# DATA VALIDATION REPORT

September 2017 Groundwater Sampling Event
Four Corners Power Plant, Arizona Public Service
Farmington, New Mexico

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December 2017

Project No. 1420162024.2.2

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## ACRONYMS

| | |
|---|---|
| % | percent |
| Amec Foster Wheeler | Amec Foster Wheeler Environment & Infrastructure, Inc. |
| APS | Arizona Public Service |
| CCR | coal combustion residual |
| CLP | Contract Laboratory Program |
| COC | chain of custody |
| EPA | United States Environmental Protection Agency |
| ID | identification |
| LCS | laboratory control sample |
| LCSD | laboratory control sample |
| MCL | Maximum Contaminant Level |
| mg/L | milligrams per liter |
| MS | matrix spike |
| MSD | matrix spike duplicate |
| QC | quality control |
| RL | reporting limit |
| RPD | relative percent difference |
| SAP | sampling and analysis plan |
| SDG | sample delivery group |
| SM | Standard Method |
| SU | standard units (pH) |
| TestAmerica | TestAmerica Laboratories, Inc. |
| TDS | total dissolved solids |

# DATA VALIDATION REPORT

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Farmington, New Mexico

## 1.0 INTRODUCTION

Arizona Public Service (APS) collected 20 water samples, including two field duplicates, between September 9 and 11, 2017, from the Four Corners Power Plant, located in Farmington, New Mexico. APS submitted the samples to TestAmerica Laboratories, Inc. (TestAmerica) in Phoenix, Arizona. The samples were assigned to sample delivery groups (SDGs) J89579-1, J89579-2, and J89579-3. TestAmerica analyzed the samples for total metals and mercury by United States Environmental Protection Agency (EPA) Methods 200.7, 200.8, and 245.1; anions by EPA Method 300.0; total dissolved solids (TDS) by Standard Method (SM) 2540C; alkalinity by SM 2320B; and pH by SM 4500B. TestAmerica subcontracted the samples to Radiation Safety Engineering, Inc., where they were analyzed for radium 226/228 using GammaRay HPGE. A list of these samples by field sample identification (ID), sample collection date, and the laboratory sample ID is presented in Table 1.

## 2.0 DATA VALIDATION METHODOLOGY

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) performed an EPA Stage 2A validation on these samples, which is equivalent to a Level I data evaluation as defined in the project sampling and analysis plan (SAP). The Stage 2A validation includes review of the quality control (QC) results in the laboratory's analytical report and does not include review or validation of the raw analytical data. This data validation has been performed in general accordance with:

- AECOM, Inc., 2015. Final Sampling and Analysis Plan  Coal Combustion Residual (CCR) Groundwater Monitoring, Four Corners Power Plant, Arizona Public Service, Farmington, New Mexico, December 2015.
- EPA, 2004. SW 846 Test Methods for Evaluating Solid Wastes, Update IIIB.
- EPA, 2017. EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, EPA-540-R-2017-001.

The CLP guidelines were written specifically for the CLP, and have been modified for the purposes of this data review where they differ from method-specific QC requirements.

The laboratory's certified analytical report and supporting documentation were reviewed to assess the following:

- Data package and electronic data deliverable completeness;
- Chain of custody (COC) compliance;
- Holding time compliance;
- Presence or absence of laboratory contamination as demonstrated by laboratory blanks;
- Accuracy and bias as demonstrated by recovery of laboratory control sample (LCS) and matrix spike (MS) samples;
- Analytical precision as relative percent difference (RPD) of analyte concentration between laboratory duplicates, LCS/LCS duplicates (LCSDs), or MSs/MS duplicates (MSDs);
- Insofar as possible, the degree of conformance to method requirements and good laboratory practices.

In general, it is important to recognize that no analytical data are guaranteed to be correct, even if all QC audits are passed. Strict QC serves to increase confidence in data, but any reported value may potentially contain error.

## 3.0 EXPLANATION OF DATA QUALITY INDICATORS

Summary explanations of the specific data quality indicators reviewed during data validation are presented below.

