

American Electric Power

UMWA Postretirement Health Care Plan

**Actuarial Valuation Report
Postretirement Welfare Cost for Fiscal Year Ending
December 31, 2017, under U.S. GAAP**

May 2017

WillisTowersWatson 

This report is confidential and intended solely for the information and benefit of the immediate recipient thereof. It may not be distributed to a third party unless expressly allowed under the "Purpose and Actuarial Certification" section herein.

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Purpose and actuarial statement

Purposes of valuation

American Electric Power retained Towers Watson Delaware Inc. (“Willis Towers Watson”), to perform an actuarial valuation of its postretirement welfare programs for the purpose of determining the following:

- (1) The value of benefit obligations as of January 1, 2017 and American Electric Power’s postretirement welfare cost for fiscal year ending December 31, 2017 in accordance with FASB Accounting Standards Codification Topic 715 (ASC 715-60). It is anticipated that a separate report will be prepared for year-end financial reporting and disclosure purposes.
- (2) Plan reporting information in accordance with FASB Accounting Standards Codification Topic 965 (ASC 965).

Limitations

This valuation has been conducted for the purposes described above and may not be suitable for any other purpose. In particular, please note the following:

1. There may be certain events that have occurred since the valuation date that are not reflected in the current valuation.
2. This report does not provide information for plan reporting under ASC 965.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices. However, please note the information discussed below regarding this valuation.

Reliances

In preparing the results presented in this report, we have relied upon information regarding plan provisions, participants, claims data, contributions and assets (if any) provided by American Electric Power and other persons or organizations designated by American Electric Power. We have reviewed this information for overall reasonableness and consistency, but have neither audited nor independently verified this information. Based on discussions with and concurrence by the plan sponsor, assumptions or estimates may have been made if data were not available. We are not aware of any errors or omissions in the data that would have a significant effect on the results of our calculations.

We have relied on all the information provided as complete and accurate. The results presented in this report are dependent upon the accuracy and completeness of the underlying data and information. Any material inaccuracy in the data and information provided to us may have produced results that are not suitable for the purposes of this report and such inaccuracies, as corrected by American Electric Power, may produce materially different results that could require that a revised report be issued.

Effects of Health Care Legislation

In March 2010, the Patient Protection and Affordable Care Act (PPACA) and Health Care and Education Reconciliation Act (HCERA) were enacted. The key aspects of the Acts affecting American Electric Power's benefit obligation and cost of providing retiree medical benefits are:

- Mandatory coverage for adult children until age 26 beginning in 2011
- Loss of the tax free status of the Retiree Drug Subsidy (RDS) beginning in 2013
- Excise ("Cadillac Plan") tax on high-cost plans beginning in 2020

All subsequent measurements for tax purposes reflect current law.

This valuation reflects our understanding of the relevant provisions of PPACA and HCERA. The IRS and HHS have yet to issue final guidance with respect to many aspects of this law. It is possible that future guidance may conflict with our understanding of these laws based on currently available guidance and could therefore affect the results shown in this report.

Assumptions and methods under U.S. GAAP

As required by U.S. GAAP, the actuarial assumptions and methods employed in the development of the other postretirement benefit cost and other financial reporting have been selected by the Company. Willis Towers Watson has concurred with these assumptions and methods except for the expected return on plan assets selected for fiscal 2017. Evaluation of the expected rate of return assumption was outside the scope of Willis Towers Watson's assignment and would have required substantial additional work that we were not engaged to perform. U.S. GAAP requires that each significant assumption "individually represent the best estimate of a particular future event."

The results shown in this report have been developed based on actuarial assumptions that, to the extent evaluated by Willis Towers Watson, we consider to be reasonable. Other actuarial assumptions could also be considered to be reasonable. Thus, reasonable results differing from those presented in this report could have been developed by selecting different reasonable assumptions.

A summary of the assumptions and methods used is provided in Appendix A. Note that any subsequent changes in methods or assumptions for the October 31, 2016 measurement date will change the results shown in this report.

Nature of actuarial calculations

The results shown in this report have been developed based on actuarial assumptions that, to the extent evaluated or selected by Willis Towers Watson, we consider to be reasonable. Other actuarial assumptions could also be considered to be reasonable. Thus, reasonable results differing from those presented in this report could have been developed by selecting different reasonable assumptions. The results shown in this report are estimates based on data that may be imperfect and on assumptions about future events that cannot be predicted with certainty. The effects of certain plan provisions may be approximated, or determined to be insignificant and therefore not valued. Assumptions may be made, in consultation with American Electric Power about participant data or other factors. Reasonable efforts were made in preparing this valuation to confirm that items that are significant in the context of the actuarial liabilities or costs are treated appropriately, and are not

excluded or included inappropriately. The numbers shown in this report are not rounded. This is for convenience only and should not imply precision; by their nature, actuarial calculations are not precise.

If overall future plan experience produces higher (lower) benefit payments or lower (higher) investment returns than assumed, the relative level of plan costs or contribution requirements reported in this valuation will likely increase (decline) in future valuations. Future actuarial measurements may differ significantly from the current measurements presented in this report due to many factors, including: plan experience differing from that anticipated by the economic or demographic assumptions; increases or reductions expected as part of the natural operation of the methodology used for the measurements (such as the end of an amortization period); and changes in plan provisions or applicable law. It is beyond the scope of this valuation to analyze the potential range of future postretirement welfare contributions, but we can do so upon request.

See Basis for Valuation in Section 1 above for a discussion of any material events that have occurred after the valuation date that are not reflected in this valuation.

