	E300	24959-67-9	Bromide	0.36	J	0.25	0.50	mg/l	J	sp	Detect <PQL	-
440-147311	LWC 4.1-20160511	5/11/2016	E300.1	14866-68-3	Chlorate	210		50	100	ug/l				
440-147311	LWC 4.1-20160511	5/11/2016	E314.0	14797-73-0	Perchlorate	46		0.95	4.0	ug/l				

**Table 4**  
**Analytical Results of Surface Water and Seep Sampling with Data Validation Qualifiers**  
**NERT Downgradient Study Area**  
**Henderson, Nevada**

SDG	Client Sample Identification	Sample Date	Method	Client Analyte Identification	Analyte	Laboratory Result	Laboratory Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code	Reason Code Definition	Qualification Finding
440-147311	LWC 4.1-20160511	5/11/2016	SM2540C	TDS	Total Dissolved Solids	1600		5.0	10	mg/l				
440-147428	LW 4.95-20160512	5/12/2016	E200.8	7440-47-3	Chromium	0.78	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147428	LW 4.95-20160512	5/12/2016	E300	16887-00-6	Chloride	250		0.25	25	mg/l				
440-147428	LW 4.95-20160512	5/12/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147428	LW 4.95-20160512	5/12/2016	E300.1	14866-68-3	Chlorate	110		50	100	ug/l				
440-147428	LW 4.95-20160512	5/12/2016	E314.0	14797-73-0	Perchlorate	15		0.95	4.0	ug/l				
440-147428	LW 4.95-20160512	5/12/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	20	mg/l				
440-147428	LWC 4.6-20160512	5/12/2016	E200.8	7440-47-3	Chromium	0.62	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147428	LWC 4.6-20160512	5/12/2016	E300	16887-00-6	Chloride	260		0.25	25	mg/l				
440-147428	LWC 4.6-20160512	5/12/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147428	LWC 4.6-20160512	5/12/2016	E300.1	14866-68-3	Chlorate	230		50	100	ug/l				
440-147428	LWC 4.6-20160512	5/12/2016	E314.0	14797-73-0	Perchlorate	44		0.95	4.0	ug/l				
440-147428	LWC 4.6-20160512	5/12/2016	SM2540C	TDS	Total Dissolved Solids	1400		5.0	20	mg/l				
440-147491	LW5.3-20160513	5/13/2016	E200.8	7440-47-3	Chromium	0.75	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147491	LW5.3-20160513	5/13/2016	E300	16887-00-6	Chloride	290		0.25	25	mg/l				
440-147491	LW5.3-20160513	5/13/2016	E300	24959-67-9	Bromide	1.1		0.25	0.50	mg/l				
440-147491	LW5.3-20160513	5/13/2016	E300.1	14866-68-3	Chlorate	110		50	100	ug/l				
440-147491	LW5.3-20160513	5/13/2016	E314.0	14797-73-0	Perchlorate	23		0.95	4.0	ug/l				
440-147491	LW5.3-20160513	5/13/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147491	LW5.5-20160513	5/13/2016	E200.8	7440-47-3	Chromium	1.4	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147491	LW5.5-20160513	5/13/2016	E300	16887-00-6	Chloride	300		0.25	25	mg/l				
440-147491	LW5.5-20160513	5/13/2016	E300	24959-67-9	Bromide	1.3		0.25	0.50	mg/l				
440-147491	LW5.5-20160513	5/13/2016	E300.1	14866-68-3	Chlorate	100		50	100	ug/l				
440-147491	LW5.5-20160513	5/13/2016	E314.0	14797-73-0	Perchlorate	19		0.95	4.0	ug/l				
440-147491	LW5.5-20160513	5/13/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147491	LW5.7-20160513	5/13/2016	E200.8	7440-47-3	Chromium	1.2	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147491	LW5.7-20160513	5/13/2016	E300	16887-00-6	Chloride	280		0.25	25	mg/l				
440-147491	LW5.7-20160513	5/13/2016	E300	24959-67-9	Bromide	1.0		0.25	0.50	mg/l				
440-147491	LW5.7-20160513	5/13/2016	E300.1	14866-68-3	Chlorate	100		50	100	ug/l				
440-147491	LW5.7-20160513	5/13/2016	E314.0	14797-73-0	Perchlorate	8.3		0.95	4.0	ug/l				
440-147491	LW5.7-20160513	5/13/2016	SM2540C	TDS	Total Dissolved Solids	1400		5.0	10	mg/l				
440-147639	KM71-20160516	5/16/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147639	KM71-20160516	5/16/2016	E300	16887-00-6	Chloride	230		0.25	25	mg/l				
440-147639	KM71-20160516	5/16/2016	E300	24959-67-9	Bromide	1.3		0.25	0.50	mg/l				
440-147639	KM71-20160516	5/16/2016	E300.1	14866-68-3	Chlorate	14	J	10	20	ug/l	J	sp	Detect <PQL	-
440-147639	KM71-20160516	5/16/2016	E314.0	14797-73-0	Perchlorate	1.4	J	0.95	4.0	ug/l	J	sp	Detect <PQL	-
440-147639	KM71-20160516	5/16/2016	SM2540C	TDS	Total Dissolved Solids	1400		5.0	10	mg/l				
440-147639	KM71-20160516-FD	5/16/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147639	KM71-20160516-FD	5/16/2016	E300	16887-00-6	Chloride	230		0.25	25	mg/l				
440-147639	KM71-20160516-FD	5/16/2016	E300	24959-67-9	Bromide	1.6		0.25	0.50	mg/l				
440-147639	KM71-20160516-FD	5/16/2016	E300.1	14866-68-3	Chlorate	14	J	10	20	ug/l	J	sp	Detect <PQL	-
440-147639	KM71-20160516-FD	5/16/2016	E314.0	14797-73-0	Perchlorate	1.7	J	0.95	4.0	ug/l	J	sp	Detect <PQL	-

