

State Reliability Mechanism: 3(b) Offset Calculation

Line No.	Month	Victoria	Hoist	McClure	Gladstone	Prickett	UPPCO Generation Total	Market Value of UPPCO Generation
		(Unit)	(MWh)	(MWh)	(MWh)	(MWh)	(MWh)	(\$)
1								
2								
3	January	4,900.55	1,026.97	2,920.73	20.26	488.81	9,357.31	\$ 692,051.26
4	February	3,833.00	776.99	2,218.61	0	516.27	7,344.87	\$ 511,651.26
5	March	5,379.43	1,049.58	3,118.60	-	827.96	10,375.57	\$ 512,246.63
6	April	6,864.77	1,566.88	4,358.71	-	1,179.41	13,969.77	\$ 608,631.43
7	May	5,971.76	2,035.70	5,020.37	-	1,134.55	14,162.37	\$ 646,720.31
8	June	4,452.73	1,628.73	4,242.68	8.62	589.63	10,922.39	\$ 502,459.60
9	July	3,922.78	865.73	2,489.87	13.58	441.60	7,733.56	\$ 400,846.31
10	August	2,759.79	623.21	2,036.85	35.64	353.80	5,809.28	\$ 273,493.48
11	September	3,676.70	795.43	2,448.61	9.83	421.38	7,351.95	\$ 317,470.81
12	October	5,438.98	1,304.13	3,700.83	-	750.43	11,194.38	\$ 475,334.78
13	November	6,222.88	1,320.80	4,050.12	-	863.04	12,456.84	\$ 528,812.02
14	December	6,373.19	1,300.98	3,769.22	-	734.34	12,177.73	\$ 559,413.55
15								
16	Total	59,796.56	14,295.13	40,375.19	87.93	8,301.22	122,856.02	\$ 6,029,131.44

Schedule A1

Michigan Public Service Commission
Upper Peninsula Power Company
Revenue Deficiency (Sufficiency)
Projected 12 Month Period Ending December 31, 2025

Case No.: U-21555
Exhibit No.: A-36 (EWS-9)
Schedule: Indicative A1 (U-21513)
Page: 2 of 2
Witness: Eric W. Stocking

	(a)	(b)	(c)	(d)	(e)
Line No.	Description	Source	Total	Retail	Wholesale
1					
2	Rate Base	Exh. A-7 (NLW-19), Sch. B1	\$ 387,849,050	\$ 383,046,199	\$ 4,802,851
3					
4	Adjusted Net Operating Income	Exh. A-8 (NLW-23), Sch. C1	\$ 14,596,989	\$ 15,195,434	\$ (598,445)
5					
6	Overall Rate of Return	Line 4 ÷ Line 2	3.76 %	3.97%	-12.46%
7					
8	Required Rate of Return	Exh. A-9 (NEK-6), Sch. D1	7.02%	7.02%	7.02%
9					
10	Income Requirements	Line 2 x Line 8	\$ 27,234,760	\$ 26,897,504	\$ 337,256
11					
12	Income Deficiency (Sufficiency)	Line 10 - Line 4	\$ 12,637,771	\$ 11,702,070	\$ 935,702
13					
14	Revenue Conversion Factor	Exh. A-8 (NLW-24), Sch. C2	1.3288	1.3288	1.3288
15					
16	Revenue Deficiency (Sufficiency)	Line 12 x Line 14	<u>\$ 16,793,071</u>	<u>\$ 15,549,710</u>	<u>\$ 1,243,360</u>
17					
18	Revenue Offset U-20995		\$ 1,241,192	\$ 1,241,192	\$ —
19					
20	Revenue Adjustment U-20757		\$ 165,779	\$ 165,779	
21					
22	Revenue Adjustment U-20276 (pension liability)		\$ (421,484)	\$ (421,484)	
23					
24	Revenue Deficiency (Sufficiency)		<u>\$ 17,778,558</u>	<u>\$ 16,535,198</u>	<u>\$ 1,243,360</u>
25					
26	Percentage Increase (Decrease)		15.27%	14.20%	N/A
27					
28	Actual ROE		3.44%	3.90%	
29					
30	Revenue Deficiency (Sufficiency)		\$ 17,778,558	\$ 16,535,198	
31					
32	Present Revenues		\$ 116,431,780	\$ 116,426,967	
33					
34	Percentage Increase (Decrease)		15.27%	14.20%	

Schedule B1

Michigan Public Service Commission
Upper Peninsula Power Company
Projected Rate Base
Projected 12 Month Period Ending December 31, 2025

Case No.: U-21555
Exhibit No.: A-36 (EWS-9)
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Page: 2 of 2
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	(a)	(b)	(c)	(d)	(e)
Line No.	Description	Source	Total	Integrated Retail	Wholesale
1					
2	Plant in Service	Exh. A-7 (NLW-20), Sch. B2	469,242,626	463,083,753	6,158,873
3	Plant Held for Future Use	Exh. A-7 (NLW-20), Sch. B2	—	—	—
4	Construction Work in Progress	Exh. A-7 (NLW-20), Sch. B2	34,908,725	34,313,157	595,568
5	Total Utility Plant		504,151,351	497,396,910	6,754,441
6					
7	Less: Depreciation Reserve	Exh. A-7 (NLW-21), Sch. B3	206,285,031	203,637,924	2,647,107
8					
9	Net Utility Plant	Line 5 - Line 7	297,866,320	293,758,985	4,107,334
10					
11	Net Capital Lease Property		—	—	—
12					
13	Total Utility Property and Plant	Line 9 + Line 11	297,866,320	293,758,985	4,107,334
14					
15	Less: Capital Lease Obligations		—	—	—
16					
17	Net Plant	Line 13 + Line 15	297,866,320	293,758,985	4,107,334
18					
19	Allowance for Working Capital	Exh. A-7 (NLW-22), Sch. B4	89,982,730	89,287,213	695,517
20					
21	Total Rate Base	Line 17 + Line 19	387,849,050	383,046,199	4,802,851

Upper Peninsula Power Company
Projection of Balance Sheet and Benefit Cost
OPEB Plans

Total OPEB	2023	2024	2025
Accumulated Postretirement Benefit Obligation (APBO)	(13,195,115)	(12,865,072)	(13,358,999)
Fair value of assets (FVA)	<u>25,320,058</u>	<u>25,143,988</u>	<u>25,914,389</u>
Funded status	12,124,943	12,278,916	12,555,390
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	(1,608,669)	(931,330)	(253,991)
Net (gain) / loss	<u>(10,387,722)</u>	<u>(9,329,116)</u>	<u>(8,372,490)</u>
Total	(11,996,391)	(10,260,446)	(8,626,481)
Service cost	501,928	470,810	490,088
Interest cost	733,754	779,239	808,997
Expected return on assets	(1,571,451)	(1,601,893)	(1,600,701)
Amortization of net prior service cost/(credit)	(677,339)	(677,339)	(257,833)
Amortization of net (gain)/loss	<u>(746,537)</u>	<u>(721,509)</u>	<u>(601,446)</u>
Net periodic benefit cost	(1,759,645)	(1,750,692)	(1,160,895)

Administrative Medical	2023	2024	2025
Accumulated Postretirement Benefit Obligation (APBO)	(1,232,350)	(1,207,292)	(1,235,565)
Fair value of assets (FVA)	<u>1,322,368</u>	<u>1,227,808</u>	<u>1,202,183</u>
Funded status	90,018	20,516	(33,382)
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	5,673	31,886	58,099
Net (gain) / loss	<u>513,368</u>	<u>536,485</u>	<u>546,333</u>
Total	519,041	568,371	604,432
Service cost	89,175	85,260	85,260
Interest cost	66,351	71,899	73,399
Expected return on assets	(85,457)	(82,541)	(77,461)
Amortization of net prior service cost/(credit)	(26,213)	(26,213)	(26,213)
Amortization of net (gain)/loss	<u>7,971</u>	<u>7,620</u>	<u>17,608</u>
Net periodic benefit cost	51,827	56,025	72,593
Discount rate	5.30%	5.85%	5.85%
Expected return on assets	5.50%	5.50%	5.50%
Actual return on assets	-0.59%	5.50%	5.50%

Upper Peninsula Power Company
Projection of Balance Sheet and Benefit Cost
OPEB Plans