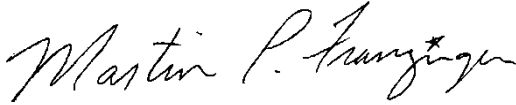
Limitations on use

This report is provided subject to the terms set out herein and in our master consulting services agreement dated July 29, 2004, and any accompanying or referenced terms and conditions.

The information contained in this report was prepared for the internal use of American Electric Power and its auditors in connection with our actuarial valuation of the postretirement welfare plan as described in Purposes of Valuation above. It is not intended for and may not be used for other purposes, and we accept no responsibility or liability in this regard. American Electric Power may distribute this actuarial valuation report to the appropriate authorities who have the legal right to require American Electric Power to provide them this report, in which case American Electric Power will use best efforts to notify Willis Towers Watson in advance of this distribution. Further distribution to, or use by, other parties of all or part of this report is expressly prohibited without Willis Towers Watson's prior written consent. Willis Towers Watson accepts no responsibility for any consequences arising from any other party relying on this report or any advice relating to its contents.

Professional qualifications

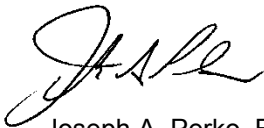
The undersigned consulting actuaries are members of the Society of Actuaries and meet the “Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States” relating to postretirement welfare plans. Our objectivity is not impaired by any relationship between American Electric Power and our employer, Towers Watson Delaware Inc.



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The Pricing Specialist is responsible for developing and/or determining the reasonableness of retiree welfare plan trend and participation assumptions as well as assumed per capita claims costs (including the aging/morbidity assumption, if applicable). The Valuation Actuary is responsible for other aspects of the valuation (e.g., developing and/or reviewing the reasonableness of other valuation assumptions and methods, ensuring that the valuation model reasonably reflects the substantive plan and actual plan operation, preparing demographic data, performing the valuation, implementing the correct accounting or funding calculations, etc.).

Towers Watson Delaware Inc.

May 2017

Section 1: Summary of key results

Benefit cost, assets & obligations

All monetary amounts shown in US Dollars

Fiscal Year Beginning		January 1, 2017	January 1, 2016
Benefit Cost/ (Income)	Net Periodic Postretirement Benefit Cost/(Income)	2,928,032	3,614,265
Measurement Date		January 1, 2017	January 1, 2016
Plan Assets	Fair Value of Assets (FVA)	31,414,235	28,974,149
Benefit Obligations	Accumulated Postretirement Benefit Obligation (APBO)	85,221,031	86,004,651
Funded Status	Funded Status	(53,806,796)	(57,030,502)
Accumulated Other Comprehensive (Income)/Loss	Net Transition Obligation/(Asset)	0	0
	Net Prior Service Cost/(Credit)	0	0
	Net Loss/(Gain)	18,264,322	20,428,103
	Total Accumulated Other Comprehensive (Income)/Loss	18,264,322	20,428,103
Assumptions¹	Discount Rate	4.10%	4.30%
	Expected Long-term Return on Plan Assets	6.75%	7.00%
	Current Health Care Cost Trend Rate	6.75%	7.00%
	Ultimate Health Care Cost Trend Rate	5.00%	5.00%
	Year of Ultimate Trend Rate	2024	2024
Participant Data	Census Date	January 1, 2017	January 1, 2016
Plan reporting (ASC 965) for Plan Year Beginning		January 1, 2017	January 1, 2016
	Present value of accumulated benefits	91,833,261	92,805,203
	Market value of assets	31,414,235	28,974,149
	Plan reporting discount rate	4.10%	4.30%
Employer Contributions (net of Medicare subsidy)		Plan Year 2017	Plan Year 2016
Cash Flow	Expected benefit payments and expenses net of participant contributions (excluding Cook Coal) and cash contributions (Cook Coal only)	3,725,886	4,327,412

Employer Contributions

Employer contributions are the amounts paid by American Electric Power to provide for postretirement benefits, net of participant contributions and Medicare subsidy for non-Cook Coal locations plus the Net Periodic Benefit Cost for Cook Coal.

American Electric Power's funding policy for non-Cook Coal locations is to pay claims costs for the year and administrative expenses, less participant contributions and any Medicare Part D subsidy (RDS) received. For Cook Coal, the funding policy is to contribute an amount equal to the postretirement welfare cost plus retiree drug subsidy payments received (the sum of which can be no

¹ Rates are expressed on an annual basis where applicable.

less than zero). We understand the sponsor may deviate from this policy, as permitted by its terms, based on cash, tax or other considerations.

Postretirement welfare cost and funded position

The cost of the postretirement welfare plan is determined in accordance with generally accepted accounting principles in the U.S. ("U.S. GAAP"). The fiscal 2017 postretirement welfare benefit cost for the plan is \$2,928,032. Under U.S. GAAP, the funded position (fair value of plan assets less the projected benefit obligation, or "APBO") of each postretirement welfare plan at the plan sponsor's fiscal year-end (measurement date) is required to be reported as a liability. The APBO is the actuarial present value of benefits attributed to service rendered prior to the measurement date, taking into consideration expected future pay increases for pay-related plans. The plan's overfunded (underfunded) APBO as of January 1, 2017, was \$(53,806,796), based on the fair value of plan assets of \$31,414,235 and the APBO of \$85,221,031.

