# DATA VALIDATION REPORT

June 2016 Groundwater Sampling Event
Four Corners Power Plant, Arizona Public Service
Farmington, New Mexico

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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 |
| SM | Standard Method |

# DATA VALIDATION REPORT
Four Corners Power Plant, Arizona Public Service
Farmington, New Mexico

## 1.0 INTRODUCTION

Arizona Public Service (APS) collected 18 water samples (including one field blank and one field duplicates) between June 5 and 7, 2016, from Four Corners Power Plant, located in Farmington, New Mexico. APS submitted the samples to Test America Laboratories, Inc. (TestAmerica), located in Phoenix, Arizona, where they were assigned to sample delivery group 550-64612. Test America analyzed the samples for total metals 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; and pH by SM 4500B. Test America subcontracted the samples to Radiation Safety Engineering, Inc., where they were analyzed for radium 226/228 using Gamma Ray HPGE. A list of these samples by field sample identification (ID), sample collection date, and the laboratory sample IDs 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 report also does not include review or validation of the data from Radiation Safety Engineering, Inc. due to the lack of QC 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, 2014. EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, EPA-540 R 013 001.

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 or MSs/MS duplicates (MSDs);
- Sampling and analytical precision as RPD of analyte concentration between field duplicates;
- Assessment of field contamination as demonstrated by field blanks; and
- 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 they accompany. 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 will be U qualified as being not detected.

## 3.4 LABORATORY AND FIELD DUPLICATES

Laboratory and field 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 CODES

The following reason codes were applied to the data during data validation:

FD Field duplicate RPD exceeded established criteria.

HB Potentially high analytical bias.

HT Holding time exceeded.

RB Analyte was detected in the associated field blank and the concentrations detected in the sample was less than five times the concentration detected in the blank.

## 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, with the following exception:

- TestAmerica noted that samples FC-CCR-DUP-616 and FC-CCR-EQB-616 were submitted for analysis, but were not listed on the COC. The samples were logged in and analyzed for all of the parameters referenced on the COC.

## 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 Test America may be considered usable with the limitations described in Sections 7.1.1 through 7.1.7.

### 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.

### 7.1.3 Field Blank

Target analytes were not detected in the field blank, with the following exception:

- Lead was detected at a concentration of 0.00071 milligrams per liter (mg/L) in the field blank associated with the samples collected during this event. Data limitations are summarized below.
  - Amec Foster Wheeler U qualified the detected lead results from samples FC-CCR-MW7-616 (0.00082 mg/L), FC-CCR-MW8-616 (0.0014 mg/L), FC-CCR-MW60-616 (0.0021 mg/L), FC-CCR-MW61-616 (0.00080 mg/L), and FC-CCR-MW71-616 (0.00073 mg/L) because the concentrations detected in the samples were less than five times the concentration detected in the blank. (U-RB)
  - Lead was not detected in the remaining samples and data usability is not adversely affected by the blank detection.

### 7.1.4 Laboratory Control Samples

LCS recoveries were within the SAP-specified 80 to 120 percent (%) limits.

### 7.1.5 Matrix Spikes/Matrix Spike Duplicates

Test America performed MS and MSD analyses on project sample FC-CCR-MW66-616 for mercury. MS/MSD recoveries were within the SAP-specified limits and RPDs between MS and MSD results were less than the SAP-specified maximum of 20%.

MS and MSD analyses for the other metals were performed on samples from an unrelated project and recovery and precision data are not applicable to the APS samples.

### 7.1.6 Analytical Sensitivity

Amec Foster Wheeler compared RLs (reporting limits) for antimony, arsenic, barium, beryllium, cadmium, chromium, selenium, thallium, and mercury against the National Primary Drinking Water

Maximum Contaminant Levels (MCLs) to confirm that the RLs were sufficiently low to meet the MCLs. Nondetected results were reported to RLs less than the applicable MCLs.

### 7.1.7 Data Reporting and Analytical Procedures

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

## 7.2 ANIONS BY EPA METHOD 300.0

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

### 7.2.1 Holding Times

All 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 Field Blank

Fluoride, chloride, and sulfate were not detected in the field blank at concentrations above the reporting limit.