### 3.1 LABORATORY CONTROL SAMPLE RECOVERIES

LCSs are aliquots of analyte free matrices that are spiked with the analytes of interest for an analytical method, or a representative subset of those analytes. The spiked matrix is then processed through the same analytical procedures as the samples it accompanies. LCS recovery is an indication of a laboratory’s ability to successfully perform an analytical method in an interference free matrix.

### 3.2 MATRIX SPIKE RECOVERIES

MSs and MSDs are prepared by adding known amounts of the analytes of interest for an analytical method, or a representative subset of those analytes, to an aliquot of sample. The spiked sample is then processed through the same extraction, concentration, cleanup, and analytical procedures as the unspiked samples in an analytical batch.

MS recovery and precision are an indication of a laboratory's ability to successfully recover an analyte in the matrix of a specific sample or closely related sample matrices. It is important not to apply MS results for any specific sample to other samples without understanding how the sample matrices are related.

## 3.3 BLANK CONCENTRATIONS

Blank samples are aliquots of analyte free matrix that are used as negative controls to verify that the sample collection, storage, preparation, and analysis system does not produce false positive results.

Laboratory blanks are processed by the laboratory using exactly the same procedures as the field samples. Target analytes should not be found in laboratory blanks.

When target analytes are detected in blanks, analyte concentrations in associated samples less than five times the concentration detected in the blank, or ten times the concentration for common laboratory contaminants, will be U qualified as being not detected.

## 3.4 LABORATORY DUPLICATES

Laboratory duplicate analysis verifies acceptable method precision by the laboratory at the time of preparation and analysis and/or sampling precision at the time of collection.

# 4.0 DEFINITIONS OF QUALIFIERS THAT MAY BE ADDED DURING DATA VALIDATION

**J** The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

**R** The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**U** The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

**UJ** The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

# 5.0 QUALIFICATION REASON CODE

The following reason code was applied to the data during data validation:

FD High RPD between field duplicate results.

HT Holding time exceeded.

# 6.0 CHAIN OF CUSTODY AND SAMPLE RECEIPT CONDITION DOCUMENTATION

The samples were received at the laboratories under proper COC, intact, properly preserved, and at temperatures less than the SAP-specified maximum of 6 degrees Celsius.

# 7.0 SPECIFIC DATA VALIDATION FINDINGS

Results from these samples may be considered usable with the limitations and exceptions described in Sections 7.1 through 8.0.

## 7.1 METALS BY EPA METHODS 200.7, 200.8, AND 245.1

Total metals and mercury results generated by TestAmerica may be considered usable with the limitations described in Sections 7.1.1 through 7.1.6.

### 7.1.1 Holding Times

All samples were analyzed for metals within the SAP-specified holding time of 28 days for mercury and 180 days for the additional metals.

### 7.1.2 Laboratory Blanks

Target analytes were not detected in the laboratory blanks associated with the analysis of these samples, with the following exceptions:

- Sodium was detected at a concentration of 1.69 milligrams per liter (mg/L) in the laboratory blank associated with the analysis of samples FC-CCR-MW7-91017, FC-CCR-MW49A-91017, FC-CCR-MW60-91017, FC-CCR-MW61-91017, FC-CCR-MW62-9917, FC-CCR-MW63-9917, FC-CCR-MW64-9917, FC-CCR-MW65-9917, FC-CCR-FD01-9917, FC-CCR-MW66-9917, FC-CCR-MW67-91017, FC-CCR-MW68-91017, FC-CCR-MW69-91017, FC-CCR-FD02-91017, FC-CCR-MW70-9917, FC-CCR-MW71-91117, FC-CCR-MW72-91017, FC-CCR-MW73-91017, FC-CCR-MW74-91017, and FC-CCR-MW75-91017, and the dilute analysis of sample

FC-CCR-MW49A-91017. Sodium was detected in all of these samples at concentrations more than five times the concentration detected in the blank and data usability is not adversely affected.