Non-Administrative Medical	2023	2024	2025
Accumulated Postretirement Benefit Obligation (APBO)	(10,499,529)	(10,303,712)	(10,815,235)
Fair value of assets (FVA)	<u>23,975,447</u>	<u>23,916,180</u>	<u>24,712,206</u>
Funded status	13,475,918	13,612,468	13,896,971
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	(1,492,157)	(854,936)	(217,715)
Net (gain) / loss	<u>(11,364,998)</u>	<u>(10,237,610)</u>	<u>(9,269,474)</u>
Total	(12,857,155)	(11,092,546)	(9,487,189)
Service cost	412,753	385,550	404,828
Interest cost	593,024	631,632	662,577
Expected return on assets	(1,485,543)	(1,518,823)	(1,522,636)
Amortization of net prior service cost/(credit)	(637,221)	(637,221)	(217,715)
Amortization of net (gain)/loss	<u>(784,172)</u>	<u>(750,998)</u>	<u>(640,030)</u>
Net periodic benefit cost	(1,901,159)	(1,889,860)	(1,312,976)
Discount rate	5.55%	6.05%	6.05%
Expected return on assets	5.50%	5.50%	5.50%
Actual return on assets	1.27%	5.50%	5.50%

Retiree Life Insurance	2023	2024	2025
Accumulated Postretirement Benefit Obligation (APBO)	(1,463,236)	(1,354,068)	(1,308,199)
Fair value of assets (FVA)	<u>22,243</u>	<u>0</u>	<u>0</u>
Funded status	(1,440,993)	(1,354,068)	(1,308,199)
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	(122,185)	(108,280)	(94,375)
Net (gain) / loss	<u>463,908</u>	<u>372,009</u>	<u>350,651</u>
Total	341,723	263,729	256,276
Service cost	0	0	0
Interest cost	74,379	75,708	73,021
Expected return on assets	(451)	(529)	(604)
Amortization of net prior service cost/(credit)	(13,905)	(13,905)	(13,905)
Amortization of net (gain)/loss	<u>29,664</u>	<u>21,869</u>	<u>20,976</u>
Net periodic benefit cost	89,687	83,143	79,488
Discount rate	5.30%	5.85%	5.85%
Expected return on assets	5.50%	5.50%	5.50%
Actual return on assets	3.90%	N/A	N/A

The results are based on the January 1, 2023 valuation results delivered on August 23, 2023. The forecast reflects:
> discount rates as of 9/30/2023
> estimated 2023 asset returns reflect actual returns through 9/30/2023 and assumes 0% return for the remainder of 2023



Upper Peninsula Power Company
Projection of Balance Sheet and Benefit Cost
Pension Plans

Total Pension	2023	2024	2025
Projected Benefit Obligation (PBO)	(81,274,728)	(74,757,664)	(73,009,408)
Fair value of assets (FVA)	<u>89,573,343</u>	<u>81,143,310</u>	<u>79,013,751</u>
Funded status	8,298,615	6,385,646	6,004,343
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	0	0	0
Net (gain) / loss	<u>44,857,312</u>	<u>47,334,021</u>	<u>48,068,718</u>
Total	44,857,312	47,334,021	48,068,718
Service cost	524,929	461,806	447,010
Interest cost	4,216,810	4,249,926	4,129,911
Expected return on assets	(5,815,852)	(5,570,130)	(5,171,685)
Amortization of net prior service cost/(credit)	0	0	0
Amortization of net (gain)/loss	<u>565,434</u>	<u>546,540</u>	<u>797,536</u>
Net periodic benefit cost	(508,679)	(311,858)	202,772

UPPCO Retirement Plan	2023	2024	2025
Projected Benefit Obligation (PBO)	(80,869,594)	(74,399,746)	(72,673,341)
Fair value of assets (FVA)	<u>89,573,343</u>	<u>81,143,310</u>	<u>79,013,751</u>
Funded status	8,703,749	6,743,564	6,340,410
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	0	0	0
Net (gain) / loss	<u>44,747,720</u>	<u>47,243,526</u>	<u>47,984,703</u>
Total	44,747,720	47,243,526	47,984,703
Service cost	524,929	461,806	447,010
Interest cost	4,196,825	4,230,227	4,111,464
Expected return on assets	(5,815,852)	(5,570,130)	(5,171,685)
Amortization of net prior service cost/(credit)	0	0	0
Amortization of net (gain)/loss	<u>558,477</u>	<u>540,074</u>	<u>791,326</u>
Net periodic benefit cost	(535,621)	(338,023)	178,115
Discount rate	5.40%	5.90%	5.90%
Expected return on assets	5.50%	5.50%	5.50%
Actual return on assets	-0.94%	5.50%	5.50%
Amortization Period	25.00	25.00	25.00



Upper Peninsula Power Company
Projection of Balance Sheet and Benefit Cost
Pension Plans

UPPCO SERP Plan	2023	2024	2025
Projected Benefit Obligation (PBO)	(99,977)	(89,393)	(81,850)
Fair value of assets (FVA)	0	0	0
Funded status	(99,977)	(89,393)	(81,850)
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	0	0	0
Net (gain) / loss	84,445	74,895	68,425
Total	84,445	74,895	68,425
Service cost	0	0	0
Interest cost	4,914	4,831	4,410
Expected return on assets	0	0	0
Amortization of net prior service cost/(credit)	0	0	0
Amortization of net (gain)/loss	6,957	6,466	6,210
Net periodic benefit cost	11,871	11,297	10,620
Discount rate	5.25%	5.80%	5.80%
Expected return on assets	0.00%	0.00%	0.00%
Actual return on assets	0.00%	0.00%	0.00%

UPPCO Restoration Plan	2023	2024	2025
Projected Benefit Obligation (PBO)	(305,157)	(268,525)	(254,217)
Fair value of assets (FVA)	0	0	0
Funded status	(305,157)	(268,525)	(254,217)
Accumulated Other Comprehensive (Income)/Loss			
Net prior service cost/(credit)	0	0	0
Net (gain) / loss	25,147	15,600	15,590
Total	25,147	15,600	15,590
Service cost	0	0	0
Interest cost	15,071	14,868	14,037
Expected return on assets	0	0	0
Amortization of net prior service cost/(credit)	0	0	0
Amortization of net (gain)/loss	0	0	0
Net periodic benefit cost	15,071	14,868	14,037
Discount rate	5.30%	5.85%	5.85%
Expected return on assets	0.00%	0.00%	0.00%
Actual return on assets	0.00%	0.00%	0.00%

The results are based on the January 1, 2023 valuation results delivered on August 23, 2023. The forecast reflects:
> discount rates as of 9/30/2023
> estimated 2023 asset returns reflect actual returns through 9/30/2023 and assumes 0% return for the remainder of 2023



Deferred Bad Debt Expense (U-20757)					
		Balance Forward	Donation to Superior Watershed	Amortization per U-21286 Settlement	End of Year Balance
2023	Actual	\$ 863,118	\$ (200,000)	\$ (165,780)	\$ 497,338
2024	Projected	\$ 497,338		\$ (331,559)	\$ 165,779
2025	Projected	\$ 165,779		\$ (165,779)	\$ -