### 7.2.4 Laboratory Control Samples

LCS and LCS duplicate (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.

### 7.2.5 Matrix Spikes/Matrix Spike Duplicates

Test America performed MS and MSD analyses on equipment blank FC-CCR-EQB-616 for fluoride and sample FC-CCR-MW67-616 for sulfate. Recoveries were within the laboratory-specified 80 to 120% limits and RPDs between MS and MSD results were less than 20%.

### 7.2.6 Laboratory Duplicates

Test America did not perform duplicate analyses of any of the samples covered in this report and it is not possible to evaluate data usability based on duplicate precision of unrelated samples.

### 7.2.7 Analytical Sensitivity

Amec Foster Wheeler compared RLs for fluoride against the MCL to confirm that the RLs were sufficiently low to meet the MCL. Nondetected results were reported to RLs less than the applicable MCL.

### 7.2.8 Data Reporting and Analytical Procedures

There were no data anomalies associated with the fluoride, chloride, and sulfate analysis of these samples.

## 7.3 TOTAL DISSOLVED SOLIDS BY SM 2540C

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

### 7.3.1 Holding Times

All samples were analyzed for TDS within the EPA-recommended 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 Field Blank

TDS was not detected in the field blank at a concentration above the reporting limit.

### 7.3.4 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 values.

### 7.3.5 Laboratory Duplicates

Test America performed a duplicate analysis on equipment blank FC-CCR-EQB-616. RPD between source and duplicate result was less than laboratory-specified maximum of 10%.

### 7.3.6 Data Reporting and Analytical Procedures

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

## 7.4 PH BY SM 4500B

pH results generated by Test America may be considered usable with the limitations described in Sections 7.4.1 through 7.4.4.

### 7.4.1 Holding Times

The laboratory noted that pH analysis was completed after the 15 minute hold time had expired. The samples were collected on June 5, 6 and 7, 2016, but the samples were not analyzed for pH until June 9, 2016. Amec Foster Wheeler J qualified the pH results from the associated samples because of the missed hold times. (J-HT)

### 7.4.2 Laboratory Control Sample Accuracy

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

### 7.4.3 Laboratory Duplicates

Test America performed duplicate analyses on samples FC-CCR-MW61-616 and FC-CCR-MW71-616. RPDs between source and duplicate results were less than laboratory-specified maximum of 5%.

### 7.4.4 Data Reporting and Analytical Procedures

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

## 7.5 RADIOCHEMICAL ANALYSES

It was not possible to evaluate data usability for the radiochemical analyses, except for field blank detections, due to a lack of laboratory QC.

### 7.5.1 Field Blank

Radium 226 and total radium were both detected at concentrations of 0.7 picoCuries per liter in the field blank associated with these samples. Data limitations are summarized below.

- Amec Foster Wheeler U qualified all detected radium 226 results from the associated samples because the concentrations detected in the samples were less than five times the concentration detected in the blank. (U-RB)
- Amec Foster Wheeler J qualified the detected total radium results, excluding the results from samples FC-CCR-MW8-616 and FC-CCR-MW62-616, to indicate the results may be biased high due to uncertainty with the radium 226 results. (J-HB)
- Radium 226 was not detected in samples FC-CCR-MW8-616 and FC-CCR-MW62-616. In Amec Foster wheeler's professional opinion, data usability is not adversely affected.

### 7.5.2 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. Nondetected results were reported to RLs less than the applicable MCL.

## 8.0 FIELD DUPLICATES

A field duplicate was collected with sample FC-CCR-MW70-616 (FC-CCR-DUP-616). 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 following exceptions:

- RPDs between radium 228 and total radium results from sample FC-CCR-MW70-616 and its field duplicate FC-CCR-DUP-616 were high at 59% and 42%, respectively. Amec Foster Wheeler J qualified the detected radium 228 and total radium results from these samples because of potential sampling or analytical imprecision. (J-FD)

## 9.0 SUMMARY AND CONCLUSIONS

Amec Foster Wheeler reviewed 330 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 qualified 30 records (7.1%) as being estimated concentrations because of hold time exceedances, potentially high analytical bias, and/or field duplicate imprecision.
- Amec Foster Wheeler U qualified 16 records (4.8%) as being not detected because of analyte detections in the associated field blank.

