Data Review Memorandum

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Action **Info** **File**

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From: Marianne Burrus, QA/QC

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Subject : APS Four Corner's Power Plant (FCPP) - Coal Combustion Residual (CCR)

This report summarizes the review of analytical data for the two aqueous samples and one field duplicate collected at the APS FCPP as a part of the CCR groundwater monitoring program. The sample identification numbers, sample collection dates, and analyses are summarized in Table 1. The samples were analyzed by Test America (TA) located in North Canton, Ohio.

The data were reviewed in accordance with the quality assurance and control (QA/QC) objectives outlined in the project document: *Sampling and Analysis Plan* [SAP], *Coal Combustion Residual (CCR) Groundwater Monitoring, Four Corners Power Plant, Arizona Public Service, Farmington, New Mexico* (December 2015). The following comments refer to the performance of the laboratory in meeting the QA/QC specifications outlined in the project document and analytical methods and the criteria specified in the EPA document: *National Functional Guidelines for Superfund Inorganic Methods Data Review* (October 2013). The qualifiers and reason codes used to identify data that did not meet the criteria set forth in the previously referenced documents are listed in Appendix A.

A list of the data review parameters is given in Sections 1.0 through 3.0. A preceding "►" signifies areas where issues were raised during the course of the validation review, and should be considered to determine any impact on data quality and usability.

Executive Summary

The data are acceptable in all areas of review and are useable for their intended purpose with qualifications summarized below.

Sample ID	Analyte	Probable Bias Direction	Qualifier, Reason Code	Reference Section
FC-CCR-MW-71-030516 FC-CCR-FD-2-030516	Beryllium	Unknown	J,f/UJ,f	1.6
	Cadmium	Unknown	J,f/J,f	1.6
	Chromium	Unknown	J,f/J,f	1.6
	Lead	Unknown	J,f/J,f	1.6
	Antimony	Unknown	J,f/UJ,f	1.6

Because none of the results was rejected the analytical completeness for this data group is 100%.

1.0 Methods 200.8 and 245.1

Data Completeness
Preservation and Holding Times
Blanks
Matrix Spike/Matrix Spike Duplicates
Laboratory Control Sample
►Field Duplicate
Sample Quantitation

1.1 Data Completeness

The analyses were performed as requested on the chain-of-custody (COC) records and in accordance with the SAP.

1.2 Preservation and Holding Times

The samples were adequately preserved and were analyzed within the method specified holding time. Therefore, data qualification was not necessary.

1.3 Blanks

The following analytes were detected in the method blank and the associated samples were qualified as noted.

Blank ID	Analyte	Qualified Sample	Qualifier, Reason Code
240-220945/1-A	Barium	None	None
	Calcium	None	None
	Nickel	None	None
	Magnesium	None	None
	Potassium	None	None
	Sodium	None	None
None Associated sample concentrations were >5x the blank contamination level; therefore, no qualification of the data was considered necessary.			

1.4 Matrix Spike/ Matrix Spike Duplicates (MS/MSD)

The MS/MSD analyses was not performed on a sample from this project, therefore, matrix effect could not be evaluated.

1.5 Laboratory Control Sample (LCS)

The LCS percent recoveries were within the control limits. Therefore, data qualification was not necessary.

1.6 Field Duplicate

The field duplicate for this sampling event was collected at location FC-CCR-MW-71-030516 and was assigned field sample identification FC-CCR-FD-2-030516. With the following exceptions, the RPD values were within the control limits.

Analyte	Primary/FD Result (mg/L)	RPD Value Criteria = 20%	Qualifier, Reason Code
Beryllium	0.00064 / 0.0010	44%	J,f/UJ,f
Cadmium	0.00019 / 0.00010	62%	J,f/J,f
Chromium	0.00078 / 0.00054	36%	J,f/J,f
Lead	0.00061 / 0.00021	98%	J,f/J,f
Antimony	0.00016 / 0.0020	170%	J,f/UJ,f

1.7 Sample Quantitation

The values for some of the analytes were reported at levels between the method detection limit (MDL) and the laboratory reporting limit (RL). In these instances, the laboratory reported these values as estimated (with a "J" qualifier). Because the laboratory RLs were reported below the project action levels, no further qualification of this data was considered necessary.

2.0 Methods 300.0 and 353.2

Data Completeness
Preservation and Holding Times
Blanks
Matrix Spike/Matrix Spike Duplicates
Laboratory Control Sample
Field Duplicate

2.1 Data Completeness

The analyses were performed as requested on the COC records and in accordance with the SAP.