UPPCO Monthly Revolver							\$ 74,124,000.00			
	Revolver	3-mo. SOFR Rate	Margin Rate	Total Rate	Monthly Interest Expense	Annual Expense	Commitment Fee Rate	Capacity	Commitment Fee	# of Days
actual	December-23	\$ 45,000,000	5.35%	1.625%	6.98%	\$ 261,563	0.00225	\$ 29,124,000	\$ 5,643	31
fcast	January-24	\$ 45,000,000	5.33%	1.625%	6.96%	\$ 260,813	0.00225	\$ 29,124,000	\$ 5,643	31
fcast	February-24	\$ 48,313,676	5.32%	1.625%	6.95%	\$ 279,615	0.00225	\$ 25,810,324	\$ 4,517	28
fcast	March-24	\$ 48,313,676	5.31%	1.625%	6.94%	\$ 279,213	0.00225	\$ 25,810,324	\$ 5,001	31
fcast	April-24	\$ 57,427,172	5.22%	1.625%	6.85%	\$ 327,574	0.00225	\$ 16,696,828	\$ 3,131	30
fcast	May-24	\$ 57,427,172	5.16%	1.625%	6.79%	\$ 324,703	0.00225	\$ 16,696,828	\$ 3,235	31
fcast	June-24	\$ 57,427,172	5.12%	1.625%	6.75%	\$ 322,789	0.00225	\$ 16,696,828	\$ 3,131	30
fcast	July-24	\$ 68,567,595	4.88%	1.625%	6.51%	\$ 371,694	0.00225	\$ 5,556,405	\$ 1,077	31
fcast	August-24	\$ 68,567,595	4.80%	1.625%	6.43%	\$ 367,122	0.00225	\$ 5,556,405	\$ 1,077	31
fcast	September-24	\$ -	4.73%	1.625%	6.36%	\$ -	0.00225	\$ 74,124,000	\$ 13,898	30
fcast	October-24	\$ 7,469,157	4.62%	1.625%	6.25%	\$ 38,871	0.00225	\$ 66,654,843	\$ 12,914	31
fcast	November-24	\$ 7,469,157	4.48%	1.625%	6.11%	\$ 37,999	0.00225	\$ 66,654,843	\$ 12,498	30
fcast	December-24	\$ 7,469,157	4.32%	1.625%	5.95%	\$ 37,003	0.00225	\$ 66,654,843	\$ 12,914	31
fcast	January-25	\$ 12,452,473	4.32%	1.625%	5.95%	\$ 61,692	0.00225	\$ 61,671,527	\$ 11,949	31
fcast	February-25	\$ 12,452,473	4.21%	1.625%	5.84%	\$ 60,550	0.00225	\$ 61,671,527	\$ 10,793	28
fcast	March-25	\$ 12,452,473	4.04%	1.625%	5.67%	\$ 58,786	0.00225	\$ 61,671,527	\$ 11,949	31
fcast	April-25	\$ 18,430,595	4.04%	1.625%	5.67%	\$ 87,008	0.00225	\$ 55,693,405	\$ 10,443	30
fcast	May-25	\$ 18,430,595	3.94%	1.625%	5.57%	\$ 85,472	0.00225	\$ 55,693,405	\$ 10,791	31
fcast	June-25	\$ 18,430,595	3.82%	1.625%	5.45%	\$ 83,629	0.00225	\$ 55,693,405	\$ 10,443	30
fcast	July-25	\$ 24,295,604	3.82%	1.625%	5.45%	\$ 110,241	0.00225	\$ 49,828,396	\$ 9,654	31
fcast	August-25	\$ 24,295,604	3.75%	1.625%	5.38%	\$ 108,824	0.00225	\$ 49,828,396	\$ 9,654	31
fcast	September-25	\$ 24,295,604	3.68%	1.625%	5.31%	\$ 107,407	0.00225	\$ 49,828,396	\$ 9,343	30
fcast	October-25	\$ 24,574,780	3.68%	1.625%	5.31%	\$ 108,641	0.00225	\$ 49,549,220	\$ 9,600	31
fcast	November-25	\$ 24,574,780	3.65%	1.625%	5.28%	\$ 108,027	0.00225	\$ 49,549,220	\$ 9,290	30
fcast	December-25	\$ 24,574,780	3.64%	1.625%	5.27%	\$ 107,822	\$ 1,088,098	\$ 49,549,220	\$ 9,600	31

UPPCO Free Cash Flow Projection				
	2023	2024	2025	
	Actual	Forecast	Forecast	
Net Income UPPCO		\$ 7,325,271	\$ 4,261,676	
+ D&A UPPCO		\$ 13,882,914	\$ 14,195,875	
+/- Non-Cash Pension & OPEB		\$ (2,062,550)	\$ (958,123)	
+ Non-Cash Interest Expense (Amort of Debt Disc)		\$ 958,956	\$ 958,956	
+ Deferred Taxes		\$ 1,101,660	\$ 1,427,539	
- Capital Expenditures		\$ (41,388,911)	\$ (33,432,470)	
- Misc Paid-in Capital		\$ (7,879,226)	\$ (7,891,304)	
- Misc Paid-in Capital		\$ (6,000,000)	\$ (6,000,000)	
+ Misc Paid-in Capital		\$ 3,025,132	\$ 10,332,228	
Free Cash Flow		\$ (31,036,752)	\$ (17,105,623)	
+ Term Loan Issuance		\$ 36,686,687		
+ Equity Contribution		\$ 31,880,908		
EOY Revolver Balance	\$ 45,000,000	\$ 7,469,157	\$ 24,574,780	

Upper Peninsula Power Company

Consolidated Actuarial Valuation Report
Benefit Cost for Fiscal Year Beginning
January 1, 2023 under US GAAP

August 2023

wtwco.com

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Purposes of valuation

Upper Peninsula Power Company (the Company) engaged Willis Towers Watson US LLC (“WTW”) to value the Company’s other postretirement benefit plans.

As requested by the Company, this report documents the results of an actuarial valuation of the Plans:

- Upper Peninsula Power Company Administrative Medical and Dental Plan
- Upper Peninsula Power Company Non-Administrative Medical and Dental Plan
- Upper Peninsula Power Company Retiree Life Insurance Plan

The primary purpose of this valuation is to determine the Net Periodic Postretirement Benefit Cost/(Income) (Benefit Cost), in accordance with FASB Accounting Standards Codification Topic 715 (ASC 715) for the fiscal year ending December 31, 2023. It is anticipated that a separate report will be prepared for year-end financial reporting purposes.

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. The expected contribution to the other postretirement benefits plan(s) has been set at \$0.
Note that any significant change in the amounts contributed or expected to be contributed in 2023 from what is disclosed at December 31, 2022 may require disclosure in the interim financial statements, but should not affect the expected return on plan assets absent a remeasurement for another purpose.
2. There may be certain events that have occurred since the valuation date that are not reflected in the current valuation. See Subsequent Events in the Basis for Valuation section below for more information.
3. This report does not provide information for plan accounting and financial reporting under ASC 960 or ASC 965.
4. This report does not present liabilities on a plan termination basis, for which a separate extensive analysis would be required. No funded status measure included in this report is intended to assess, and none may be appropriate for assessing, the sufficiency of plan assets to cover the estimated cost of settling benefit obligations, as all such measures differ in some way from plan termination obligations. In addition, funded status measures shown in this report do not reflect the current costs of settling obligations by offering immediate lump sum payments to participants and/or purchasing annuity contracts for the remaining participants (e.g., insurer profit, insurer pricing of contingent benefits and/or provision for anti-selection in the choice of a lump sum vs. an annuity).
5. The comparisons of plan obligations as determined for accounting and financial reporting purposes to plan assets presented in this report cannot be relied upon to determine the need for nor the amount of required future plan contributions. Nevertheless, such comparisons may be useful to assess the need for future contributions because they reflect current interest rates at

the measurement date in determining benefit obligations. However, asset gains and losses, demographic experience different from assumed, changes in interest rates, future benefit accruals, if any, and other factors will all affect the need for and amount of future contributions. In addition, if a plan is not required by law to be funded, benefit payments may also be paid directly by the plan sponsor as they come due.

Section 1 : Summary of key consolidated results

1.1 Benefit cost, plan assets & obligations

All monetary amounts shown in US Dollars

Fiscal Year Beginning		01/01/2023	01/01/2022
Benefit Cost/ (Income)	Net Periodic Postretirement Benefit Cost/(Income)	(1,759,644)	(812,751)
	Benefit Cost/(Income) due to Special Events	0	0
	Total Benefit Cost/(Income)	(1,759,644)	(812,751)
Measurement Date		01/01/2023	01/01/2022
Plan Assets	Fair Value of Plan Assets (FVA)	25,320,058	31,866,704
	Market Related Value of Plan Assets (MRVA)	28,863,964	28,866,684
	Actual Return on Fair Value of Plan Assets during Prior Year	(18.72%)	8.37%
Benefit Obligations	Accumulated Postretirement Benefit Obligation (APBO)	(13,195,115)	(19,737,101)
Funded Ratio	Fair Value of Plan Assets to APBO	191.8%	161.5%
Accumulated Other Comprehensive (Income)/Loss (Pre-tax)	Net Prior Service Cost/(Credit)	(1,608,669)	(2,340,547)
	Net Loss/(Gain)	(10,387,722)	(10,520,148)
	Total Accumulated Other Comprehensive (Income)/Loss (pre-tax)	(11,996,391)	(12,860,695)
Assumptions	Discount rate	5.50%	3.01%
	Expected Long-Term Rate of Return on Plan Assets	5.50%	4.50%
	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	2030	2030
Participant Data	Census Date	1/1/2023	1/1/2022

1.2 Comments on results

Change in net periodic cost and funded position

The net periodic cost decreased from \$(812,751) in fiscal 2022 to \$(1,759,644) in fiscal 2023 and the funded position declined from \$12,129,603 to \$12,124,943.

Significant reasons for these changes include the following:

- The actual return on the fair value of plan assets since the prior measurement date was less than assumed, which caused the net periodic cost to increase and the funded position to deteriorate.
- The discount rates for the plans increased, which caused the net periodic cost to decrease and the funded position to improve.
- The expected return on assets assumption increased which caused the net periodic cost to decrease.

Effects of Health Care Reform

This valuation reflects our understanding of the relevant provisions of the Patient Protection and Affordable Care Act (PPACA) and Health Care and Education Reconciliation Act (HCERA), and subsequent legislation (the SECURE Act of 2019) that eliminated the Cadillac tax, medical device tax and health insurance issuer tax. The IRS has yet to issue final guidance with respect to many aspects of these laws. 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. The valuation does not anticipate the effects of any additional possible future changes to PPACA or HCERA.