**Table 4**  
**Analytical Results of Surface Water and Seep Sampling with Data Validation Qualifiers**  
**NERT Downgradient Study Area**  
**Henderson, Nevada**

SDG	Client Sample Identification	Sample Date	Method	Client Analyte Identification	Analyte	Laboratory Result	Laboratory Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code	Reason Code Definition	Qualification Finding
440-147639	KM71-20160516-FD	5/16/2016	SM2540C	TDS	Total Dissolved Solids	1400		5.0	10	mg/l				
440-147639	LW3.1-20160516-FB	5/16/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147639	LW3.1-20160516-FB	5/16/2016	E300	16887-00-6	Chloride	0.25	U	0.25	0.50	mg/l				
440-147639	LW3.1-20160516-FB	5/16/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147639	LW3.1-20160516-FB	5/16/2016	E300.1	14866-68-3	Chlorate	10	U	10	20	ug/l				
440-147639	LW3.1-20160516-FB	5/16/2016	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/l				
440-147639	LW3.1-20160516-FB	5/16/2016	SM2540C	TDS	Total Dissolved Solids	5.0	U	5.0	10	mg/l				
440-147639	LW5.9-20160516	5/16/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147639	LW5.9-20160516	5/16/2016	E300	16887-00-6	Chloride	250		0.25	25	mg/l				
440-147639	LW5.9-20160516	5/16/2016	E300	24959-67-9	Bromide	1.7		0.25	0.50	mg/l				
440-147639	LW5.9-20160516	5/16/2016	E300.1	14866-68-3	Chlorate	120		50	100	ug/l				
440-147639	LW5.9-20160516	5/16/2016	E314.0	14797-73-0	Perchlorate	15		0.95	4.0	ug/l				
440-147639	LW5.9-20160516	5/16/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147639	LW6.05-20160516	5/16/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147639	LW6.05-20160516	5/16/2016	E300	16887-00-6	Chloride	250		0.25	25	mg/l				
440-147639	LW6.05-20160516	5/16/2016	E300	24959-67-9	Bromide	1.8		0.25	0.50	mg/l				
440-147639	LW6.05-20160516	5/16/2016	E300.1	14866-68-3	Chlorate	130		50	100	ug/l				
440-147639	LW6.05-20160516	5/16/2016	E314.0	14797-73-0	Perchlorate	17		0.95	4.0	ug/l				
440-147639	LW6.05-20160516	5/16/2016	SM2540C	TDS	Total Dissolved Solids	1500		5.0	10	mg/l				
440-147639	LWC6.7-20160517-EB	5/16/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147639	LWC6.7-20160517-EB	5/16/2016	E300	16887-00-6	Chloride	0.25	U	0.25	0.50	mg/l				
440-147639	LWC6.7-20160517-EB	5/16/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147639	LWC6.7-20160517-EB	5/16/2016	E300.1	14866-68-3	Chlorate	10	U	10	20	ug/l				
440-147639	LWC6.7-20160517-EB	5/16/2016	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/l				
440-147639	LWC6.7-20160517-EB	5/16/2016	SM2540C	TDS	Total Dissolved Solids	5.0	U	5.0	10	mg/l				
440-147639	LWL6.1-20160516	5/16/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147639	LWL6.1-20160516	5/16/2016	E300	16887-00-6	Chloride	460		0.50	50	mg/l				
440-147639	LWL6.1-20160516	5/16/2016	E300	24959-67-9	Bromide	3.5		0.50	1.0	mg/l				
440-147639	LWL6.1-20160516	5/16/2016	E300.1	14866-68-3	Chlorate	150		10	20	ug/l				
440-147639	LWL6.1-20160516	5/16/2016	E314.0	14797-73-0	Perchlorate	1.7	J	0.95	4.0	ug/l	J	sp	Detect <PQL	-
440-147639	LWL6.1-20160516	5/16/2016	SM2540C	TDS	Total Dissolved Solids	1800		5.0	10	mg/l				
440-147788	KM-S-20160517	5/17/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147788	KM-S-20160517	5/17/2016	E300	16887-00-6	Chloride	460		0.50	50	mg/l				
440-147788	KM-S-20160517	5/17/2016	E300	24959-67-9	Bromide	0.63	J	0.50	1.0	mg/l	J	sp	Detect <PQL	-
440-147788	KM-S-20160517	5/17/2016	E300.1	14866-68-3	Chlorate	20	U	20	40	ug/l				
440-147788	KM-S-20160517	5/17/2016	E314.0	14797-73-0	Perchlorate	85		0.95	4.0	ug/l				
440-147788	KM-S-20160517	5/17/2016	SM2540C	TDS	Total Dissolved Solids	2000		5.0	20	mg/l				
440-147788	LW 6.7-20160517	5/17/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147788	LW 6.7-20160517	5/17/2016	E300	16887-00-6	Chloride	230		0.25	25	mg/l				
440-147788	LW 6.7-20160517	5/17/2016	E300	24959-67-9	Bromide	0.41	J	0.25	0.50	mg/l	J	sp	Detect <PQL	-
440-147788	LW 6.7-20160517	5/17/2016	E300.1	14866-68-3	Chlorate	86		10	20	ug/l				
440-147788	LW 6.7-20160517	5/17/2016	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/l				