No records were rejected and 100% of the data should be considered valid with the addition of the qualifiers presented in Table 3.

## REFERENCES

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

EPA, 2014. EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, EPA-540 R 013 001.

## 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

| Field Sample ID | Collection Date | Test America Sample ID | Notes |
|---|---|---|---|
| FC-CCR-MW7-616 | 6/6/2016 | 550-64612-1/19 | |
| FC-CCR-MW8-616 | 6/7/2016 | 550-64612-2/20 | |
| FC-CCR-MW49A-616 | 6/7/2016 | 550-64612-3/21 | |
| FC-CCR-MW60-616 | 6/6/2016 | 550-64612-4/22 | |
| FC-CCR-MW61-616 | 6/6/2016 | 550-64612-5/23 | |
| FC-CCR-MW62-616 | 6/5/2016 | 550-64612-6/24 | |
| FC-CCR-MW63-616 | 6/5/2016 | 550-64612-7/25 | |
| FC-CCR-MW64-616 | 6/5/2016 | 550-64612-8/26 | |
| FC-CCR-MW65-616 | 6/5/2016 | 550-64612-9/27 | |
| FC-CCR-MW66-616 | 6/5/2016 | 550-64612-10/28 | |
| FC-CCR-MW67-616 | 6/6/2016 | 550-64612-11/29 | |
| FC-CCR-MW68-616 | 6/5/2016 | 550-64612-12/30 | |
| FC-CCR-MW69-616 | 6/6/2016 | 550-64612-13/31 | |
| FC-CCR-MW70-616 | 6/5/2016 | 550-64612-14/32 | |
| FC-CCR-MW71-616 | 6/6/2016 | 550-64612-15/33 | |
| FC-CCR-MW72-616 | 6/6/2016 | 550-64612-16/34 | |
| FC-CCR-DUP-616 | 6/6/2016 | 550-64612-17/35 | Field duplicate of FC-CCR-MW70-616 |
| FC-CCR-EQB-616 | 6/5/2016 | 550-64612-18/36 | Field blank |

**Notes:**
ID = identification

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

| Analyte | RL | Primary Concentration | Field Duplicate Concentration | RPD | Notes |
|---|---|---|---|---|---|
| **Samples FC-CCR-MW70-616 and FC-CCR-DUP-616** | | | | | |
| Fluoride[1] | 0.40 mg/L | 2.1 | 2.2 | 4.7% | |
| Fluoride[2] | 0.40 mg/L | 2.2 | 2.1 | 4.7% | |
| Chloride | 40 mg/L | 1,200 | 1,100 | 8.7% | |
| Sulfate | 400 mg/L | 6,300 | 6,300 | 0.0% | |
| Lithium | 0.20 mg/L | 0.31 | 0.32 | 3.2% | |
| Calcium | 2.0 mg/L | 480 | 480 | 0.0% | |
| Boron | 0.50 mg/L | 89 | 89 | 0.0% | |
| Antimony | 0.00010 mg/L | 0.00011 | 0.00011 | 0.0% | |
| Arsenic | 0.00050 mg/L | 0.0048 | 0.0044 | 8.7% | |
| Barium | 0.00050 mg/L | 0.012 | 0.013 | 8.0% | |
| Chromium | 0.00050 mg/L | 0.00063 | 0.00084 | 29% | ± RL |
| Cobalt | 0.00050 mg/L | 0.0051 | 0.0051 | 0.0% | |
| Molybdenum | 0.00050 mg/L | 0.0060 | 0.0060 | 0.0% | |
| Selenium | 0.00050 mg/L | 0.170 | 0.160 | 6.1% | |
| Thallium | 0.00010 mg/L | 0.00028 | 0.00027 | 3.6% | |
| Total Dissolved Solids | 100 mg/L | 12,000 | 12,000 | 0.0% | |
| pH | -- pH units | 6.97 J | 6.94 J | 0.4% | |
| Radium 226 | 0.4 pCi/L | 0.5 | 0.6 | 18% | |
| Radium 228 | 0.8 pCi/L | 2.4 | 1.3 | 59% | J-FD |
| Total Radium | 0.8 pCi/L | 2.9 | 1.9 | 42% | J-FD |