1.3 Basis for valuation

Appendix A summarizes the assumptions, methods and models used in the valuation. Appendix B summarizes our understanding of the principal provisions of the plans being valued. Both of these appendices include a summary of any changes since the prior valuation. Unless otherwise described below under Subsequent Events, assumptions were selected based on information known as of the measurement date.

Subsequent events

WTW is not aware of any other material events that have occurred and are not reflected in the valuation.

Additional information

The Inflation Reduction Act (IRA) was signed on August 16, 2022. This new law includes health care provisions related to Medicare and healthcare financing. While guidance is still forthcoming, the potential effect of the new legislation has been considered in preparing these results. Based on information available, the specific plan provisions, the employer's expected actions in response to the effects of IRA on its plans, and expected participant behavior based on changes in the relative value of plan and individual market coverage, no changes were made to assumptions. Additional changes

may be reflected in future valuations as more guidance becomes available and actual plan experience is used to inform future expectations.

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Actuarial certification

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

Reliances

In preparing the results presented in this report, we have relied on information regarding plan provisions, participants, assets, and sponsor accounting policies and methods provided by the Company and other persons or organizations designated by the Company. See the Sources of Data and Other Information section of Appendix A for further details. We have relied on all the data and information provided as complete and accurate. 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. The results presented in this report are directly dependent upon the accuracy and completeness of the underlying data and information. Any material inaccuracy in the data, assets, plan provisions or other information provided to us may have produced results that are not suitable for the purposes of this report and such inaccuracies, as corrected by the Company, may produce materially different results that could require that a revised report be issued.

Measurement of benefit obligations, plan assets and balance sheet adjustments

Census date/measurement date

The measurement date is January 1, 2023. The benefit obligations were measured as of January 1, 2023 and are based on participant data as of the census date, which is displayed by Plan in Appendix C.

Plan assets and balance sheet adjustments

Information about the fair value of plan assets and the general ledger account balances for the other postretirement benefit plans cost at December 31, 2022, which reflect the expected funded status of the plans before adjustment to reflect the funded status based on the year-end measurements, and differences between the expected Medicare Part D subsidies and amounts received during the year was reviewed for reasonableness and consistency, but no audit was performed.

Accumulated other comprehensive (income)/loss amounts shown in the report are shown prior to adjustment for tax effects. Any tax effects in AOCI should be determined by the Company in consultation with its tax advisors and independent accountants.

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. WTW has evaluated the assumptions used and believes that they do not significantly

conflict with what would be reasonable. In addition, we believe that the combined effect of assumptions is expected to have no significant bias. See Appendix A for a description of each significant assumption used and our rationale for concluding that it does not significantly conflict with what would be reasonable.

U.S. GAAP requires that each significant assumption “individually represent the best estimate of the plan’s future experience solely with respect to that assumption.”

The results shown in this report have been developed based on actuarial assumptions that, to the extent evaluated by WTW, we believe do not significantly conflict with what would be reasonable. Other actuarial assumptions could also be considered to not significantly conflict with what would 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, methods and sources of data and other information used is provided in Appendix A. Note that any subsequent changes in methods or assumptions for the January 1, 2023 measurement date will change the results shown in this report.

Certain models (as described in ASOP No. 56) were used in preparing the information presented herein. Further information on these models can be found in Appendix A.

Nature of actuarial calculations

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 any certainty. The effects of certain plan provisions may be approximated, or determined to be insignificant and therefore not valued. 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. Any rounding (or lack thereof) used for displaying numbers in this report is not intended to imply a degree of precision, which is not a characteristic of actuarial calculations.

If overall future plan experience produces higher benefit payments or lower investment returns than assumed, the relative level of plan costs reported in this valuation will likely increase in future valuations (and vice versa). 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, changes in economic or demographic assumptions, increases or decreases 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. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements. Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements.

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 engagement letter dated November 16, 2020 and any accompanying or referenced terms and conditions.

The information contained in this report was prepared for the internal use of the Company and its independent accountants in connection with our actuarial valuation of the other postretirement benefit plans 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. The Company may distribute this actuarial valuation report to the appropriate authorities who have the legal right to require the Company to provide them this report, in which case the Company will use best efforts to notify WTW in advance of this distribution. Further distribution to, or use by, other parties of all or part of this report is expressly prohibited without WTW's prior written consent. WTW 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 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 other postretirement benefit plans. Our objectivity is not impaired by any relationship between the plan sponsor and our employer, Willis Towers Watson US LLC.



Georgia Louridas, FSA, EA
Director, Retirement
Valuation Actuary
August 2023



Anthony Simone, FSA, MAAA
Director, Retirement
Valuation Actuary and Pricing Specialist
August 2023

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, preparing demographic data, performing the valuation, implementing the appropriate accounting or funding calculations, etc.).

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Section 2 : Consolidated accounting exhibits

2.1 Balance sheet asset/(liability)

All monetary amounts shown in US Dollars

Measurement Date	01/01/2023	01/01/2022
A Development of Balance Sheet Asset/(Liability)¹		
1 Accumulated postretirement benefit obligation (APBO)	(13,195,115)	(19,737,101)
2 Fair value of plan assets (FVA) ²	25,320,058	31,866,704
3 Net balance sheet asset/(liability)	12,124,943	12,129,603
B Current and Noncurrent Classification³		
1 Noncurrent asset	13,565,936	13,840,730
2 Current liability	(95,956)	0
3 Noncurrent liability	(1,345,037)	(1,711,127)
4 Net balance sheet asset/(liability)	12,124,943	12,129,603
C Accumulated Other Comprehensive (Income)/Loss		
1 Net prior service cost/(credit)	(1,608,669)	(2,340,547)
2 Net loss/(gain)	(10,387,722)	(10,520,148)
3 Accumulated other comprehensive (income)/loss ⁴	(11,996,391)	(12,860,695)
D Assumptions and Dates		
1 Discount rate	5.50%	3.01%
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	2030	2030
5 Census date	01/01/2023	01/01/2022

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

² Excludes receivable contributions.

³ The current liability (for each underfunded plan) was measured as the discounted value of benefits expected to be paid over the next 12 months in excess of the fair value of the plan's assets at the measurement date.

⁴ Amount shown is pre-tax and should be adjusted by plan sponsor for tax effects.

2.2 Changes in plan obligations and assets

All monetary amounts shown in US Dollars

Period Beginning	01/01/2023
------------------	------------

A Change in Accumulated Postretirement Benefit Obligation (APBO)

1	APBO at beginning of prior fiscal year	19,737,101
2	Employer service cost	905,405
3	Interest cost	610,983
4	Actuarial loss/(gain)	(7,370,214)
5	Plan participants' contributions	449,488
6	Benefits paid from plan assets	(1,137,648)
7	Benefits paid from Company assets	0
8	Medicare Part D subsidy	0
9	Administrative expenses paid ¹	0
10	Plan amendments	0
11	Acquisitions/(divestitures)	0
12	Curtailments	0
13	Settlements	0
14	Special/contractual termination benefits	0
15	APBO at beginning of current fiscal year	13,195,115

B Change in Plan Assets

1	Fair value of plan assets at beginning of prior fiscal year	31,866,704
2	Actual return on plan assets	(5,905,379)
3	Employer contributions	46,893
4	Plan participants' contributions	449,488
5	Benefits paid	(1,137,648)
6	Administrative expenses paid	0
7	Acquisitions/(divestitures)	0
8	Settlements	0
9	Fair value of plan assets at beginning of current fiscal year	25,320,058

¹ Only if future expenses are accrued in APBO through a load on service cost.

2.3 Summary of net balances

Refer to Appendix C for balances by plan.