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SDG	Client Sample Identification	Sample Date	Method	Client Analyte Identification	Analyte	Laboratory Result	Laboratory Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code	Reason Code Definition	Qualification Finding
440-147788	LW 6.7-20160517	5/17/2016	SM2540C	TDS	Total Dissolved Solids	1300		5.0	10	mg/l				
440-147788	LW6.7-20160517-EB	5/17/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147788	LW6.7-20160517-EB	5/17/2016	E300	16887-00-6	Chloride	0.25	U	0.25	0.50	mg/l				
440-147788	LW6.7-20160517-EB	5/17/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147788	LW6.7-20160517-EB	5/17/2016	E300.1	14866-68-3	Chlorate	10	U	10	20	ug/l				
440-147788	LW6.7-20160517-EB	5/17/2016	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/l				
440-147788	LW6.7-20160517-EB	5/17/2016	SM2540C	TDS	Total Dissolved Solids	5.0	U	5.0	10	mg/l				
440-147788	LW6.7-20160517-FB	5/17/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147788	LW6.7-20160517-FB	5/17/2016	E300	16887-00-6	Chloride	0.25	U	0.25	0.50	mg/l				
440-147788	LW6.7-20160517-FB	5/17/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147788	LW6.7-20160517-FB	5/17/2016	E300.1	14866-68-3	Chlorate	10	U	10	20	ug/l				
440-147788	LW6.7-20160517-FB	5/17/2016	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/l				
440-147788	LW6.7-20160517-FB	5/17/2016	SM2540C	TDS	Total Dissolved Solids	5.0	U	5.0	10	mg/l				
440-147788	LWC 6.1-1-20160517	5/17/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147788	LWC 6.1-1-20160517	5/17/2016	E300	16887-00-6	Chloride	250		2.5	25	mg/l				
440-147788	LWC 6.1-1-20160517	5/17/2016	E300	24959-67-9	Bromide	2.5	U	2.5	5.0	mg/l				
440-147788	LWC 6.1-1-20160517	5/17/2016	E300.1	14866-68-3	Chlorate	240		50	100	ug/l				
440-147788	LWC 6.1-1-20160517	5/17/2016	E314.0	14797-73-0	Perchlorate	7.3		0.95	4.0	ug/l				
440-147788	LWC 6.1-1-20160517	5/17/2016	SM2540C	TDS	Total Dissolved Solids	1100		5.0	10	mg/l				
440-147788	LWC 6.1-2-20160517	5/17/2016	E200.8	7440-47-3	Chromium	0.61	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147788	LWC 6.1-2-20160517	5/17/2016	E300	16887-00-6	Chloride	91		0.25	10	mg/l				
440-147788	LWC 6.1-2-20160517	5/17/2016	E300	24959-67-9	Bromide	0.25	U	0.25	0.50	mg/l				
440-147788	LWC 6.1-2-20160517	5/17/2016	E300.1	14866-68-3	Chlorate	20	U	20	40	ug/l				
440-147788	LWC 6.1-2-20160517	5/17/2016	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/l				
440-147788	LWC 6.1-2-20160517	5/17/2016	SM2540C	TDS	Total Dissolved Solids	620		5.0	10	mg/l				
440-147788	LWC 6.3.1-20160517-FD	5/17/2016	E200.8	7440-47-3	Chromium	2.1		0.50	2.0	ug/l				
440-147788	LWC 6.3.1-20160517-FD	5/17/2016	E300	16887-00-6	Chloride	1700		2.5	250	mg/l				
440-147788	LWC 6.3.1-20160517-FD	5/17/2016	E300	24959-67-9	Bromide	2.5	U	2.5	5.0	mg/l				
440-147788	LWC 6.3.1-20160517-FD	5/17/2016	E300.1	14866-68-3	Chlorate	20	U	20	40	ug/l				
440-147788	LWC 6.3.1-20160517-FD	5/17/2016	E314.0	14797-73-0	Perchlorate	9.5	U	9.5	40	ug/l				
440-147788	LWC 6.3.1-20160517-FD	5/17/2016	SM2540C	TDS	Total Dissolved Solids	5100		5.0	100	mg/l				
440-147788	LWC 6.3-1-20160517	5/17/2016	E200.8	7440-47-3	Chromium	2.2		0.50	2.0	ug/l				
440-147788	LWC 6.3-1-20160517	5/17/2016	E300	16887-00-6	Chloride	1600		2.5	250	mg/l				
440-147788	LWC 6.3-1-20160517	5/17/2016	E300	24959-67-9	Bromide	3.3	J	2.5	5.0	mg/l	J	sp	Detect <PQL	-
440-147788	LWC 6.3-1-20160517	5/17/2016	E300.1	14866-68-3	Chlorate	20	U	20	40	ug/l				
440-147788	LWC 6.3-1-20160517	5/17/2016	E314.0	14797-73-0	Perchlorate	9.5	U	9.5	40	ug/l				
440-147788	LWC 6.3-1-20160517	5/17/2016	SM2540C	TDS	Total Dissolved Solids	5000		5.0	100	mg/l				
440-147944	LW6.85-20160518	5/18/2016	E200.8	7440-47-3	Chromium	0.53	J	0.50	2.0	ug/l	J	sp	Detect <PQL	-
440-147944	LW6.85-20160518	5/18/2016	E300	16887-00-6	Chloride	310		0.25	25	mg/l				
440-147944	LW6.85-20160518	5/18/2016	E300	24959-67-9	Bromide	0.83		0.25	0.50	mg/l				
440-147944	LW6.85-20160518	5/18/2016	E300.1	14866-68-3	Chlorate	180		50	100	ug/l				
440-147944	LW6.85-20160518	5/18/2016	E314.0	14797-73-0	Perchlorate	1.0	J	0.95	4.0	ug/l	J	sp	Detect <PQL	-