Fiscal year-end financial reporting information and disclosures are prepared before detailed participant data and full valuation results are available. Therefore, the postretirement benefit asset (liability) at December 31, 2016, was derived from a roll forward of the January 1, 2016 valuation results, adjusted for the year-end discount rate and asset values, as well as significant changes in plan provisions and participant population. The current fiscal year-end financial reporting information will be developed based on the results of the January 1, 2017 valuation, projected to the end of the year and similarly adjusted for the year-end discount rate and asset values, as well as significant changes in plan provisions and participant population.

Change in postretirement welfare cost

The postretirement welfare cost decreased from \$3,614,265 in fiscal 2016 to \$2,928,032 in fiscal 2017, as set forth below:

All monetary amounts shown in US Dollars

(\$ in millions)	Postretirement welfare cost
Prior year	3.6
Change due to:	
▶ Expected based on prior valuation and contributions during prior year	(0.1)
▶ Unexpected noninvestment experience	(0.6)
▶ Unexpected investment experience	0.0
▶ Assumption changes	0.0
▶ Changes in substantive plan	0.0
Current year	2.9

Significant reasons for these changes include the following:

- The discount rate decreased by 20 basis points compared to the prior year which increased the postretirement welfare cost.
- Claims experience was favorable (lower than expected) which was reflected in lower per capita claims cost assumptions and decreased the postretirement welfare cost.

- Demographic experience was favourable due to a decrease in active participants, which decreased the postretirement welfare cost.
- The expected return on asset assumption was decreased from 7.00% to 6.75%, which increased postretirement welfare cost.

Basis for valuation

Appendix A summarizes the assumptions and methods used in the valuation. Appendix B summarizes our understanding of the principal provisions of the plan being valued.

Changes in Assumptions

The following assumptions were revised for the 2017 valuation: discount rate, per capita claims costs, excise tax and expected return on assets.

Changes in Methods

None.

Changes in Benefits Valued

None.

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Section 2: Accounting exhibits

2.1 Balance sheet asset/(liability)

All monetary amounts shown in US Dollars

Measurement Date	January 1, 2017	January 1, 2016
A Development of Balance Sheet Asset/(Liability)¹		
1 Accumulated postretirement benefit obligation (APBO)	85,221,031	86,004,651
2 Fair value of assets (FVA)	31,414,235	28,974,149
3 Net balance sheet asset/(liability)	(53,806,796)	(57,030,502)
B Current and Noncurrent Allocation		
1 Noncurrent assets	0	0
2 Current liabilities	(3,009,846)	(3,075,749)
3 Noncurrent liabilities	(50,796,950)	(53,954,753)
4 Net balance sheet asset/(liability)	(53,806,796)	(57,030,502)
C Accumulated Other Comprehensive (Income)/Loss		
1 Net transition obligation/(asset)	0	0
2 Net prior service cost/(credit)	0	0
3 Net loss/(gain)	18,264,322	20,428,103
4 Accumulated other comprehensive (income)/loss ²	18,264,322	20,428,103
D Assumptions and Dates³		
1 Discount rate	4.10%	4.30%
2 Current health care cost trend rate	6.75%	7.00%
3 Ultimate health care cost trend rate	5.00%	5.00%
4 Year of ultimate trend rate	2024	2024
5 Census date	January 1, 2017	January 1, 2016

¹ Whether the amounts in this table that differ from those disclosed at year-end must be disclosed in subsequent interim financial statements should be determined.

² Amount shown is pre-tax and should be adjusted by plan sponsor for tax effects.

³ Rates are expressed on an annual basis where applicable.

2.2 Summary and comparison of postretirement benefit cost and cash flows

All monetary amounts shown in US Dollars

Fiscal Year Ending	December 31, 2017	December 31, 2016
A Total Postretirement Benefit Cost		
1 Employer service cost	853,575	1,121,865
2 Interest cost	3,447,442	3,661,876
3 Expected return on assets	(2,110,641)	(2,040,314)
4 Subtotal	2,190,376	2,743,427
5 Transition obligation/(asset) amortization	0	0
6 Net prior service cost/(credit) amortization	0	0
7 Net loss/(gain) amortization	737,656	870,838
8 Amortization subtotal	737,656	870,838
9 Net periodic postretirement benefit cost/(income)	2,928,032	3,614,265
B Assumptions¹		
1 Discount rate	4.10%	4.30%
2 Current health care cost trend rate	6.75%	7.00%
3 Ultimate health care cost trend rate	5.00%	5.00%
4 Year ultimate trend rate is expected	2024	2024
C Census Date	January 1, 2017	January 1, 2016
D Assets at Beginning of Year		
1 Fair market value	0	0
E Cash Flow		
	Expected	Actual
1 Employer contributions ²	3,725,886	4,900,616
2 Plan participants' contributions	0	0
3 Benefits paid by the Employer ³	3,245,926	3,557,966
4 Benefits paid from plan assets ³	1,039,781	678,059
5 Expected Medicare subsidy	(264,019)	(253,550)

¹ These assumptions were used to calculate the Net Postretirement Benefit Cost/ (Income) as of the beginning of the year. Rates are expressed on an annual basis where applicable. For assumptions used for interim measurement periods, if any, refer to Appendix A.

² Reflects benefit payments and expenses (non-Cook Coal), as well as contributions to plan trust (Cook Coal), net of RDS.

³ Amounts shown are prior to offset for Medicare subsidy.