2.4 Development of market-related value of assets

All monetary amounts shown in US Dollars

Fiscal Year Ending		12/31/2023
A Development of Market-Related Value of Assets – Total		
1 Fair value of assets at current fiscal year end		25,320,058
2 Deferred investment gains/(losses) for prior periods		
Fiscal Year Gain/(Loss)		
a 12/31/2022		(7,192,792)
b 12/31/2021		1,268,707
c 12/31/2020		2,283,753
d 12/31/2019		2,678,007
e 12/31/2018		(2,282,004)
Percent Deferred		
a 12/31/2022		80%
b 12/31/2021		60%
c 12/31/2020		40%
d 12/31/2019		20%
e 12/31/2018		0%
Deferred Amount		
a 12/31/2022		(5,754,234)
b 12/31/2021		761,224
c 12/31/2020		913,502
d 12/31/2019		535,602
e 12/31/2018		0
3 Market-related value of assets		28,863,964

2.5 Summary and comparison of benefit cost and cash flows

All monetary amounts shown in US Dollars

Fiscal Year Ending	12/31/2023	12/31/2022
A Total Benefit Cost		
1 Employer service cost	501,928	905,405
2 Interest cost	733,754	610,983
3 Expected return on plan assets	(1,571,450)	(1,282,923)
4 Subtotal	(335,768)	233,465
5 Net prior service cost/(credit) amortization	(677,339)	(731,878)
6 Net loss/(gain) amortization	(746,537)	(314,338)
7 Subtotal	(1,423,876)	(1,046,216)
8 Net periodic postretirement benefit cost/(income)	(1,759,644)	(812,751)
9 Curtailment (gain)/loss	0	0
10 Settlement (gain)/loss	0	0
11 Special/contractual termination benefits	0	0
12 Total benefit cost	(1,759,644)	(812,751)
B Assumptions (See Appendix A for interim measurements, if any)		
1 Discount rate	5.50%	3.01%
2 Expected long-term rate of return on plan assets	5.50%	4.50%
3 Current health care cost trend rate	6.75%	7.00%
4 Ultimate health care cost trend rate	5.00%	5.00%
5 Year of ultimate trend rate	2030	2030
6 Census date	01/01/2023	01/01/2022
C Plan Assets at Beginning of Year		
1 Fair value	25,320,058	31,866,704
2 Market-related value	28,863,964	28,866,684
D Cash Flows Net of Medicare Part D Subsidy		
	Expected	Actual
1 Employer contributions	0	46,893
2 Plan participants' contributions	0	449,488
3 Benefits paid from Company assets	130,703	0
4 Benefits paid from plan assets	592,199	1,137,648
E Amortization Period		
	N/A	N/A

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Appendix A : Statement of consolidated actuarial assumptions, methods and data sources

Plan Sponsor

Upper Peninsula Power Company for all plans.

Statement of Assumptions

The assumptions disclosed in this Appendix are for the fiscal year ending December 31, 2022 financial reporting and benefit cost for fiscal year ending December 31, 2023.

Assumptions and methods for other postretirement benefit cost purposes

Actuarial Assumptions and methods – Other Postretirement Benefit Costs

Economic Assumptions

Discount rate:

- | | |
|--|-------|
| • Administrative Medical and Dental Plan | 5.30% |
| • Non-Administrative Medical and Dental Plan | 5.55% |
| • Retiree Life Insurance Plan | 5.30% |

Expected rate of return on assets

- | | |
|---------------|-------|
| • Fiscal 2023 | 5.50% |
|---------------|-------|

The return on assets shown above is net of investment expenses and administrative expenses assumed to be paid from the trust.

Demographic and Other Assumptions

Inclusion date	The valuation date coincident with or next following the date on which the employee becomes a participant.
New or rehired employees	It was assumed there will be no new or rehired employees.
Covered pay	Assumed plan compensation for the year beginning on the valuation date was determined as actual gross earnings during the prior year provided by the employer

Participation Assumptions	Current Retirees	Future Retirees	
Participation:	Based on valuation census data	Percentages of eligible individuals electing coverage	
		<u>Participant</u>	<u>Spouse</u>
• Medical			
– Pre-65		100%	100%
– Post-65		100%	100%
• Dental			
– Pre-65		100%	100%
– Post-65		100%	100%
• Life insurance		100%	100%
Percentage of retirees covering a spouse	Based on valuation census data	80% of males; 50% of females	
Spouse age	Based on valuation census data	Wife 3 years younger than husband	
Non-spouse dependent coverage	Based on valuation census data	No participants are assumed to elect coverage for non-spouse dependents in retirement.	

Demographic Assumptions

Mortality – Healthy & Disabled

- Base table: Pri-2012 retiree and contingent annuitant tables with separate tables for males and females.
- Base mortality table year: 2012
- Table Type: No collar
- Healthy or Disabled: Healthy (Disabled for disability mortality)
- Table weighting: Benefit
- Separate rates for annuitants and non-annuitants (based on employee tables)
- Mortality improvement scale: MP-2020

Disability rates

Representative Disability Rates

Percentage assumed to become disabled during the year		
Attained Age	Males	Females
20	0.03%	0.04%
25	0.03%	0.05%
30	0.04%	0.06%
35	0.05%	0.08%
40	0.07%	0.10%
45	0.10%	0.15%
50	0.18%	0.26%
55	0.36%	0.49%
60	0.90%	1.21%
65	0.00%	0.00%

Termination

Rates Varying by Age

Percentage assumed to leave during the year		
Attained Age	Males	Females
25	5.0%	10.0%
30	4.7%	9.4%
35	3.3%	6.7%
40	1.4%	2.7%
45	0.6%	1.2%
50	0.2%	0.5%
55	0.0%	0.0%
60	0.0%	0.0%

Retirement

Representative Retirement Rates

Percentage assumed to retire during the year		
Age	Administrative	Non-Administrative
55	5%	5%
56	5%	5%
57	5%	5%
58	15%	20%
59	10%	15%
60	20%	30%
61	20%	40%
62	60%	80%
63	30%	50%
64	50%	50%
65	100%	100%

Trend Rates

Health care cost trend rate:

- Medical costs for Pre-Medicare and Medicare eligible retirees 6.75% in 2023 reducing 0.25% for 7 years, reaching 5.00% in 2030 and after
- Dental care cost trend rate 5.00%

Participant contribution trend rates:

- Medical costs Same as applicable medical plan trend rate
- Dental Same as dental plan trend rate

Medicare Part D Assumptions

Eligibility for Medicare Part D subsidy The plan for Medicare eligible participants is a Fully Insured Medicare Advantage plan and does not qualify for the Part D subsidy.

Medicare Part D subsidy value N/A

Per Capita Claims Costs and Retiree Contributions

Basis for per capita claim cost and retiree contribution assumptions

The average annual per capita health rates for 2023 are shown below. Best estimate assumptions developed based on insurance premiums, adjusted where appropriate for the effect of aging.

Effective in 2021, UPPCO changed carriers to Humana and in doing so is experiencing a large drop in premium rates. It is unclear at this point in time the extent to which these lower premium rates reflect the best long-term estimate of the cost structure of the plan. For this reason, in setting the claim cost assumption for 2023, a margin was added to both pre and post 65 claim costs. The margins were 50% for pre-65 and 18% for post-65. For consistency, these same margins were also added to the retiree contribution rates for purposes of performing the valuation of obligations. In future years, we will continue to monitor the premium rates for these plans to determine the extent to which this kind of margin continues to be appropriate.

	PPO	Benistar	Dental
<50	\$ 6,555	N/A	\$ 512
50 – 54	\$ 8,049	N/A	\$ 512
55 – 59	\$ 9,664	N/A	\$ 512
60 – 64	\$ 11,959	N/A	\$ 512
65 or Older	\$ 3,136	\$ 3,782	\$ 512

Retiree contribution assumption for 2023 are shown below:

Age	PPO	Benistar	Dental
Prior to 65	\$ 11,250	N/A	\$ 512
65 or Older	\$ 3,136	\$ 3,782	\$ 512

Additional Assumptions

Administrative expenses

Return on asset assumption is net of any expense paid by the trust. It is assumed that administrative expenses will reduce the rate of return on assets 0.25% for the VEBA and 0.45% for the 401(h) for fiscal 2022 and 0.25% for the VEBA and 0.75% for the 401(h) for fiscal 2023.

Cash flow

- Decrement timing
The assumptions used are collectively called rounded middle of year (rounded MOY) decrement timing. Most events are assumed to occur at the middle of year during which the eligibility condition will be met or the start/end date will occur. For death and disability decrements, the rate applied is based on the participant's rounded age (nearest integer age) at the beginning of the year, to align with the methodology generally used to create those rate tables. For retirement and withdrawal decrements, the age is generally the participant's rounded age at the middle of the year.
- Timing of benefit payments
Annuity payments are payable monthly at the beginning of the month and lump sum payments are payable on date of decrement.

Methods – Other Postretirement Benefit Cost and Funded Position

Census date January 1, 2023

Measurement date January 1, 2023

Service cost and accumulated postretirement benefit obligation

Costs are determined using the Projected Unit Credit Cost Method. The annual service cost is equal to the present value of the portion of the projected benefit attributable to service during the upcoming year, and the Accumulated Postretirement Benefit Obligation (APBO) is equal to the present value of the portion of the projected benefit attributable to service before the measurement date. Service from the beginning of the attribution period through the expected full eligibility date is counted in allocating costs.

For Administrative employees hired prior to January 1, 2008, the beginning of the attribution period is the later of age 45 and January 1, 2013. The full eligibility date is the date the employee is eligible to retire with at least 10 years of continuous service after age 45.

For Administrative employees hired on or after January 1, 2008, the beginning of the attribution period is the later of date of hire and age 45. The full eligibility date is the date the employee is eligible to retire with at least 10 years of continuous service after age 45.