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SDG	Client Sample Identification	Sample Date	Method	Client Analyte Identification	Analyte	Laboratory Result	Laboratory Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code	Reason Code Definition	Qualification Finding
440-147944	LW6.85-20160518	5/18/2016	SM2540C	TDS	Total Dissolved Solids	1800		5.0	20	mg/l				
440-147944	LW7.2-20160518	5/18/2016	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/l				
440-147944	LW7.2-20160518	5/18/2016	E300	16887-00-6	Chloride	260		0.25	25	mg/l				
440-147944	LW7.2-20160518	5/18/2016	E300	24959-67-9	Bromide	0.67		0.25	0.50	mg/l				
440-147944	LW7.2-20160518	5/18/2016	E300.1	14866-68-3	Chlorate	210		50	100	ug/l				
440-147944	LW7.2-20160518	5/18/2016	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/l				
440-147944	LW7.2-20160518	5/18/2016	SM2540C	TDS	Total Dissolved Solids	1300		5.0	10	mg/l				

Notes:

- SDG Sample Designation Group
- J Estimated - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. It is not possible to assess the direction of the potential bias. The analyte was detected but the reported value may not be accurate or precise.
- U Nondetected - Analyses were performed for the compound or analyte, but it was not detected.
- UJ Estimated/Nondetected - The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- SQL sample quantitation limits
- PQL practical quantitation limit
- ug/l micrograms per liter
- mg/l milligrams per liter
- FD RPD field duplicate relative percent difference
- % percent
- %R percent recovery
- < less than
- > greater than

**Attachment A**

**Response to Comments**

# Memorandum

To	NDEP: Carlton Parker, J.D. Dotchin	Pages 6
CC	Harry Van Den Berg, Sally Bilodeau	
Subject	Response to Comments – Appendix E, Data Validation Summary Report, of the Surface Water and Seep Grab Sample Technical Memorandum for the NERT Remedial Investigation Downgradient Study Area, Nevada Environmental Response Trust Site, Henderson, Nevada	
From	AECOM: Carmen Schnell, Chad Roper, Lily Bayati, Steve Cole	
Date	June 29, 2017	

This memorandum summarizes our responses to comments received from NDEP (via email on March 7, 2017) on the Surface Water and Seep Grab Sample Technical Memorandum (Appendix E Data Validation Summary Report) for the NERT Remedial Investigation Downgradient Study Area, Nevada Environmental Response Trust Site, Henderson, Nevada. For context the portions of the text that the comments pertain to are shown in *italics*, where applicable. Proposed data validation text revisions are also presented in *italics*. These comments only affect Appendix E of the Technical Memorandum and, therefore, only Appendix E is being reissued.

**Comments in Document:**

**1. Table 4, Qualified Results**

**Comment NDEP1:** This table appears to contain all results and not just the qualified results. Please either edit the title of the table or the table contents.

**RTC 1:** The title of the table has been revised to “Analytical Results of Surface Water and Seep Sampling with Data Validation Qualifiers”.

**2. Section 1.0, Introduction (First Paragraph) – *The assessment was performed by AECOM under their April 7, 2016, Quality Assurance Project Plan (QAPP) and included the collection and analyses of 79 environmental and quality control (QC) samples.***

**Comment NDEP2:** The first paragraph of text indicates there were 79 samples; however, the EDD and Table 1 list 31 samples. Also, the number of samples validated at Stage 4 (second paragraph under the analyte/analyses bullet list) indicates there were 79 samples. Please correct these inconsistencies.

**RTC 2:** The reference to 79 samples is incorrect. There were 31 samples including field duplicates and field blanks. Text in section 1.0 (page 6) will be corrected for both total number of samples and number of samples validated per EPA stage 4.