- Mercury was detected at a concentration of 0.000632 mg/L in the laboratory blank associated with the analysis of samples FC-CCR-MW49A-91017, FC-CCR-MW60-91017, FC-CCR-MW61-91017, FC-CCR-MW67-91017, FC-CCR-MW68-91017, FC-CCR-MW69-91017, FC-CCR-FD02-91017, FC-CCR-MW71-91117, FC-CCR-MW72-91017, FC-CCR-MW73-91017, FC-CCR-MW74-91017, and FC-CCR-MW75-91017. Mercury was not detected in these samples and data usability is not adversely affected.

### 7.1.3 Laboratory Control Sample Accuracy and Precision

LCS and LCSD recoveries were within the SAP-specified 80 to 120 percent (%) limits and RPDs between the LCS and LCSD results were less than the laboratory-specified maximum of 20%.

### 7.1.4 Matrix Spikes/Matrix Spike Duplicates

TestAmerica performed MS/MSD analysis on samples FC-CCR-MW7-91017 for beryllium, boron, calcium, lithium, magnesium, potassium, sodium, antimony, arsenic, barium, cadmium, chromium, cobalt, lead, molybdenum, selenium, thallium, and mercury; and FC-CCR-MW60-91017 for mercury. MS/MSD recoveries were within laboratory-specified limits, and RPDs between MS and MSD results were less than the laboratory-specified maximum of 20%, with the following exceptions:

- Calcium (61%, 48%), sodium (164%, 39%), and magnesium (35% MSD) recoveries were outside of laboratory limits in the MS and/or MSD performed on sample FC-CCR-MW7-91017. The calcium, magnesium and sodium concentrations detected in the unspiked native sample were more than four times the spike concentrations. Per CLP guidelines, it is not possible to evaluate data usability based on the MS/MSD performance of these analytes in sample FC-CCR-MW7-91017.

### 7.1.5 Analytical Sensitivity

Amec Foster Wheeler compared reporting limits (RLs) for antimony, arsenic, barium, beryllium, cadmium, chromium, selenium, thallium, lead and mercury against applicable National Primary Drinking Water Regulation Maximum Contaminant Levels (MCLs) to confirm that the RLs were sufficiently low to meet the MCLs. Non-detect results were reported at RLs less than the applicable MCLs.

Boron, calcium, cobalt, lithium, magnesium, molybdenum, potassium, and sodium are not EPA-regulated analytes in groundwater and it is not possible to evaluate the RLs for these analytes against Primary Drinking Water Regulation MCLs.

### 7.1.6 Data Reporting and Analytical Procedures

According to the laboratory, sodium was detected in the calibration blank associated with the analysis of samples FC-CCR-MW7-91017, FC-CCR-MW49A-91017, FC-CCR-MW60-91017, FC-CCR-MW61-91017, FC-CCR-MW62-9917, FC-CCR-MW63-9917, FC-CCR-MW64-9917, FC-CCR-MW65-9917, FC-CCR-FD01-9917, FC-CCR-MW66-9917, FC-CCR-MW67-91017, FC-CCR-MW68-91017, FC-CCR-MW69-91017, FC-CCR-FD02-91017, FC-CCR-MW70-9917, FC-CCR-MW71-91117, FC-CCR-MW72-91017, FC-CCR-MW73-91017, FC-CCR-MW74-91017, FC-CCR-MW75-91017, and the dilute analysis of FC-CCR-MW49A-91017, at a concentration equal to or greater than the RL. The laboratory reports that all samples associated with this CCB were either ND for sodium or contained sodium at a concentration greater than 10x the value found in the CCB and therefore data usability is not adversely affected.

According to the laboratory, an incorrect volume of spiking solution was added to the LCS/LCSD and MS/MSD associated with the mercury analysis of samples FC-CCR-MW7-91017, FC-CCR-MW62-9917, FC-CCR-MW63-9917, FC-CCR-MW64-9917, FC-CCR-MW65-9917, FC-CCR-FD01-9917, FC-CCR-MW66-9917, and FC-CCR-MW70-9917. The laboratory reported percent recoveries based on the amount spiked and data usability is not adversely affected.