For the Non-Administrative plan and Retiree Life Insurance plan, the beginning of the attribution period is date of hire. The full eligibility date is age 55 with 10 years of service.

Market-related value of assets

- The fair value of assets on the measurement date, less the unrecognized portion of the returns net of interest and dividends on the fair value of assets. The following percentages are considered for this purpose
 - 80% of the first preceding 12 months
 - 60% of the second preceding 12 months
 - 40% of the third preceding 12 months
 - 20% of the fourth preceding 12 months
- The smoothing method has a bias to produce a market-related value of assets that is below the fair value of assets.

Methods – Other Postretirement Benefit Cost and Funded Position (continued)

Amortization of unamortized amounts:

- | | |
|---|--|
| <ul style="list-style-type: none"> • Transition obligation (asset) | <p>Not applicable</p> |
| <ul style="list-style-type: none"> • Past service cost (credit) | <p>Amortization of net prior service cost/(credit) resulting from a plan change is included as a component of Net Periodic Benefit Cost/(Income) in the year first recognized and every year thereafter until such time as it is fully amortized. The annual amortization payment is determined in the first year as the increase in APBO due to the plan change divided by the average remaining service period of participating employees expected to receive benefits under the plan.</p> <p>However, when the plan change reduces the APBO, existing positive prior service costs are reduced or eliminated on a pro-rata basis before a new prior service credit is established.</p> |
| <ul style="list-style-type: none"> • Net loss (gain) | <p>Amortization of the net gain or loss resulting from experience different from the assumed and from changes in assumptions (excluding asset gains and losses not yet reflected in market-related value) is included as a component of Net Periodic Benefit Cost/(Income) for a year.</p> <p>If, as of the beginning of the year, that net gain or loss exceeds 10% of the greater of the APBO and the market-related value of assets, the amortization is that excess divided by the average remaining service period of participating employees expected to receive benefits under the plan. For the Retiree Life Insurance plan average remaining lifetime is used instead of average remaining service.</p> |

Under this methodology, the gain/loss amounts recognized in AOCI are not expected to be fully recognized in benefit cost until the plan is terminated (or an earlier event, like a settlement triggers recognition) because the average expected remaining service of active participants expected to benefit under the plan over which the amounts are amortized is redetermined each year and amounts that fall within the corridor described above are not amortized. For the Retiree Life Insurance plan average remaining lifetime is used instead of average remaining service.

Benefits not valued

All benefits described in the Plan Provisions section of this report were valued. Willis Towers Watson has reviewed the plan provisions with the Plan Sponsor and, based on that review, is not aware of any other significant benefits required to be valued that were not.

Source of Prescribed Methods

Accounting methods

The methods used for accounting purposes as described in Appendix A, including the method of determining the market-related value of plan assets are “prescribed methods set by another party”, as defined in the actuarial standards of practice (ASOPs). As required by U.S. GAAP, these methods were selected by the plan sponsor.

Assumptions Rationale - Significant Economic Assumptions

Discount rate

As required by U.S. GAAP, the discount rate was chosen by the plan sponsor based on market information on the measurement date. The rate derived from market information is rounded to 5 basis points. Based on Willis Towers Watson’s interest rate model, RATE:Link, that uses a yield curve derived from current, high quality (rated AA and above) corporate bonds to discount expected pension cash flows, and thus determine discount rates, we believe the discount rate chosen does not significantly conflict with what would be reasonable.

Expected return on plan assets

We understand that the expected return on assets assumption reflects the plan sponsor's estimate of future experience for trust asset returns, reflecting the plan's current asset allocation and any expected changes during the current plan year, current market conditions and the plan sponsor's expectations for future market conditions. The analysis was informed by analysis of investment managers and recent trends for CPI, GDP growth, and real returns on the various classes of assets held by the trust. Willis Towers Watson's determination that this assumption does not significantly conflict with what would be reasonable is informed by Willis Towers Watson's Expected Return Estimator model.

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, leading to select and ultimate assumed trend rates. 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 reasonably 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 and all of the factors described above, 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 reasonably consistent with other economic assumptions used, other than the discount rate.

Participant contribution trend rates

In accordance with the substantive plan communicated to participants, participant contributions are intended to remain a fixed percentage of total plan costs, and thus the trend rates, and the description of the derivation of the trend rates, are the same as for claims costs as shown above. We believe this assumption does not significantly conflict with what would be reasonable based on the considerations mentioned above, and current and historical trend rates and their variability, and that this assumption is reasonably consistent with the terms of the substantive plan and the other assumed economic assumptions, other than the discount rate.

Medicare Part D subsidy trend rates

Not applicable

Per capita claims costs Per capita claims costs were chosen by the plan sponsor based on premiums set by Humana in the plan year beginning on the measurement date (with any expected changes in future years reflected in the trend rate assumption). We believe the per capita claims cost assumptions do not significantly conflict with what would be reasonable.

Medicare Part D subsidy value Not applicable

Assumptions Rationale - Significant Demographic Assumptions

Healthy Mortality Assumptions used for accounting purposes were selected by the plan sponsor and, as required by U.S. GAAP, represent a best estimate of future experience. We believe the assumptions do not significantly conflict with what would be reasonable because they reflect recent experience and are adjusted to reflect the plan sponsor's expectations regarding future mortality improvement.

Disabled Mortality Assumptions used for accounting purposes were selected by the plan sponsor and, as required by U.S. GAAP, represents a best estimate of future experience. For the reasons described above, we believe the assumptions do not significantly conflict with what would be reasonable.

Termination Termination rates were set several years ago based on historical experience and no significant gains or losses have been observed due to actual termination experience different than expected. For the reasons discussed above, we believe the assumptions selected do not significantly conflict with what would be reasonable.

Disability Disability rates are based on a standard UAW table. Actual experience is not credible to set plan specific rates. For the reasons discussed above, we believe the assumptions selected do not significantly conflict with what would be reasonable.

Retirement Retirement rates were set several years ago based on historical experience and no significant gains or losses have been observed due to actual retirement experience different than expected. For the reasons discussed above, we believe the assumptions selected do not significantly conflict with what would be reasonable.

Participation:

- Participants Assumed participation rates reflect historical experience as well as anticipated future experience.
 - Covered spouses Assumed coverage rates for spouses reflect historical experience as well as anticipated future experience.
- For the reasons discussed above, we believe the assumption does not significantly conflict with what would be reasonable.

Benefit commencement date:

- Retiree benefit Retirees are assumed to begin benefits immediately on eligible retirement because experience shows that retirees who enroll tend to do so immediately. For the reasons discussed above, we believe the assumption does not significantly conflict with what would be reasonable.

Marital Assumptions:

- Percent married The assumed percentage married is based on general population statistics on the marital status of individuals of retirement age. For the reasons discussed above, we believe the assumption does not significantly conflict with what would be reasonable.
- Spouse age The assumed age difference for spouses is based on general population statistics of the age difference for married individuals of retirement age. For the reasons discussed above, we believe the assumption does not significantly conflict with what would be reasonable.

Sources of Data and Other Information

The plan sponsor furnished participant data and claims data as of January 1, 2023. Information on assets, contributions and plan provisions was supplied by the plan sponsor. Data and other information were reviewed for reasonableness and consistency, but no audit was performed. Based on discussions with the plan sponsor, assumptions or estimates were made when data were not available, and the data was adjusted to reflect any significant events that occurred between the date the data was collected and the measurement date. In consultations with the Company, the following assumptions were made for missing or apparently inconsistent data elements: for missing beneficiary dates of birth, females were assumed to be 3 years younger than males; for missing beneficiary sexes, male participants were assumed to have a female beneficiary and female participants were assumed to have a male beneficiary.

Accumulated other comprehensive (income)/loss amounts shown in the report are shown prior to adjustment for deferred taxes. Any deferred tax effects in AOCI should be determined in consultation with the Company's tax advisors and auditors. WTW used information supplied by the Company regarding the amounts recognized in accumulated other comprehensive income as of the end of the 2022 fiscal year and amounts recognized in other comprehensive income in the 2022 fiscal year.

We are not aware of any errors or omissions in the data that would have a significant effect on the results of our calculations.

Changes in Assumptions, Methods and Estimation Techniques

Changes in Assumptions	<ul style="list-style-type: none"> The discount rate for each plan was updated to reflect current market conditions. <ul style="list-style-type: none"> UPPCO Administrative Medical and Dental Plan from 2.45% to 5.30% UPPCO Non-Administrative Medical and Dental Plan from 3.10% to 5.55% UPPCO Retiree Life Insurance Plan from 2.70% to 5.30% The claims cost and retiree premiums were updated based on actual 2023 information provided by the vendors. The expected return on assets assumption was updated from 4.50% for the 2022 fiscal year to 5.50% for the 2023 fiscal year to better reflect current market conditions.
Changes in Methods	None
Changes in Estimation Techniques	None

Model Descriptions and Disclosures in accordance with ASOP No. 56

Quantify

Quantify is the Willis Towers Watson centrally developed, tested and maintained Global actuarial valuation system. It is used to perform valuations of clients' benefit plans.