**3. Section 1.1, Precision and Accuracy of Environmental Data (Definition List)**

**Comment NDEP3:** a. Text describing the “J” qualifier notes results are qualified as estimated when a blank exceedance is insufficient to cause result rejection. Current NDEP guidance on blank qualification only suggests estimating data based on blank results (not rejection). Please correct this inconsistency or add additional information to the blank corrective actions in Section 2.2.2, to support rejection of sample results due to blank detects.

b. In the last sentence of the definition of the “R” qualifier, redundant data are noted to be rejected. How is this different from the “DNR” qualifier?

c. The last sentence of the “DNR” qualifier appears to define another qualifier: “None.” Listing “None” in the “table” of qualifiers, gives the impression “None” is used as a qualifier. Please consider removing “None” from the “table” so it does not appear to be a qualifier and, if its description is considered necessary, add the discussion in a sentence underneath the “table.”

**RTC 3:**

a. The definition for the “J” qualifier will be corrected as follows:  
The associated numerical value is an estimated quantity. It is not possible to assess the direction of the potential bias. The analyte was detected but the reported value may not be accurate or precise.

For clarification, per NDEP guidance (1/5/2012) data is not rejected based on blank contamination.

b. The last sentence will be deleted, since redundant data will be qualified as “DNR” not “R”.

c. “None” is not a qualifier and will be removed from the list of qualifiers.

**4. Section 1.1, Precision and Accuracy of Environmental Data (Definition List)**

**Comment NDEP4:** The National Functional Guidelines (NFG) does not recognize the use of bias with the “UJ” qualifier. Please edit the discussion of this qualifier to comply with the NFG.

**RTC 4:** Definition for the “UJ” qualifier will be corrected as indicated in the NFG:

“The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.”

**5. Section 1.1, Precision and Accuracy of Environmental Data (Ninth Paragraph) –**

*Precision is a measure of the agreement or reproducibility of analytical results under a given set of conditions. It is a quantity that cannot be measured directly but is calculated from percent recovery data.*

**Comment NDEP5:** The equation for precision utilizes concentration but the text indicates percent recovery is used in the calculation of RPD. Please edit one or both for consistency.

**RTC 5:** The entire section for Precision and accuracy will be changed to the following:



*Precision measures the reproducibility of repetitive measurements. It is defined as the degree of mutual agreement among independent measurements as the result of repeated application of the sample analytical process under similar conditions.*

*Components of precision include analytical precision and total precision. Analytical precision is a measurement of the variability associated with duplicate or replicate analyses of the same sample in the laboratory, and is determined by analysis of laboratory quality control samples, such as duplicate control samples (LCSD or DCS), matrix spike duplicates (MSD), or sample duplicates. If the recoveries of analytes in the specified control samples are comparable within established control limits, then precision is within limits.*

*Total precision is a measurement of the variability associated with the entire sampling and analytical process. It is determined by analysis of duplicate or replicate field samples, and measures variability introduced by both the laboratory and field operations. Field duplicate samples are analyzed to assess field and analytical precision.*

*Duplicate results are assessed using the relative percent difference (RPD) between duplicate measurements. If the RPD for laboratory quality control samples exceeds the laboratory's statistically determined acceptance ranges, data will be qualified as described in the applicable validation procedure. If the RPD between primary and duplicate field samples exceeds 50 percent for groundwater, data will be qualified as described in the applicable validation procedure. The RPD will be calculated as follows:*

$$RPD = 200\% \times \frac{X_2 - X_1}{X_2 + X_1}$$

*where  $X_1$  is the smaller of the two observed values, and  $X_2$  is the larger of the two observed values.*

- 6. Section 1.1, Precision and Accuracy of Environmental Data (Twenty-Second Paragraph) – 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 were greater than the PQL and less than 10 times the blank contaminant value.**

**Comment NDEP6:**

- a. Should the underlined words be added to the following sentence? If so, please also make this correction in Section 2.2.2.

“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 were greater than the PQL and the sample result is less than 10 times the blank contaminant value.”

- b. The text indicates that results analyzed beyond 2x the holding time will be rejected. Are detects to be rejected or just nondetects? Please clarify.

**RTC 6:**

- a. The underlined words “*sample result*” will be added to this paragraph and Section 2.2.2 will be corrected.

b. Detected results are not rejected. Text will be revised.

7. **Section 2.0, Metals (First Paragraph)** – *A total of 25 water samples and seven QC samples were analyzed for dissolved chromium by EPA Method 200.8.*

**Comment NDEP7:** The text states there are 25 samples and 7 QC samples; however, the EDD and Table 1 have 24 samples and 3 QC samples (field duplicates). Please correct this discrepancy. If no EBs or FBs were analyzed, please include a discussion in Section 5.3 describing potential effects on comparability.

**RTC 7:** A total of 27 samples including three field duplicates were analyzed for dissolved chromium. The EBs and FBs were also analyzed for dissolved chrome. Text will be corrected.

8. **Section 2.1.6, FD Samples (First Paragraph)** – *The FDs were evaluated for acceptable precision with RPDs or difference in instances the results were less than five times the PQL for the compounds.*

**Comment NDEP8:** The first sentence of this section indicates that RPD is used for the metals field duplicate criterion only when results are less than 5x the PQL. The second sentence appears to state that criterion is used only when the results are less than the PQL. Please clarify.