2.3 Detailed results for postretirement welfare cost and funded position

All monetary amounts shown in US Dollars

Detailed results	January 1, 2017	January 1, 2016
A Service Cost		
1 Medical	853,575	1,121,865
B Accumulated Postretirement Benefit Obligation [APBO]		
1 Medical:		
a Participants currently receiving benefits	65,110,491	62,531,319
b Fully eligible active participants	8,542,750	10,079,461
c Other participants	11,567,790	13,393,871
d Total	85,221,031	86,004,651
C Assets		
1 Fair value [FV]	31,414,235	28,974,149
D Funded Position		
1 Overfunded (underfunded) APBO	(53,806,796)	(57,030,502)
E Amounts in Accumulated Other Comprehensive Income		
1 Transition obligation/(asset)	0	0
2 Net prior service cost/(credit)	0	0
3 Net loss/(gain)	18,264,322	20,428,103
4 Total	18,264,322	20,428,103
F Effect of Change in Health Care Cost Trend Rate		
1 One-percentage-point increase:		
a Sum of service cost and interest cost	895,471	1,040,345
b APBO	13,666,327	14,153,753
2 One-percentage-point decrease:		
a Sum of service cost and interest cost	(681,844)	(785,754)
b APBO	(10,874,796)	(11,201,476)

2.4 Expected benefit disbursements, administrative expenses and participant contributions

All monetary amounts shown in US Dollars

	January 1, 2017	January 1, 2016
A Medical		
1 Gross disbursements	4,285,707	4,244,946
2 Participant contributions	0	0
3 Net disbursements	4,285,707	4,244,946
B RDS		
1 Gross disbursements	(264,019)	(269,879)
2 Participant contributions	0	0
3 Net disbursements	(264,019)	(269,879)
C Total		
1 Gross disbursements	4,021,688	3,975,067
2 Participant contributions	0	0
3 Net disbursements	4,021,688	3,975,067

Section 3: Data exhibits

3.1 Plan participant data

All monetary amounts shown in US Dollars

Census Date	January 1, 2017	January 1, 2016
A Participating Employees		
1 Number		
a Fully eligible	14	17
b Other	21	29
c Total participating employees	35	46
2 Average age	48.7	47.5
3 Average credited service	21.1	19.6
4 Average future working life		
a to expected retirement age	13.2	13.6
b to full eligibility age	5.7	7.2
B Retirees and Surviving Spouses		
1 Retirees and surviving spouses		
a Number under 65	43	42
b Number 65 and older	208	217
c Total	251	259
d Number with married/family health care coverage	105	113
e Number with single health care coverage	146	146
f Average age	76.3	76.6
g Age Distribution at January 1, 2017		
	Age	Number
	Under 55	1
	55-59	10
	60-64	32
	65-69	36
	70-74	42
	75-79	26
	80-84	41
	85 and over	63

C Dependents

1	Number	105	113
2	Average age	68.5	69.4
3	Age Distribution at January 1, 2017		

Age	Number
Under 55	5
55-59	14
60-64	23
65-69	25
70-74	11
75-79	12
80-84	8
85 and over	7

Participant data was supplied by the AEP as of the census date.

3.2 Age and service distribution of participating employees

Attained Age	Attained Years of Credited Service and Number								Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	
Under 25									
25-29									
30-34			2						2
35-39		1	5	1					7
40-44			3	3					6
45-49		1	2	1	1				5
50-54			1	1	1				3
55-59				1		1		4	6
60-64				1			1	4	6
65-69									
70 & over									
Total	0	2	13	8	2	1	1	8	35¹
Average:	Age:	48.7	Number of Participants:		Fully eligible	14	Males	35	
	Service	21.1			Other	21	Females	0	
Census data as of January 1, 2017									

¹ Ages and service totals for purposes of determining category are based on exact (not rounded) values.

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Appendix A: Statement of actuarial assumptions and methods

Economic Assumptions

Discount rate		4.10 %
Medical cost trend rate	2017	6.75
	2018	6.50
	2019	6.25
	2020	6.00
	2021	5.75
	2022	5.50
	2023	5.25
	2024+	5.00

Demographic Assumptions

Mortality Based on modified versions of RP-2014 with long-term improvement rates of 0.75%.

Base mortality rates are derived from the RP-2014 mortality table with improvements factored to 2006 with blue collar adjustment.

Mortality improvements are projected forward on a generational basis. Improvement rates grade linearly from the MP-2014 rate in 2007 to the ultimate rate in 2015:

Age	Ultimate Improvement rate per year	Age	Ultimate improvement rate per year
85 and younger	0.750%	91	0.300%
86	0.675%	92	0.225%
87	0.600%	93	0.150%
88	0.525%	94	0.075%
89	0.450%	95 and older	0.000%
90	0.375%		

Disability Rates vary by age as indicated by the following sample values:

Age	Rate
20	0.120%
30	0.120
40	0.147
50	0.357
60	1.380

Termination

Rates vary by age as indicated by the following sample values

Age	Rate
20	10.70%
30	5.9
40	2.1
≥45	0

Retirement

Rates vary by age as indicated by the following values:

Age	Rate	Age	Rate
55	6.0%	61	10.0%
56	6.5	62	12.0
57	7.0	63	15.0
58	7.5	64	20.0
59	8.0	65	50.0
60	9.0	66 – 69	30.0
		70	100.0

Percent married

95%

Spouses ages

Wives three years younger than husbands.