Quantify provides the ability to process data, calculate benefits and value benefit liabilities, develop results using applicable standards, and generate client reports.

Quantify parameters provide significant flexibility to model populations and plan designs. Various demographic, economic and benefit related assumptions exist for users to model multiple demographic and economic situations.

Plan liabilities are calculated based on standard actuarial techniques, developing actuarially reasonable results using the population and parameters entered. The calculation and presentation of liabilities in Quantify relies on the assumptions used and the reasonability of the assumptions selected.

Quantify incorporates standard liability methodologies that are intended to reasonably reflect a variety of economic or demographic conditions. The model itself does not evaluate any assumptions entered for reasonableness, consistency or probability of occurrence.

Quantify is designed specifically for these purposes, and we know of no material limitations that would prevent the system from being suitable for these intended purposes. The actuaries signing this report have relied on the actuaries who develop, test and maintain this system, and have also performed a limited review of results to ensure that system parameters have been set appropriately and plan provisions coded correctly.

Quantify FR

Quantify Financial Reporting (FR) is intended to calculate funding results, accounting results and produce the associated client reports under selected accounting standards. The calculations and reports are based on various user specified inputs including liability results and asset values.

Quantify FR develops valuation results for various accounting and funding purposes using standard actuarial techniques.

Calculation of disclosure liabilities and results may be based on roll forward liabilities.

Liability roll-forwards are used in accounting scenarios where the date as of which liabilities are valued does not coincide with the fiscal year measurement date. The roll-forwards consist of adjusting liabilities for the passage of time.

The estimate of the following year's expense is calculated based on the obligations and assets used for disclosure and incorporates service cost that may be based on a projection in the associated Quantify liability run, depending on the relationship of the liability valuation date to the fiscal year.

The Roll Forward accounting calculations assume that applicable rules will not change during the roll-forward period. Actuaries make adjustments to the data, plan provisions and assumptions reflected in the calculation of the liabilities that are rolled forward so that the results reflect conditions at the measurement date, and/or make similar adjustments to the results of the roll forward, including reflecting any changes in applicable accounting standards.

RATE:Link/RateCalc

RATE:Link is a methodology to develop spot rates to be used for liability and cost measurements related to employee benefit plans. The same core methodology is used to develop all RATE:Link curves. The RATE:Link process develops term structures of interest rates from corporate bond data for each covered geography (e.g., the U.S.) for this valuation).

The construction of RATE:Link yield curves relies on bond data collected as of the measurement date.

Information regarding quoted bond prices, yields and other bond related data is from Bloomberg Finance L.P.

RateCalc is used as one component in developing the single equivalent discount rate that reflects the characteristics of the client's employee benefit plan. It references a yield curve (often a RATE:Link curve) and expected plan benefit payments. The projected benefit payments from the client's plan are matched to the spot rates along the yield curve to determine their present values. A single equivalent discount rate is then solved for, which produces the same total present value as the spot rates.

Expected Return Estimator

The Expected Return Estimator is used to help inform the choice of an expected return assumption (e.g., as one data point to consider) for returns on the assets of the trust.

The tool depends on the capital market assumptions chosen at the starting date of the simulation. These assumptions reflect currently prevailing capital market conditions, assumed future conditions ("normative conditions"), and the transition from the current conditions to the normative ones.

The assumed normative conditions incorporate a blend of historical capital market data and future expectations. The sources consulted in the determination of normative levels include practitioners in our global actuarial and investment consulting practices, plan sponsors, investment managers, economists, and academics.

**Published Demographic
Tables**

Certain demographic tables described above are standard published tables or are based on standard published tables from models developed by organizations with the requisite expertise.

AgeDist

AgeDist is a spreadsheet tool that applies relative cost factors by age to average per capita costs (pre- and post-65) and census weights to produce age-graded plan costs for pre- and post-65 populations. The average per capita costs and census weights are provided as inputs to the tool, which is then combined with a morbidity curve to produce a set of weighted average age-related costs that equal the average. The age-graded costs are used in the actuarial valuation.

The morbidity curve was developed from a broad set of claims data aggregated by age and blended and may not reflect your specific morbidity. The model does not evaluate the average per capita costs or census weights for reasonableness or consistency.

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Appendix B : Summary of principal other postretirement benefit plan provisions

Substantive Plan Provisions – UPPCO Administrative Retiree, LTD and Surviving Spouse Medical & Dental

Medical Benefits

Eligibility Employees are eligible upon retirement and completion of 3 years of service after attaining age 45.

Medical benefit

Post January 1, 2013 retirees

Employees who retire after January 1, 2013 will receive a \$4,000 retiree medical contribution credit (RMCC) for each year of service earned after the later of age 45 and date of hire (but no earlier than January 1, 2013 for those hired prior to January 1, 2008). RMCC are used to offset the premiums of company-sponsored health plans in retirement.

Pre January 1, 2013 retirees

Employees who retired prior to January 1, 2001 pay 50% of benefit cost. Employees who retire on or after January 1, 2001 pay the full cost for their retiree medical.

A grandfathered group of participants participate in a Medigap plan sponsored by Benistar.

Retiree contributions

Refer to Methods and Assumptions for the premiums paid

Deductible

PPO (single/family)

\$500/\$1,000

MAPD PPO (per individual)

\$250

Coinsurance

PPO

80%

MAPD PPO

90%

Out-of-pocket maximum (includes deductible)

PPO (single/family)

\$3,000/\$6,000

MAPD PPO (per individual)

\$2,000

Prescription drug copayments

PPO (Pre-65)

\$15

\$50

50% (\$70 min - \$100 max)

MAPD PPO

\$1

\$20

\$50

– Generic

– Brand

– Non-Preferred

Lifetime benefit maximum Unlimited

Benistar A small group of current retirees are eligible for the “Benistar” plan which has a \$100 deductible and 80% coinsurance. Retail Rx copays for this option are \$10 generic/\$25 brand formulary/\$40 non-formulary. Mail-order Rx copays are double these amounts.

Dental Benefits

Eligibility Employees who retire prior to January 1, 2013 are eligible upon retirement and attaining age 55 and 5 years of service.

All other employees retiring on or after January 1, 2013 will not be eligible for retiree dental benefits.

Benefits Employees who retired before January 1, 2001 do not receive a dental benefit. Those who retire after January 1, 2001 pay the full cost.

Retiree contributions Refer to methods and assumptions

Deductible \$50 per person/\$150 per family

Annual maximum \$1,500 per participant

Coverage Preventative care services: Covered at 100%; no deductible
 Basic services: Covered at 80%; after deductible
 Major services: Covered at 50% after deductible
 Orthodontia services (for dependent children under age 19 only):
 – Covered at 50% after deductible
 – Lifetime maximum of \$2,000

Future Plan Changes

None.

Changes in Benefits Valued

None.

Substantive Plan Provisions – UPPCO Non-Administrative Retiree, LTD and Surviving Spouse Medical & Dental

Medical Benefits

Eligibility Age 55 and 10 years of service, or 85 points.

Medical benefit Employees receive fully subsidized benefits for a period of 3 years (or until age 65, if earlier), after which employees pay 50% of benefit cost (for all covered persons). A covered spouse of a retiree who dies is required to pay 50% of benefit cost following the death of the retiree.

A grandfathered group of participants participate in a Medigap plan sponsored by Benistar.

Former UPPCO term vested employees who were “grandfathered” continue accruing age plus service toward 85 points, and may have access to UPPCO retiree coverage when they reach 85 points and begin drawing their UPPCO pension benefit. A “Grandfathered” employee is someone who was employed by UPPCO on January 1, 1994 and whose combined age and years of service total 55 or more.

Retiree contributions Refer to Methods and Assumptions for the premiums paid

Deductible	PPO (single/family)	MAPD PPO (per individual)
	\$500/\$1,000	\$250

Coinsurance	PPO	MAPD PPO
	80%	90%

Out-of-pocket maximum (includes deductible)	PPO (single/family)	MAPD PPO (per individual)
	\$3,000/\$6,000	\$2,000

Prescription drug copayments	PPO (Pre 65)	MAPD PPO
– Generic	\$15	\$1
– Brand	\$50	\$20
– Non-Preferred	50% (\$70 min - \$100 max)	\$50

Lifetime benefit maximum Unlimited

Benistar A small group of current retirees are eligible for the “Benistar” plan which has a \$100 deductible and 80% coinsurance. Retail Rx copays for this option are \$10 generic/\$25 brand formulary/\$40 non-formulary. Mail-order Rx copays are double these amounts.