## 7.2 ANIONS BY EPA METHOD 300.0

Fluoride, chloride, and sulfate results generated by TestAmerica may be considered fully usable without qualification.

### 7.2.1 Holding Times

Samples were analyzed for anions within the SAP-specified holding time of 28 days.

### 7.2.2 Laboratory Blanks

Fluoride, chloride, and sulfate were not detected in the laboratory blanks associated with the analysis of these samples.

### 7.2.3 Laboratory Control Samples

LCS and LCSD recoveries were within the laboratory-specified 90 to 110% limits and RPDs between the LCS and LCSD results were less than the laboratory-specified maximum values.

### 7.2.4 Matrix Spikes/Matrix Spike Duplicates

TestAmerica performed MS/MSD analysis on samples FC-CCR-MW7-91017 for fluoride, chloride and sulfate. MS/MSD recoveries were within laboratory-specified limits, and RPDs between MS and MSD results were less than the laboratory-specified maximum of 20%.

### 7.2.5 Laboratory Duplicates

TestAmerica did not perform duplicate analysis on any of the samples covered in this report.

### 7.2.6 Analytical Sensitivity

Amec Foster Wheeler compared RLs for fluoride against the MCL of 4 mg/L, and confirmed that the RLs were sufficiently low to meet the MCL.

Chloride and sulfate are not EPA-regulated analytes in groundwater and it is not possible to evaluate the RLs for these analytes against the Primary Drinking Water Regulation MCLs.

### 7.2.7 Data Reporting and Analytical Procedures

There were no data reporting or analytical issues with the data groups associated with this validation.

TestAmerica reported fluoride results for the same samples in SDG pairs J89579-1 and J89579-2. Each sample was analyzed for fluoride once and the same fluoride results are reported in both SDGs from each set.

## 7.3 TOTAL DISSOLVED SOLIDS BY SM 2540C

TDS results generated by TestAmerica may be considered fully usable without qualification.

### 7.3.1 Holding Times

All samples were analyzed for TDS within the SAP-specified holding time of 7 days.

### 7.3.2 Laboratory Blanks

TDS was not detected in the laboratory blanks at concentrations above the reporting limit.

### 7.3.3 Laboratory Control Sample Accuracy and Precision

LCS and LCSD recoveries were within the laboratory-specified 90 to 110% limits and RPDs between the LCS and LCSD results were less than the laboratory-specified maximum of 10%.

### 7.3.4 Laboratory Duplicates

TestAmerica performed duplicate analysis on samples FC-CCR-MW7-91017. RPDs between primary sample and laboratory duplicate results were less than the laboratory-specified 10% limit.

### 7.3.5 Data Reporting and Analytical Procedures

There were no data reporting or analytical issues with the data groups associated with this validation.

## 7.4 ALKALINITY BY SM 2320B

Alkalinity results generated by TestAmerica may be considered fully usable without qualification.

### 7.4.1 Holding Times

All samples were analyzed for alkalinity within the SAP specified holding time of 14 days.

### 7.4.2 Laboratory Blanks

Alkalinity was not detected in the laboratory blanks at concentrations above the reporting limit.

### 7.4.3 Laboratory Control Sample Accuracy

LCS and LCSD recoveries were within the laboratory-specified 90 to 110% limits and RPDs between the LCS and LCSD results were less than the laboratory-specified maximum of 20%.

### 7.4.4 Laboratory Duplicates

TestAmerica performed duplicate analysis for alkalinity on samples FC-CCR-MW7-91017, and FC-CCR-MW67-91017. RPDs between primary sample and laboratory duplicate results were less than the laboratory-specified maximum of 20%.

### 7.4.5 Data Reporting and Analytical Procedures

There were no data reporting or analytical issues with the data groups associated with this validation.