2.2 Preservation and Holding Times

TA recorded the temperature upon receipt to be 1.1°C; however, no samples were noted as being frozen. Although the recorded temperature is outside the acceptable range of 4°C ± 2 °C, this slight deviation from the acceptable temperature range is not considered likely to adversely affect the quality of the analytical results. The samples were analyzed within the method specified holding time Therefore, data qualification was not necessary.

2.3 Blanks

The associated method blanks were reported as non-detect for all target analytes.

2.4 Matrix Spike/ Matrix Spike Duplicates (MS/MSD)

The MS/MSD analyses was not performed on a sample from this project, therefore, matrix effect could not be evaluated

2.5 Laboratory Control Sample (LCS)

The LCS percent recoveries were within the control limits. Therefore, data qualification was not necessary.

2.6 Field Duplicate

The field duplicate for this sampling event was collected at location FC-CCR-MW-71-030516 and was assigned field sample identification FC-CCR-FD-2-030516. No significant differences were noted for the field duplicate pair, indicating acceptable field precision.

3.0 Methods SM2540C and SM2320B

Data Completeness
Preservation and Holding Times
Blanks
Matrix Spike/Matrix Spike Duplicates
Laboratory Control Sample
Field Duplicate

3.1 Data Completeness

The analyses were performed as requested on the COC records and in accordance with the SAP.

3.2 Preservation and Holding Times

TA recorded the temperature upon receipt to be 1.1°C; however, no samples were noted as being frozen. Although the recorded temperature is outside the acceptable range of 4°C ± 2 °C, this slight deviation from the acceptable temperature range is not considered likely to adversely affect the quality of the analytical results. The samples were analyzed within the method specified holding time Therefore, data qualification was not necessary.

3.3 Blanks

The associated method blanks were reported as non-detect for all target analytes.

3.4 Matrix Spike/ Matrix Spike Duplicates (MS/MSD)

The MS/MSD analyses was not performed on a sample from this project, therefore, matrix effect could not be evaluated

3.5 Laboratory Control Sample (LCS)

The LCS percent recoveries were within the control limits. Therefore, data qualification was not necessary.

3.6 Field Duplicate

The field duplicate for this sampling event was collected at location FC-CCR-MW-71-030516 and was assigned field sample identification FC-CCR-FD-2-030516. No significant differences were noted for the field duplicate pairs, indicating acceptable field precision.

APPENDIX A
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY ASSIGNED BY AECOM'S DATA REVIEW TEAM

DATA QUALIFIER DEFINITIONS

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

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

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

R The sample results are 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.

REASON CODE DEFINITIONS

a Analytical sequence deficiency or omission.
b Gross compound breakdown (4,4'-DDT/Endrin).
c Calibration failure; poor or unstable response.
d Laboratory duplicate imprecision.
e Laboratory duplicate control sample imprecision.
f Field duplicate imprecision.
g Poor chromatography.
h Holding time violation.
i Internal standard failure.
j Poor mass spectrographic performance.
k Serial dilution imprecision.
l Laboratory control sample recovery failure.
m Matrix spike/matrix spike duplicate recovery failure.
n Interference check sample recovery failure.
o Calibration blank contamination (metals/inorganics only).
p Preparation blank contamination (metals/inorganics only).
q Quantitation outside of linear range.
r Linearity failure in initial calibration.
s Surrogate spike recovery failure (organics only).
t Instrument tuning failure.
u No confirmation column present (GC organics only).
w Retention time (RT) outside of RT window.
x Equipment blank contamination.
y Trip blank contamination.
z Method blank contamination.
Q Other

TABLE 1

Consultant: AECOM

Project: APS FCPP – CCR

Laboratory: Test America

Field Sample Identification	Laboratory Identification Number	Sample Date	Method 200.8*	Method 245.1 (Mercury)	Method 300.0 (Chloride, fluoride, sulfate)	Method 353.2 (Nitrate/nitrite)	Method SM2540C (Total dissolved solids)	Method 2320B (Alkalinity and carbonate/bicarbonate)
FC-CCR-MW-71-030516	240-61853-1	3/5/16	X	X	X	X	X	X
FC-CCR-FD-2-030516 (field duplicate of MW-71)	240-61853-2	3/5/16	X	X	X	X	X	X
FC-CCR-MW72-030716	240-61853-3	3/7/16	X	X	X	X	X	X

Antimony, arsenic, barium, beryllium, boron, calcium, cadmium, chromium, cobalt, lead, lithium, magnesium, molybdenum, selenium, thallium, sodium, potassium, and nickel