Participation rates

<i>Employees</i>	<i>Dependent</i>
100%	100%

2017 Per Capita Claims Costs

Basis for Per Capita
Claim Cost
Assumptions

	Age	Post-1993 retirees	Pre-1994 retirees	Medicare Part D RDS Subsidy
▶ Overall average	< 65	17,055	17,452	N/A
	>=65	10,369	10,369	(974)
▶ By age group	< 35	7,391	7,563	N/A
	35-49	7,956	8,141	N/A
	40-44	8,848	9,054	N/A
	45-49	10,299	10,539	N/A
	50-54	12,657	12,952	N/A
	55-59	15,245	15,599	N/A
	60-64	18,721	19,157	N/A
	65-69	9,194	9,194	(932)
	70-74	10,189	10,189	(1,012)
	75-79	10,909	10,909	(1,045)
	80-84	11,126	11,126	(1,035)
	85-89	10,851	10,851	(966)
90-94	9,824	9,824	(834)	
>= 95	8,545	8,545	(670)	

Administrative expenses \$435 per primary participant in 2017, increasing 3.5% per year.

Excise tax payments as a percentage of per capita claims costs for sample years	Year	% Load
	2018	0%
	2020	3.7%
	2025	7.1%
	2030	10.1%
	2035	12.8%
	2040	15.3%
	2050	19.6%

Methods – Postretirement Welfare Cost and Funded Position

Service cost and APBO	Projected unit credit actuarial cost method, allocated in equal amounts, from the valuation date on or after date of hire to full eligibility date.
Net loss (gain)	Net loss (gain) in excess of 10% of the APBO is amortized on a straight-line basis over the expected average expected remaining service of active participants expected to benefit under the plan.
Benefits Not Valued	All benefits described in the Plan Provisions section of this report were valued. Towers Watson has reviewed the plan provisions with AEP and based on that review is not aware of any significant benefits required to be valued that were not included.
Timing of benefit payments	Benefit payments are assumed to be made uniformly throughout the year and on average at mid-year.
Change in Assumptions and Methods Since Prior Valuation	<p>The discount rate was decreased from 4.30% to 4.10%.</p> <p>Anticipated per capita claims costs and the excise tax loads were updated to reflect more recent experience.</p> <p>The expected return on assets was decreased from 7.00% to 6.75%.</p>

Data Sources

American Electric Power furnished the participant and claims cost data, as well as the accrued postretirement benefits cost as of December 31, 2016. Data were reviewed for reasonableness and consistency, but no audit was performed. We are aware of no errors or omissions in the data that would have a significant effect on the results of our calculation.

Assumptions Rationale - Significant Economic Assumptions

Per capita claims costs	<p>AEP supplied data on retiree medical and prescription drug claim payments for the period October 2012 through September 2016.</p> <p>Separate medical and prescription drug claim rates were calculated by dividing annual paid claims (from October through September for each 12-month period) by covered lives over these four periods. These claim rates were trended to 2017 and a weighted average was taken to calculate the average pre-65 and post-65 claim rates for medical and prescription drugs. Weighing factors of 30% were used for the two most recent years, while factors of 20% were used for the other two years. These rates were then age-graded over standard Willis Towers Watson morbidity curves to generate quinquennial age-banded 2017 medical and prescription drug claims rates.</p>
Excise tax payments	To determine impact of the excise tax on the UMWA postretirement plan, we projected future gross plan costs using the valuation trend assumption and compared these on a year-by-year basis to the excise tax thresholds beginning in 2018 and

projected to future years using CPI (CPI + 1% for 2019). The cost of the UMWA plan, which was blended pre-65/post-65 based on headcount, is projected to exceed these thresholds beginning in 2018. The tax, though, will not apply until 2020.

The amount of the excise tax valued was 40% times the portion of projected plan cost exceeding the thresholds.

Medicare Part D subsidy value

We calibrated our modeling tool to reflect the 2017 cost of the current prescription drug plans for AEP's UMWA post-65 retirees. The tool employs a continuance table of annual retiree drug utilization levels, developed from analyzing the experience of several large employers reflecting utilization of 3.1 million Medicare-eligible members during 2012.

After the plan-specific benefit provisions have been calibrated to current costs, the Modeler trends costs forward to 2017. Actuarial equivalence was determined using the following two-prong approach outlined in the regulations for Medicare Part D:

Gross Value Test – The Modeler calculates the value of standard Medicare Part D coverage (ignoring benefit enhancements from ACA) and compares it to AEP's plan costs. AEP's plan passed this test by being richer than the projected value of standard Medicare Part D coverage for these groups.

Net Value Test – The net value prong of the test compared the value of Standard Part D (ignoring benefit enhancements from ACA) coverage in 2017 less the greater of \$427.56 (the national average Part D premium) and 25.5% of the gross value of Part D coverage to the projected 2017 value of AEP coverage.

When the plan is deemed to be actuarially equivalent, the tool calculates the average expected value of the employer subsidy in 2017, using the continuance table calibrated to the prescription drug portion of AEP's plan cost. This produced an average 2017 per person annual employer subsidy of \$974.

Claims cost trend rates

Assumed increases were chosen by the plan sponsor and, as required by U.S. GAAP, they represent an estimate of future experience, informed by an analysis of recent plan experience, leading to select and ultimate assumed trend rates and reflecting the expected near-term effect of recently enacted program changes. In setting near term trend rates, other pertinent statistics were considered, including surveys on general medical cost increases. In setting the ultimate trend rate, considerations included assumed GDP growth consistent with the assumed future economic conditions inherent in other economic assumptions chosen by the client at the measurement date.

After examining historical variability in trend rates, we believe that the selected assumptions do not significantly conflict with what would be reasonable based on a combination of market conditions at the measurement date and future expectations

consistent with other economic assumptions used, other than the discount rate.