## 7.5 PH BY SM 4500B

pH results generated by TestAmerica may be considered usable with the limitations described in Sections 7.5.1 through 7.5.4.

### 7.5.1 Holding Times

All samples were analyzed for pH after the method-specified 15 minute hold time had passed. Amec Foster Wheeler J qualified the pH results from these samples because of holding time exceedance. (J-HT)

### 7.5.2 Laboratory Control Sample Accuracy

LCS recovery was within the laboratory-specified 98.5 to 101.5% limits.

### 7.5.3 Laboratory Duplicates

TestAmerica performed duplicate analysis for pH on samples FC-CCR-MW7-91017, FC-CCR-MW64-9917, and FC-CCR-MW70-9917. RPDs between primary sample and laboratory duplicate results were less than the laboratory-specified maximum of 5%.

### 7.5.4 Data Reporting and Analytical Procedures

There were no data anomalies associated with the pH analysis of these samples.

## 7.6 RADIOCHEMICAL ANALYSES

It was not possible to evaluate data usability for the radiochemical analyses due to a lack of reported laboratory QC.

### 7.6.1 Analytical Sensitivity

Amec Foster Wheeler compared RLs for total radium analysis against the MCL to confirm that the RLs were sufficiently low to meet the MCL. Non-detect results were reported to RLs less than the applicable MCL.

# 8.0 FIELD DUPLICATES

APS collected samples FC-CCR-FD01-9917 (FC-CCR-MW65-9917), and FC-CCR-FD02-91017 (FC-CCR-MW69-91017) as field duplicates and original samples, respectively. Target analyte detections are summarized in Table 2. Precision values were less than the SAP-specified maximum of 20%, or the differences between the detected concentrations were less than the RLs, with the exceptions listed below.

- Lead was detected in sample FC-CCR-MW69-91017 at a concentration of 0.0060 mg/L, but lead was not detected in its field duplicate FC-CCR-FD02-91017 at a concentration greater than the RL of 0.0020 mg/L. The difference between the detected result and the RL was

greater than the RL and Amec Foster Wheeler J qualified the detected and UJ qualified the non-detect lead results from these two samples due to potential sampling and/or analytical imprecision. (J/UJ-FD)

## 9.0 SUMMARY AND CONCLUSIONS

Amec Foster Wheeler reviewed 560 data records from field samples during this validation. All of the data generated are usable and of acceptable quality with the addition of qualifiers presented in Table 3. Qualifier definitions are summarized in Section 4.0, reason codes are summarized in Section 5.0, and qualified data are summarized below.

- Amec Foster Wheeler J or UJ qualified 22 records (3.9%) as being estimated concentrations due to hold time exceedances and high RPDs between original samples and field duplicates.

The data should be considered valid with the addition of the qualifiers presented in Table 3.

## REFERENCES

AECOM, 2015. Sampling and Analysis Plan CCR Groundwater Monitoring Four Corners Power Plant Arizona Public Service, Farmington, New Mexico, December 2015.

EPA, 2017. EPA CLP National Functional Guidelines for Inorganic Superfund Data Review, EPA-540-R-2017-001.

EPA, 2004. SW 846 Test Methods for Evaluating Solid Wastes, Update IIIB.

## LIMITATIONS

This report was prepared exclusively for Arizona Public Service by Amec Foster Wheeler Environment & Infrastructure, Inc. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in Amec Foster Wheeler services and based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This data validation report is intended to be used by Arizona Public Service, Four Corners Power Plant site only, subject to the terms and conditions of its contract with Amec Foster Wheeler. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