**Notes:**
mg/L = milligrams per liter
LOQ = limit of quantification
pCi/L = picoCuries per liter
RPD = relative percent difference
[1] Sample analysis associated with TestAmerica sample ID 550-64612-14 (source) and 550-64615-17 (field duplicate)
[2] Sample analysis associated with TestAmerica sample ID 550-64612-32 (source) and 550-64615-35 (field duplicate)

**Qualifier and Reason Code Definitions:**
FD = Field duplicate RPD exceeded established criteria
± RL = The difference between analyte concentrations is less than the reporting limit, demonstrating acceptable sampling and/or analytical precision.
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

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

| Sample IDs | Methods | Analytes | Concentrations | Qualifiers and Reason Codes |
|---|---|---|---|---|
| FC-CCR-MW7-616 | SM 4500B | pH | 7.23 pH units | J HT |
| | EPA 200.8 | Lead | 0.00082 mg/L | U RB |
| | EPA 903.1 | Radium 226 | 0.9 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 3.3 pCi/L | J HB |
| FC-CCR-MW8-616 | SM 4500B | pH | 7.03 pH units | J HT |
| | EPA 200.8 | Lead | 0.0014 mg/L | U RB |
| FC-CCR-MW49A-616 | SM 4500B | pH | 7.44 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.6 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 2.4 pCi/L | J HB |
| FC-CCR-MW60-616 | SM 4500B | pH | 7.12 pH units | J HT |
| | EPA 200.8 | Lead | 0.0021 mg/L | U RB |
| | EPA 903.1 | Radium 226 | 0.8 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 0.8 pCi/L | J HB |
| FC-CCR-MW61-616 | SM 4500B | pH | 8.62 pH units | J HT |
| | EPA 200.8 | Lead | 0.00080 mg/L | U RB |
| FC-CCR-MW62-616 | SM 4500B | pH | 6.86 pH units | J HT |
| FC-CCR-MW63-616 | SM 4500B | pH | 7.05 pH units | J HT |
| FC-CCR-MW64-616 | SM 4500B | pH | 7.66 pH units | J HT |
| FC-CCR-MW65-616 | SM 4500B | pH | 7.41 pH units | J HT |
| FC-CCR-MW66-616 | SM 4500B | pH | 7.61 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.6 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 1.7 pCi/L | J HB |
| FC-CCR-MW67-616 | SM 4500B | pH | 7.27 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.8 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 2.0 pCi/L | J HB |
| FC-CCR-MW68-616 | SM 4500B | pH | 7.05 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.8 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 2.9 pCi/L | J HB |
| FC-CCR-MW69-616 | SM 4500B | pH | 7.47 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.8 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 3.2 pCi/L | J HB |
| FC-CCR-MW70-616 | SM 4500B | pH | 6.97 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.5 pCi/L | U RB |
| | EPA 904.0 | Radium 228 | 2.4 pCi/L | J FD |
| | EPA 903.1/904.0 | Total Radium | 2.9 pCi/L | J FD, HB |
| FC-CCR-MW71-616 | SM 4500B | pH | 6.87 pH units | J HT |
| | EPA 200.8 | Lead | 0.00073 mg/L | U RB |
| | EPA 903.1 | Radium 226 | 1.1 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 3.2 pCi/L | J HB |
| FC-CCR-MW72-616 | SM 4500B | pH | 6.99 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.5 pCi/L | U RB |
| | EPA 903.1/904.0 | Total Radium | 1.3 pCi/L | J HB |
| FC-CCR-DUP-616 | SM 4500B | pH | 6.94 pH units | J HT |
| | EPA 903.1 | Radium 226 | 0.6 pCi/L | U RB |
| | 903.1/904 | Radium 228 | 1.3 pCi/L | J FD |
| | 903.1/904 | Total Radium | 1.9 pCi/L | J FD, HB |

**Notes:**
mg/L = milligrams per liter
pCi/L = picoCuries per liter

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

**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.

**Reason Codes:**

HB = Potentially high analytical bias.

HT = Holding time exceeded

FD = Field duplicate relative percent difference exceeded established criteria

RB = Analyte was detected in the associated field blank and the concentrations detected in the sample was less than five times the concentration detected in the blank.