**RTC 8:** RPDs were evaluated for all results. When the sample or field duplicate concentration was <PQL, the PQL was used for calculation purposes. Text will be corrected.

9. **Section 2.2.2, Blanks (Third Paragraph)** – *Results Below the PQL If a sample result and blank contaminant value were less than the PQL, the sample result was amended as non-detect (U) at the PQL.*

**Comment NDEP9:** The text states that “If a sample result and blank contaminant value were less than the PQL, the sample result was amended as non-detect (U) at the PQL.” NDEP guidance does not promulgate censoring results for potential blank contamination. Please correct the text.

**RTC 9:** Text will be corrected to reflect NFGs definition of the “U” qualifier.

10. **Section 2.2.2.2, EBs and FBs (First Paragraph)** – *Dissolved chromium was not detected in EBs and FBs.*

**Comment NDEP10:** The text states chromium was not detected in the EBs or FBs, but no EBs or FBs were analyzed for chromium. Please clarify and also check the statement in 3.2.2.2.

**RTC 10:** EBs and FBs were analyzed for dissolved chromium. Text will be corrected for 2.2.2.2 and 3.2.2.2.

11. **Section 3.0, Wet Chemistry (First Paragraph)** – *A total of 25 primary water samples and seven QCs were analyzed for hexavalent chromium by EPA Method 218.7; chloride and bromide by EPA Method 300.0; chlorate by EPA Method 300.1B; perchlorate by EPA Method 314.0; and TDS by Standard Method 2540C.*

**Comment NDEP11:** The text states there are 25 samples and 7 QC samples for all wet chemistry analytes. The EDD and Table 1 have 24 samples for all analytes, 7 QC samples for hexavalent chromium and 3 QC samples for the remaining wet chemistry analytes. Please correct this discrepancy. If no EBs or FBs were analyzed for some of the wet chemistry analytes, please include a discussion in Section 5.3 describing potential effects on comparability.

**RTC 11:** A total of 27 samples including three field duplicates were analyzed for wet chemistry parameters. In addition, two EBs and two FBs were analyzed. Text will be corrected.

A discussion will be included in section 5.3 describing the potential impact on comparability.

- 12. Section 5.2, Representativeness (First Paragraph) –** *All calibrations were performed as required and met the acceptance criteria. All surrogate, MS/MSD, duplicate, LCS, and FD percent recoveries and RPDs, met acceptance criteria with the exceptions noted in Sections 2.1.2, 3.1.3, and 3.1.6.*

**Comment NDEP12:** The text notes outliers requiring qualification in Sections 2.1.2, 3.1.3 and 3.1.6; however, no outliers were noted in Sections 2.1.2 and 3.1.3. Please correct the text in Section 5.2 or 2.1.2 and 3.1.3 as necessary.

**RTC 12:** Text will be corrected as follows:

*All calibrations were performed as required and met the acceptance criteria. All MS/MSD, LCS/LCSD and FD acceptance criteria were met.*

- 13. Section 5.3, Comparability (First Paragraph) –** *Sample integrity criteria were met. Sample preservation and holding times were within QC criteria with the exceptions noted in Section 3.2.1.*

**Comment NDEP13:** The text notes a sample preservation/holding time outlier requiring qualification in Section 3.2.1, however, no outlier was reported in this section. Please correct the text in Section 5.3 or 3.2.1 as necessary.

**RTC 13:** Section 5.3 will be revised to reflect section 3.2.1 as follows:

*Sample integrity criteria were met. Sample preservation and holding times were within QC criteria*

- 14. Section 5.4, Completeness (Table)**

**Comment NDEP14:** If changes were made to sample counts in Sections 2.0 and 3.0, please correct the table in Section 5.4.

**RTC 14:** Text will be revised to reflect the correct sample count.

## EDD Review

1. EDD

**Comment EDD1:** The validation\_flag field contains entries of “Yes”, but EDD guidance requires a T (true) or F (false).

Note: If the EDD requires revision due to DVSR comments, then please update the validation\_flag field as noted in EDD comment 1; otherwise the validation\_flag field can be updated from “Yes” to “T” when the EDD is uploaded to the database.

**RTC 1:** No revision to the EDD is required by the DVSR comments.

## **Attachment B**

### **Dissolved Chromium Data Validation**

## Dissolved Chromium by EPA Method 200.8

### I. Sample Receipt and Technical Holding Times

All samples were collected and preserved appropriately, and all analyses were performed within the method-specified holding times. All analyses were performed as requested on the chain of custody. The laboratory reported all requested analyses and the deliverable data reports were complete.

### II. Instrument Calibration

Appropriate Inductively Coupled Plasma (ICP)/Mass Spectrometry tune, initial calibration (IC), initial calibration verification (ICV), and continuing calibration verification (CCV) were performed as required by the method. All results were within QC limits and compliance requirements were met.

### III. Interference Check Sample (ICS) Analysis

ICS A and ICS AB solutions were analyzed at the proper frequency. All ICS results were within acceptance criteria.