# TABLES

# TABLE 1
## Field Samples Submitted to Test America Laboratories, Inc.
## Four Corners Power Plant, Arizona Public Service
## Farmington, New Mexico
## September 2017 Data

| Field Sample ID | Collection Date | Test America Sample ID | Notes |
|---|---|---|---|
| FC-CCR-MW7-91017 | 9/10/2017 | 550-89579-1 | |
| FC-CCR-MW49A-91017 | 9/10/2017 | 550-89579-2 | |
| FC-CCR-MW60-91017 | 9/10/2017 | 550-89579-3 | |
| FC-CCR-MW61-91017 | 9/10/2017 | 550-89579-4 | |
| FC-CCR-MW62-9917 | 9/9/2017 | 550-89579-5 | |
| FC-CCR-MW63-9917 | 9/9/2017 | 550-89579-6 | |
| FC-CCR-MW64-9917 | 9/9/2017 | 550-89579-7 | |
| FC-CCR-MW65-9917 | 9/9/2017 | 550-89579-8 | |
| FC-CCR-FD01-9917 | 9/9/2017 | 550-89579-9 | Field duplicate of sample FC-CCR-MW65-9917 |
| FC-CCR-MW66-9917 | 9/9/2017 | 550-89579-10 | |
| FC-CCR-MW67-91017 | 9/10/2017 | 550-89579-11 | |
| FC-CCR-MW68-91017 | 9/10/2017 | 550-89579-12 | |
| FC-CCR-MW69-91017 | 9/10/2017 | 550-89579-13 | |
| FC-CCR-FD02-91017 | 9/10/2017 | 550-89579-14 | Field duplicate of sample FC-CCR-MW69-91017 |
| FC-CCR-MW70-9917 | 9/9/2017 | 550-89579-15 | |
| FC-CCR-MW71-91117 | 9/11/2017 | 550-89579-16 | |
| FC-CCR-MW72-91017 | 9/10/2017 | 550-89579-17 | |
| FC-CCR-MW73-91017 | 9/10/2017 | 550-89579-18 | |
| FC-CCR-MW74-91017 | 9/10/2017 | 550-89579-19 | |
| FC-CCR-MW75-91017 | 9/10/2017 | 550-89579-20 | |

**Notes:**
ID = identification

# TABLE 2
## Field Duplicate Detections
## Four Corners Power Plant, Arizona Public Service
## Farmington, New Mexico
## September 2017 Data

| Analyte | RL | Primary Sample Result | Field Duplicate Result | RPD | Notes |
|---|---|---|---|---|---|
| **FC-CCR-FD01-9917 and FC-CCR-MW65-9917** | | | | | |
| Chloride | 2.0 mg/L | 53 | 54 | 1.9% | |
| Fluoride | 0.40 mg/L | 2.0 | 2.0 | 0.0% | |
| Sulfate | 40 mg/L | 450 | 450 | 0.0% | |
| Barium | 0.0020 mg/L | 0.012 | 0.011 | 8.7% | |
| Boron | 0.050 mg/L | 0.80 | 0.81 | 1.2% | |
| Calcium | 2.0 mg/L | 110 | 110 | 0.0% | |
| Magnesium | 2.0 mg/L | 59 | 60 | 1.7% | |
| Molybdenum | 0.0020 mg/L | 0.0080 | 0.0081 | 1.2% | |
| Potassium | 0.50 mg/L | 3.4 | 3.5 | 2.9% | |
| Sodium | 0.50 mg/L | 140 | 140 | 0.0% | |
| Alkalinity as CaCO3 | 6.0 mg/L | 320 | 320 | 0.0% | |
| Bicarbonate Alkalinity as CaCO3 | 6.0 mg/L | 320 | 320 | 0.0% | |
| Total Dissolved Solids | 20 mg/L | 1,000 | 1,000 | 0.0% | |
| pH | 1.7 SU | 7.5 | 7.5 | 0.0% | |
| **FC-CCR-FD02-91017 and FC-CCR-MW69-91017** | | | | | |
| Chloride | 400 mg/L | 1,600 | 1,600 | 0.0% | |
| Fluoride | 2.0 mg/L | 20 | 20 | 0.0% | |
| Sulfate | 400 mg/L | 13,000 | 13,000 | 0.0% | |
| Arsenic | 0.0020 mg/L | 0.0073 | 0.0075 | 2.7% | |
| Barium | 0.0020 mg/L | 0.018 | 0.018 | 0.0% | |
| Boron | 0.25 mg/L | 150 | 150 | 0.0% | |
| Calcium | 2.0 mg/L | 490 | 480 | 2.1% | |
| Cobalt | 0.0020 mg/L | 0.0043 | 0.0044 | 2.3% | |
| Lead | 0.0020 mg/L | 0.0060 | 0.0020 U | NC | J/UJ-FD |
| Lithium | 0.20 mg/L | 0.46 | 0.46 | 0.0% | |
| Magnesium | 10 mg/L | 2,700 | 2,800 | 3.6% | |
| Molybdenum | 0.0020 mg/L | 0.016 | 0.017 | 6.1% | |
| Potassium | 0.50 mg/L | 46 | 45 | 2.2% | |
| Selenium | 0.0020 mg/L | 0.014 | 0.013 | 7.4% | |
| Sodium | 0.50 mg/L | 720 | 720 | 0.0% | |
| Alkalinity as CaCO3 | 6.0 mg/L | 340 | 340 | 0.0% | |
| Bicarbonate Alkalinity as CaCO3 | 6.0 mg/L | 340 | 340 | 0.0% | |
| Total Dissolved Solids | 550 mg/L | 18,000 | 20,000 | 11% | |
| pH | 1.7 SU | 7.5 | 7.5 | 0.0% | |