Medicare Part D subsidy trend rates

The rates of increase in per capita Medicare Part D subsidy payments are assumed to equal the plan's assumed trend rates for prescription drug claims.

Assumptions Rationale - Significant Demographic Assumptions

Healthy Mortality	Assumptions were selected by the plan sponsor and, as required by U.S. GAAP, represent a best estimate of future experience.
Disabled Mortality	Assumptions were selected by the plan sponsor and, as required by U.S. GAAP, represent a best estimate of future experience.
Termination	Termination rates are based on plan sponsor expectations for the future with periodic monitoring of observed gains and losses caused by termination patterns different than assumed.
Disability	Disability rates are based on plan sponsor expectations for the future with periodic monitoring of observed gains and losses caused by disability patterns different than assumed.
Retirement	Retirement rates are based on plan sponsor expectations for the future with periodic monitoring of observed gains and losses caused by retirement patterns different than assumed.
Participation	
<ul style="list-style-type: none"> ■ Participants 	The assumed coverage rates for participants and spouses reflect historical experience as well as anticipated future experience based on a 100% employer paid benefit.
<ul style="list-style-type: none"> ■ Covered dependents 	The assumed dependent coverage prevalence of future retirees is based on the dependent coverage observed among recent retirees and general population statistics on the marital status of individuals of retirement age.
<ul style="list-style-type: none"> ■ Covered Spouse age 	The assumed age difference for spouses of future retirees is based on the age difference observed among recent retirees and general population statistics of the age difference for married individuals of retirement age.

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Appendix B: Summary of substantive plan provisions

Medical Benefits	
Eligibility	Participants are eligible upon retirement after age 55 with ten years of service or attaining age 55 with ten years of service after becoming permanently disabled or age 55 if retired with 20 years of service prior to age 50. Miners with less than ten years at retirement who are permanently and totally disabled as a result of a mine accident will retain a health services card for life.
Dependent eligibility	Eligible dependents are spouse and unmarried children who have not attained age 27.
Survivor eligibility	After the death of retiree or active employee eligible to retire, surviving spouses are eligible until death or remarriage subject to a \$2,000 per month earnings limit.
Retiree contributions	None.
Benefits provisions	<p>The UMWA medical plan covers substantially all medical services. Effective for retirements on or after January 1, 1994, a \$750 annual per family deductible is in place for non-Medicare-eligible retirees. Copayments are required only for outpatient physician visits (\$12 in-network and \$20 out-of-network, maximum of \$240 per family per 12 months) and for prescription drugs (\$5 retail in PPL, \$10 out of PPL, no copay mail order). A schedule of allowances for vision care is also provided. Benefits after age 65 are coordinated with Medicare.</p> <p>Expenses associated with the treatment of Black Lung Disease are not covered by this plan.</p>

Future Plan Changes

No future plan changes were recognized in determining postretirement welfare cost.

Changes in Benefits Valued Since Prior Year

There have been no changes in benefits valued since the prior year.

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Appendix C: Results by business unit

Summary of key assumptions for Appendix C of 2017 UMWA Postretirement Health Care Plan valuation report:

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Discount Rate	4.10%	4.49%	4.65%	4.68%	4.61%	4.93%	5.24%	5.56%	5.87%	6.19%	6.41%
Expected Return on Assets	6.75%	7.00%	7.25%	7.25%	7.25%	7.25%	7.50%	7.50%	7.75%	7.75%	7.75%
Initial Medical Trend	6.75%	6.50%	6.25%	6.00%	5.75%	5.50%	5.25%	5.00%	5.00%	5.00%	5.00%
Mortality table	RP-2014, factored to 2006, blue collar, headcount weighted										
Mortality projection scale	Rates grade linearly by year from MP-2014 in 2007 to 0.75% in 2015. Rates grade linearly by age to zero at age 95 from age 85.										
Valuation and data	January 1, 2017										
Per capita claims cost	2017 cost models based on actual claims experience paid through September 30, 2016										

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
SUMMARY OF PLAN PARTICIPANTS FOR THE 2017 VALUATION**

	Active Participants	Retirees*	Dependent Spouses	Surviving Spouses	Total
225 Cedar Coal Co.	0	73	52	108	233
270 Cook Coal Terminal	35	39	31	0	105
290 Conesville Coal Preparation Company	<u>0</u>	<u>30</u>	<u>22</u>	<u>1</u>	<u>53</u>
Total	35	142	105	109	391

*includes disabled employees

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
2017 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	33,979,545 \$33,979,545	2,378,476 \$2,378,476	0 \$0	0 \$0	1,344,892 \$1,344,892	0 \$0	0 \$0	294,120 \$294,120	1,639,012 \$1,639,012
270 Cook Coal Terminal AEP Generating Company	39,444,401 \$39,444,401	1,011,842 \$1,011,842	31,414,235 \$31,414,235	853,575 \$853,575	1,631,683 \$1,631,683	(2,110,641) (\$2,110,641)	0 \$0	341,423 \$341,423	716,040 \$716,040
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	11,797,085 \$11,797,085	631,370 \$631,370	0 \$0	0 \$0	470,867 \$470,867	0 \$0	0 \$0	102,113 \$102,113	572,980 \$572,980
Total	\$85,221,031	\$4,021,688	\$31,414,235	\$853,575	\$3,447,442	(\$2,110,641)	\$0	\$737,656	\$2,928,032

AMERICAN ELECTRIC POWER
 UMWA POSTRETIREMENT WELFARE PLAN
 10-YEAR PRW COST FORECAST
 (\$000s)