### IV. Laboratory Blanks

Laboratory instrument blanks, calibration blanks and method blanks were analyzed at the proper frequency as required by the method. No contaminants were found in the laboratory blanks.

### V. Field Blanks

Samples LWC6.1-20160516-EB and LW6.7-20160517-EB were identified as equipment blanks. Chromium was not detected in the equipment blanks.

Samples LW3.1-20160516-FB and LW6.7-20160517-FB were identified as field blanks. Chromium was not detected in the field blanks.

### VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on associated project samples. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

### VII. Laboratory Duplicate Sample Analysis

Laboratory duplicate (DUP) analyses are not required by EPA Method 200.8 and therefore laboratory duplicate analyses were not performed for these SDGs.

### VIII. ICP Serial Dilution

ICP serial dilution is not applicable to EPA Method 200.8 and therefore serial dilutions of client samples were not performed for these SDGs.

### IX. Laboratory Control Samples

Laboratory control samples (LCS and LCSD) were prepared and analyzed the proper frequency as required by the method. Percent recoveries (%R) were within QC limits.

### X. Field Duplicates

Samples LW3.4-20160510-FD, KM71-20160516-FD, and LWC 6.3-1-20160517-FD were identified as field duplicates. Acceptable field and analytical precision was demonstrated for all field duplicate pairs. When the sample or field duplicate concentration is <RL, the RL is used for calculation purposes.

SDG	Sample ID	Primary Conc.	Duplicate Conc.	RPD	RPD Limit	Flags	A or P
440-147074	LWC3.4-20160510	ND <0.5 ug/L	ND <0.5 ug/L	NC	<30		
440-147639	KM71-20160516	ND <0.5 ug/L	ND <0.5 ug/L	NC	<30		
440-147788	LWC 6.3-1-20160517	2.2	2.1	5	<30		

## XI. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

## XII. Overall Assessment of Data

All samples were analyzed as requested and all holding times were met. No data were qualified. Overall, based on this data validation, the data as qualified are useable for meeting project objectives. All results are considered to be valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%. Additionally, because all samples in each data set were collected and analyzed under similar prescribed conditions, the data are considered to be comparable.

### May 2016 Surface Water Monitoring

**Dissolved Chromium – 440-147074-2, 440-147311-2, 440-147428-2, 440-147491-2, 440-147639-2, 4440-147788-2, 440-147944-2**

SDG	Client Sample ID	Analyte	Lab Result	Lab Qualifier	Units	Validator Qualifier	Reason Code Definition
440-147311	LW 3.75-20160511	Chromium	0.52	J	µg/L	J	Detect <PQL
440-147311	LW 3.8520160511	Chromium	0.51	J	µg/L	J	Detect <PQL
440-147311	LWC 4.1-20160511	Chromium	0.55	J	µg/L	J	Detect <PQL
440-147428	LW 4.95-20160512	Chromium	0.78	J	µg/L	J	Detect <PQL
440-147428	LWC 4.6-20160512	Chromium	0.62	J	µg/L	J	Detect <PQL
440-147491	LW5.3-20160513	Chromium	0.75	J	µg/L	J	Detect <PQL
440-147491	LW5.5-20160513	Chromium	1.4	J	µg/L	J	Detect <PQL
440-147491	LW5.7-20160513	Chromium	1.2	J	µg/L	J	Detect <PQL
440-147788	LWC 6.1-2-20160517	Chromium	0.61	J	µg/L	J	Detect <PQL
440-147944	LW6.85-20160518	Chromium	0.53	J	µg/L	J	Detect <PQL

No Sample Data Qualified in the following SDGs

### May 2016 Surface Water Monitoring

**Dissolved Chromium - 440-147074-2, 440-147639-2**

## **Attachment C**

### **Wet Chemistry Data Validation**



**Hexavalent Chromium by EPA Method 218.7**  
**Chloride and Bromide by EPA Method 300.0**  
**Chlorate by EPA Method 300.1B**  
**Perchlorate by EPA Method 314.0**  
**Total Dissolved Solids by Standard Method 2540C**

### **I. Sample Receipt and Technical Holding Times**

All samples were collected and preserved appropriately, and all analyses were performed within the method-specified holding times. All analyses were performed as requested on the chain of custody. The laboratory reported all requested analyses and the deliverable data reports were complete.

### **II. Instrument Calibration**

Initial and continuing calibrations were performed as required by the analytical method. All results were within QC limits and compliance requirements were met. The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

### **III. ICP Interference Check Sample (ICS) Analysis**

ICS analysis is not applicable for these methods.

### **IV. Laboratory Blanks**

Laboratory instrument blanks, calibration blanks and method blanks were analyzed at the proper frequency as required by the method. No contaminants were found in the laboratory blanks.

### **V. Field Blanks**

Samples LWC6.1-20160516-EB and LW6.7-20160517-EB were identified as equipment blanks. No contaminants were found in the equipment blanks.

Samples LW3.1-20160516-FB and LW6.7-20160517-FB were identified as field blanks. No contaminants were found in the field blanks.

### **VI. Surrogates**

Surrogates were added to all samples analyzed for chlorate by EPA Method 300.1B. All surrogate recoveries (%R) were within QC limits and no results were qualified.