**Notes:**

CaCO3 = calcium carbonate
RL = reporting limit
mg/L = milligrams per liter
RPD = relative percent difference
NC = not calculable
SU=standard units

**Qualifier Definitions:**

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

**Reason Codes:**

±RL = the difference between the detected concentrations was less than the reporting limit

FD = High relative percent difference between field duplicate results

# TABLE 3
## Qualifiers Added During Data Validation
## Four Corners Power Plant, Arizona Public Service
## Farmington, New Mexico
## September 2017 Data

| Sample IDs | Analytes | Concentrations | Qualifiers and Reason Codes |
|---|---|---|---|
| FC-CCR-FD01-9917 | pH | 7.5 SU | J HT |
| FC-CCR-FD02-91017 | Lead | 0.0020 mg/L | UJ FD |
| FC-CCR-FD02-91017 | pH | 7.5 SU | J HT |
| FC-CCR-MW49A-91017 | pH | 7.4 SU | J HT |
| FC-CCR-MW60-91017 | pH | 7.6 SU | J HT |
| FC-CCR-MW61-91017 | pH | 8.7 SU | J HT |
| FC-CCR-MW62-9917 | pH | 6.8 SU | J HT |
| FC-CCR-MW63-9917 | pH | 7.0 SU | J HT |
| FC-CCR-MW64-9917 | pH | 7.8 SU | J HT |
| FC-CCR-MW65-9917 | pH | 7.5 SU | J HT |
| FC-CCR-MW66-9917 | pH | 7.3 SU | J HT |
| FC-CCR-MW67-91017 | pH | 7.3 SU | J HT |
| FC-CCR-MW68-91017 | pH | 7.0 SU | J HT |
| FC-CCR-MW69-91017 | Lead | 0.0060 mg/L | J FD |
| FC-CCR-MW69-91017 | pH | 7.5 SU | J HT |
| FC-CCR-MW70-9917 | pH | 7.0 SU | J HT |
| FC-CCR-MW71-91117 | pH | 7.1 SU | J HT |
| FC-CCR-MW72-91017 | pH | 7.0 SU | J HT |
| FC-CCR-MW73-91017 | pH | 7.0 SU | J HT |
| FC-CCR-MW74-91017 | pH | 7.7 SU | J HT |
| FC-CCR-MW75-91017 | pH | 8.4 SU | J HT |
| FC-CCR-MW7-91017 | pH | 7.5 SU | J HT |

**Notes:**
mg/L = milligrams per liter
SU = standard units

**Qualifier Definitions:**
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

**Reason Codes:**
FD = High relative percent difference between field duplicate results
HT = Holding time exceeded