Location	ASC 715-60 Cost										
	2017	2018	2019	2020	2021	Projected Net Periodic Postretirement Benefit Cost					
						2022	2023	2024	2025	2026	
225 Cedar Coal Co.	1,639	1,488	1,395	1,329	1,280	1,179	1,141	1,097	1,045	987	899
Appalachian Power Co. - SEC	1,639	1,488	1,395	1,329	1,280	1,179	1,141	1,097	1,045	987	899
270 Cook Coal Terminal	716	416	240	212	243	88	(53)	(103)	(267)	(337)	(459)
AEP Generating Company	716	416	240	212	243	88	(53)	(103)	(267)	(337)	(459)
290 Conesville Coal Preparation Company	573	530	507	495	489	462	458	453	445	435	412
AEP Generation Resources - SEC	573	530	507	495	489	462	458	453	445	435	412
Total	\$2,928	\$2,434	\$2,142	\$2,036	\$2,012	\$1,729	\$1,546	\$1,447	\$1,223	\$1,085	\$852

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2018 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	31,179,827 \$31,179,827	2,388,070 \$2,388,070	0 \$0	0 \$0	1,346,526 \$1,346,526	0 \$0	0 \$0	141,550 \$141,550	1,488,076 \$1,488,076
270 Cook Coal Terminal AEP Generating Company	38,724,337 \$38,724,337	1,078,507 \$1,078,507	33,229,074 \$33,229,074	793,146 \$793,146	1,749,838 \$1,749,838	(2,303,225) (\$2,303,225)	0 \$0	175,801 \$175,801	415,560 \$415,560
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	11,012,780 \$11,012,780	647,536 \$647,536	0 \$0	0 \$0	479,945 \$479,945	0 \$0	0 \$0	49,996 \$49,996	529,941 \$529,941
Total	\$80,916,944	\$4,114,113	\$33,229,074	\$793,146	\$3,576,309	(\$2,303,225)	\$0	\$367,347	\$2,433,577

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2019 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	29,470,452 \$29,470,452	2,341,275 \$2,341,275	0 \$0	0 \$0	1,315,604 \$1,315,604	0 \$0	0 \$0	79,837 \$79,837	1,395,441 \$1,395,441
270 Cook Coal Terminal AEP Generating Company	39,298,275 \$39,298,275	1,150,269 \$1,150,269	34,869,353 \$34,869,353	792,420 \$792,420	1,836,442 \$1,836,442	(2,495,598) (\$2,495,598)	0 \$0	106,461 \$106,461	239,725 \$239,725
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	10,604,872 \$10,604,872	611,542 \$611,542	0 \$0	0 \$0	478,722 \$478,722	0 \$0	0 \$0	28,729 \$28,729	507,451 \$507,451
Total	\$79,373,599	\$4,103,086	\$34,869,353	\$792,420	\$3,630,768	(\$2,495,598)	\$0	\$215,027	\$2,142,617

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2020 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co.	28,303,276	2,456,338	0	0	1,268,259	0	0	60,429	1,328,688
Appalachian Power Co. - SEC	\$28,303,276	\$2,456,338	\$0	\$0	\$1,268,259	\$0	\$0	\$60,429	\$1,328,688
270 Cook Coal Terminal	40,574,014	1,217,643	36,454,407	822,887	1,909,941	(2,607,139)	0	86,629	212,318
AEP Generating Company	\$40,574,014	\$1,217,643	\$36,454,407	\$822,887	\$1,909,941	(\$2,607,139)	\$0	\$86,629	\$212,318
290 Conesville Coal Preparation Company	10,419,956	658,617	0	0	472,600	0	0	22,247	494,847
AEP Generation Resources - SEC	\$10,419,956	\$658,617	\$0	\$0	\$472,600	\$0	\$0	\$22,247	\$494,847
Total	\$79,297,246	\$4,332,598	\$36,454,407	\$822,887	\$3,650,800	(\$2,607,139)	\$0	\$169,305	\$2,035,853

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2021 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	27,379,038 \$27,379,038	2,383,570 \$2,383,570	0 \$0	0 \$0	1,208,770 \$1,208,770	0 \$0	0 \$0	71,029 \$71,029	1,279,799 \$1,279,799
270 Cook Coal Terminal AEP Generating Company	42,498,743 \$42,498,743	1,269,018 \$1,269,018	38,056,221 \$38,056,221	882,791 \$882,791	1,972,465 \$1,972,465	(2,722,533) (\$2,722,533)	0 \$0	110,254 \$110,254	242,977 \$242,977
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	10,333,519 \$10,333,519	648,974 \$648,974	0 \$0	0 \$0	461,936 \$461,936	0 \$0	0 \$0	26,808 \$26,808	488,744 \$488,744
Total	\$80,211,300	\$4,301,562	\$38,056,221	\$882,791	\$3,643,171	(\$2,722,533)	\$0	\$208,091	\$2,011,520

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2022 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	25,059,669 \$25,059,669	2,314,569 \$2,314,569	0 \$0	0 \$0	1,178,712 \$1,178,712	0 \$0	0 \$0	0 \$0	1,178,712 \$1,178,712
270 Cook Coal Terminal AEP Generating Company	42,159,402 \$42,159,402	1,306,283 \$1,306,283	39,752,713 \$39,752,713	839,504 \$839,504	2,087,393 \$2,087,393	(2,838,689) (\$2,838,689)	0 \$0	0 \$0	88,208 \$88,208
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	9,703,295 \$9,703,295	677,355 \$677,355	0 \$0	0 \$0	461,735 \$461,735	0 \$0	0 \$0	0 \$0	461,735 \$461,735
Total	\$76,922,366	\$4,298,207	\$39,752,713	\$839,504	\$3,727,840	(\$2,838,689)	\$0	\$0	\$1,728,655