### **VII. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on associated project samples. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

MS/MSD recovery limits do not apply when the sample concentration is  $\geq 4x$  the spike added. In such an event, the data was reported unflagged (*USEPA National Functional Guidelines*). In addition, batch or non-project MS/MSD data were not evaluated.

### **VIII. Duplicate Sample Analysis**

Duplicate (DUP) analyses were performed for Total Dissolved Solids by Standard Method 2540C. All duplicate analyses met criteria and therefore no samples were qualified based on duplicate analysis results.

## IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

## X. Field Duplicates

Samples LWC3.4-20160510-FD, KM71-20160516-FD, and LWC6.3-1-20160517-FD were identified as field duplicates. Acceptable field and analytical precision was demonstrated for all field duplicate pairs with the exception listed in the following table. When the sample or field duplicate concentration is <RL, the RL is used for calculation purposes.

SDG	Analyte	LWC3.4-20160510	FD	RPD	RPD Limit	Flags	A or P
440-147074	Chloride	300 mg/L	300 mg/L	0	<30%		
	Bromide	1.4 mg/L	0.97 mg/L	36%	<30%	J	A
	Chlorate	210 µg/L	220 µg/L	5%	<30%		
	Perchlorate	52 µg/L	56 µg/L	7%	<30%		
	TDS	1500 mg/L	1600 mg/L	6%	<30%		
16-3418	Hexavalent Chromium	ND <0.09 µg/L	ND <0.09 µg/L	NC	<30%		

SDG	Analyte	KM71-20160516	FD	RPD	RPD Limit	Flags	A or P
440-147639	Chloride	230 mg/L	230 mg/L	0	<30%		
	Bromide	1.3 mg/L	1.6 mg/L	21%	<30%		
	Chlorate	14 µg/L	14 µg/L	0	<30%		
	Perchlorate	1.4 µg/L	1.7 µg/L	19%	<30%		
	TDS	1400 mg/L	1400 mg/L	0	<30%		
16-3557	Hexavalent Chromium	ND <0.09 µg/L	ND <0.09 µg/L	NC	<30%		

SDG	Analyte	LWC6.3-1-20160517	FD	RPD	RPD Limit	Flags	A or P
440-147788	Chloride	1600 mg/L	1700 mg/L	6%	<30%		
	Bromide	3.3 mg/L	ND <5 mg/L	NC	<30%		
	Chlorate	ND <40 µg/L	ND <40 µg/L	NC	<30%		
	Perchlorate	ND <40 µg/L	ND <40 µg/L	NC	<30%		
	TDS	5000 mg/L	5100 mg/L	2%	<30%		
16-3595	Hexavalent Chromium	ND <0.09 µg/L	ND <0.09 µg/L	NC	<30%		

## XI. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

## XII. Overall Assessment of Data

All samples were analyzed as requested and all holding times were met. Due to field duplicate imprecision, the results for bromide for one field duplicate pair were qualified as estimated ("J"). No other data were qualified. Overall, based on this data validation, the data as qualified are useable for meeting project objectives. All results are considered to be valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%. Additionally, because all samples in each data set were collected and analyzed under similar prescribed conditions, the data are considered to be comparable.

**May 2016 Surface Water Monitoring****Wet Chemistry** – 16-3418, 16-3463, 16-3489, 16-3527, 16-3595, 16-3632, 440-147074-1, 440-147311-1, 440-147428-1, 440-147491-1, 440-147639-1, 440-147788-1, and 440-147944-1

SDG	Client Sample ID	Analyte	Lab Result	Lab Qualifier	Units	Validator Qualifier	Reason Code Definition
440-147074	LWC3.4-20160510	Bromide	1.4		mg/L	J	Field duplicate imprecision RPD>30
440-147074	LWC3.4-20160510-FD	Bromide	0.97		mg/L	J	Field duplicate imprecision RPD>30
440-147311	LW4.1-20160511	Bromide	0.38	J	mg/L	J	Detected <PQL
440-147311	LWC4.1-20160511	Bromide	0.36	J	mg/L	J	Detected <PQL
440-147639	KM-71-20160516	Chlorate	14	J	µg/L	J	Detected <PQL
440-147639	KM-71-20160516	Perchlorate	1.4	J	µg/L	J	Detected <PQL
440-147639	KM-71-20160516-FD	Chlorate	14	J	µg/L	J	Detected <PQL
440-147639	KM-71-20160516-FD	Perchlorate	1.7	J	µg/L	J	Detected <PQL
440-147639	LWC6.1-20160516	Perchlorate	1.7	J	µg/L	J	Detected <PQL
440-147788	KM-S-20160517	Bromide	0.63	J	mg/L	J	Detected <PQL
440-147788	LW6.7-20160517	Bromide	0.41	J	mg/L	J	Detected <PQL
440-147788	LWC6.3_1-20160517	Bromide	3.3	J	mg/L	J	Detected <PQL
440-147944	LW6.85-20160518	Perchlorate	1.0	J	µg/L	J	Detected <PQL

No Sample Data Qualified in the following SDGs

**May 2016 Surface Water Monitoring****Wet Chemistry** – 16-3418, 16-3463, 16-3489, 16-3527, 16-3595, 16-3632, 440-147428-1, and 440-147491-1