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2023 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	22,878,849 \$22,878,849	2,261,123 \$2,261,123	0 \$0	0 \$0	1,141,123 \$1,141,123	0 \$0	0 \$0	0 \$0	1,141,123 \$1,141,123
270 Cook Coal Terminal AEP Generating Company	41,867,758 \$41,867,758	1,355,660 \$1,355,660	41,373,327 \$41,373,327	798,339 \$798,339	2,202,097 \$2,202,097	(3,053,081) (\$3,053,081)	0 \$0	0 \$0	(52,645) (\$52,645)
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	9,073,265 \$9,073,265	668,756 \$668,756	0 \$0	0 \$0	458,445 \$458,445	0 \$0	0 \$0	0 \$0	458,445 \$458,445
Total	\$73,819,872	\$4,285,539	\$41,373,327	\$798,339	\$3,801,665	(\$3,053,081)	\$0	\$0	\$1,546,923

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2024 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	20,808,449 \$20,808,449	2,193,079 \$2,193,079	0 \$0	0 \$0	1,096,502 \$1,096,502	0 \$0	0 \$0	0 \$0	1,096,502 \$1,096,502
270 Cook Coal Terminal AEP Generating Company	41,611,959 \$41,611,959	1,397,429 \$1,397,429	43,070,748 \$43,070,748	759,193 \$759,193	2,316,869 \$2,316,869	(3,178,850) (\$3,178,850)	0 \$0	0 \$0	(102,788) (\$102,788)
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	8,475,831 \$8,475,831	656,500 \$656,500	0 \$0	0 \$0	453,127 \$453,127	0 \$0	0 \$0	0 \$0	453,127 \$453,127
Total	\$70,896,239	\$4,247,008	\$43,070,748	\$759,193	\$3,866,498	(\$3,178,850)	\$0	\$0	\$1,446,841

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2025 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	18,850,881 \$18,850,881	2,146,288 \$2,146,288	0 \$0	0 \$0	1,045,064 \$1,045,064	0 \$0	0 \$0	0 \$0	1,045,064 \$1,045,064
270 Cook Coal Terminal AEP Generating Company	41,399,712 \$41,399,712	1,468,532 \$1,468,532	44,852,169 \$44,852,169	721,966 \$721,966	2,431,481 \$2,431,481	(3,420,199) (\$3,420,199)	0 \$0	0 \$0	(266,752) (\$266,752)
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	7,911,127 \$7,911,127	670,173 \$670,173	0 \$0	0 \$0	445,255 \$445,255	0 \$0	0 \$0	0 \$0	445,255 \$445,255
Total	\$68,161,720	\$4,284,993	\$44,852,169	\$721,966	\$3,921,800	(\$3,420,199)	\$0	\$0	\$1,223,567

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2026 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	16,974,374 \$16,974,374	2,078,955 \$2,078,955	0 \$0	0 \$0	987,085 \$987,085	0 \$0	0 \$0	0 \$0	987,085 \$987,085
270 Cook Coal Terminal AEP Generating Company	41,202,742 \$41,202,742	1,525,154 \$1,525,154	46,803,836 \$46,803,836	686,565 \$686,565	2,545,805 \$2,545,805	(3,569,300) (\$3,569,300)	0 \$0	0 \$0	(336,930) (\$336,930)
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	7,350,485 \$7,350,485	649,151 \$649,151	0 \$0	0 \$0	435,095 \$435,095	0 \$0	0 \$0	0 \$0	435,095 \$435,095
Total	\$65,527,601	\$4,253,260	\$46,803,836	\$686,565	\$3,967,985	(\$3,569,300)	\$0	\$0	\$1,085,250

**AMERICAN ELECTRIC POWER
UMWA POSTRETIREMENT WELFARE PLAN
ESTIMATED 2027 NET PERIODIC POSTRETIREMENT BENEFIT COST**

Location	Accumulated Postretirement Benefit Obligation	Expected Net Benefit Payments	Fair Value of Assets	Service Cost	Interest Cost	Expected Return on Assets	Amortizations		Net Periodic Postretirement Benefit Cost
							PSC	(G)/L	
225 Cedar Coal Co. Appalachian Power Co. - SEC	15,393,337 \$15,393,337	2,025,094 \$2,025,094	0 \$0	0 \$0	922,681 \$922,681	0 \$0	0 \$0	(23,869) (\$23,869)	898,812 \$898,812
270 Cook Coal Terminal AEP Generating Company	41,588,371 \$41,588,371	1,562,760 \$1,562,760	48,847,982 \$48,847,982	672,565 \$672,565	2,659,226 \$2,659,226	(3,726,292) (\$3,726,292)	0 \$0	(64,488) (\$64,488)	(458,989) (\$458,989)
290 Conesville Coal Preparation Company AEP Generation Resources - SEC	6,916,633 \$6,916,633	664,339 \$664,339	0 \$0	0 \$0	422,333 \$422,333	0 \$0	0 \$0	(10,725) (\$10,725)	411,608 \$411,608
Total	\$63,898,341	\$4,252,193	\$48,847,982	\$672,565	\$4,004,240	(\$3,726,292)	\$0	(\$99,082)	\$851,431