Dental Benefits

Eligibility	Age 55 and 10 years of service, or 85 points.
Retiree contributions	Refer to methods and assumptions
Deductible	\$50 per person/\$150 per family
Annual maximum	\$1,500 per participant
Coverage	<p>Preventative care services: Covered at 100%; no deductible</p> <p>Basic services: Covered at 80%; after deductible</p> <p>Major services: Covered at 50% after deductible</p> <p>Orthodontia services (for dependent children under age 19 only):</p> <ul style="list-style-type: none">– Covered at 50% after deductible– Lifetime maximum of \$2,000

Future Plan Changes

None.

Changes in Benefits Valued

None.

Substantive Plan Provisions – UPPCO Postretirement Life Insurance and Survivor Income Benefit

Life Insurance Benefits

Eligibility

Non-Administrative

Age 55 and 10 years of service, or 85 points, who retire prior to May 1, 2018.

Administrative

Age 55 and 5 years of service for employees hired on or before December 31, 2000 who retire prior to January 1, 2013.

Benefit

Non-Administrative

Employees Group Life-Company Paid

Benefits into retirement if:

- Insured for a minimum of 10 years.

Benefit amount into retirement:

- \$15,000.

UPPCO terminated vested and Presque Isle grandfathered participants are generally not eligible for retiree life insurance.

Administrative Employees

Life Insurance – \$7,000 Non-Contributory Life Insurance for employees hired on or before December 31, 2000. Employees retiring on or after January 1, 2013 will not be eligible for life insurance.

Some UPPCO Grandfathered retirees have a different life insurance amount that varies by individual.

Future Plan Changes

None.

Changes in Benefits Valued

None.

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Appendix C : Accounting exhibits by plan

C.1 Summary of key results for period beginning January 1, 2023

All monetary amounts shown in US Dollars

		Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
Benefit Cost/(Income)	Net Periodic Postretirement Benefit Cost/(Income)	(1,759,644)	51,827	(1,901,158)	89,687
	Benefit Cost/(Income) due to Special Events	0	0	0	0
	Total Benefit Cost/(Income)	(1,759,644)	51,827	(1,901,158)	89,687
Plan Assets	Fair Value of Plan Assets (FVA)	25,320,058	1,322,368	23,975,447	22,243
	Market Related Value of Plan Assets (MRVA)	28,863,964	1,607,729	27,237,066	19,169
	Return on Fair Value of Plan Assets during Prior Year	(18.72%)	(22.70%)	(18.47%)	(20.63%)
Benefit Obligations	Accumulated Postretirement Benefit Obligation (APBO)	(13,195,115)	(1,232,350)	(10,499,529)	(1,463,236)
Funded Ratio	Fair Value of Plan Assets to APBO	191.8%	107.3%	228.3%	1.5%
Accumulated Other Comprehensive (Income)/Loss (Pre-tax)	Net Prior Service Cost/(Credit)	(1,608,669)	5,673	(1,492,157)	(122,185)
	Net Loss/(Gain)	(10,387,722)	513,368	(11,364,998)	463,908
	Total Accumulated Other Comprehensive (Income)/Loss	(11,996,391)	519,041	(12,857,155)	341,723

		Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
Assumptions	Discount Rate	5.50%	5.30%	5.55%	5.30%
	Expected Long-Term Rate of Return on Plan Assets	5.50%	5.50%	5.50%	5.50%
	Current Health Care Cost Trend Rate	6.75%	6.75%	6.75%	N/A
	Ultimate Health Care Cost Trend Rate	5.00%	5.00%	5.00%	N/A
	Year of Ultimate Trend Rate	2030	2030	2030	N/A
<hr/>					
Participant Data	Census Date	01/01/2023	01/01/2023	01/01/2023	01/01/2023
<hr/>					

C.2 Participant information

All monetary amounts shown in US Dollars

		Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
Census Date		N/A	01/01/2023	01/01/2023	01/01/2023
Participating Employees	Number of Fully Eligible	11	0	11	0
	Number of Other	165	82	83	0
	Total Number	176	82	94	0
	Average Age	43.18	44.02	42.45	0.00
	Average Service	9.58	8.36	10.65	0.00
Retirees, Surviving Spouses and Surviving Dependents	Retirees	277	19	100	158
	Average Age for Retirees	76.66	79.89	74.99	77.33
	Surviving Spouses and Surviving Dependents	48	22	26	0
	Average Age of Surviving Spouses and Surviving Dependents	83.70	85.86	81.88	0.00
	Total retirees, surviving spouses and surviving dependents	325	41	126	158

C.3 Balance sheet asset/(liability) at January 1, 2023

All monetary amounts shown in US Dollars

	Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
A Development of Balance Sheet Asset/(Liability)				
1 Accumulated postretirement benefit obligation (APBO)	(13,195,115)	(1,232,350)	(10,499,529)	(1,463,236)
2 Fair value of plan assets (FVA)	25,320,058	1,322,368	23,975,447	22,243
3 Net balance sheet asset/(liability)	12,124,943	90,018	13,475,918	(1,440,993)
B Current and Noncurrent Classification				
1 Noncurrent asset	13,565,936	90,018	13,475,918	0
2 Current liability	(95,956)	0	0	(95,956)
3 Noncurrent liability	(1,345,037)	0	0	(1,345,037)
4 Net balance sheet asset/(liability)	12,124,943	90,018	13,475,918	(1,440,993)
C Accumulated Other Comprehensive (Income)/Loss				
1 Net prior service cost/(credit)	(1,608,669)	5,673	(1,492,157)	(122,185)
2 Net loss/(gain)	(10,387,722)	513,368	(11,364,998)	463,908
3 Accumulated other comprehensive (income)/loss	(11,996,391)	519,041	(12,857,155)	341,723
D Assumptions and Dates				
1 Discount rate	5.50%	5.30%	5.55%	5.30%
2 Current health care cost trend rate	6.75%	6.75%	6.75%	N/A
3 Ultimate health care cost trend rate	5.00%	5.00%	5.00%	N/A
4 Year ultimate trend rate is reached	2030	2030	2030	N/A
5 Census date	01/01/2023	01/01/2023	01/01/2023	01/01/2023

C.4 Changes in liabilities and assets for period beginning January 1, 2023

All monetary amounts shown in US Dollars

	Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
A Change in Accumulated Postretirement Benefit Obligation (APBO)				
1 APBO at beginning of prior fiscal year	19,737,101	1,479,328	16,325,195	1,932,578
2 Employer service cost	905,405	111,098	794,307	0
3 Interest cost	610,983	37,050	523,358	50,575
4 Actuarial loss/(gain)	(7,370,214)	(281,991)	(6,740,843)	(347,380)
5 Plan participants' contributions	449,488	165,994	283,494	0
6 Benefits paid from plan assets	(1,137,648)	(279,129)	(685,982)	(172,537)
7 Benefits paid from Company assets	0	0	0	0
8 Medicare Part D subsidy	0	0	0	0
9 Administrative expenses paid	0	0	0	0
10 Plan amendments	0	0	0	0
11 Acquisitions/(divestitures)	0	0	0	0
12 Curtailments	0	0	0	0
13 Settlements	0	0	0	0
14 Special/contractual termination benefits	0	0	0	0
15 APBO at beginning of current fiscal year	13,195,115	1,232,350	10,499,529	1,463,236
B Change in Plan Assets				
1 Fair value of plan assets at beginning of prior fiscal year	31,866,704	1,822,757	29,822,496	221,451
2 Actual return on plan assets	(5,905,379)	(402,786)	(5,474,561)	(28,032)
3 Employer contributions	46,893	15,532	30,000	1,361
4 Plan participants' contributions	449,488	165,994	283,494	0
5 Benefits paid	(1,137,648)	(279,129)	(685,982)	(172,537)
6 Administrative expenses paid	0	0	0	0
7 Acquisitions/(divestitures)	0	0	0	0
8 Settlements	0	0	0	0
9 Fair value of plan assets at beginning of current fiscal year	25,320,058	1,322,368	23,975,447	22,243

C.5 Summary of net balances at January 1, 2023

All monetary amounts shown in US Dollars

	Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
Amortization Details of Plan Amendment #1				
1 Measurement date established	N/A	01/01/2014	01/01/2014	12/31/2018
2 Net amount at 01/01/2023	N/A	0	(1,492,157)	(122,185)
3 Remaining amortization period	N/A	0	2.34166	8.78754
4 Amortization amount in 2023	N/A	0	637,221	13,905
5 Effect of curtailments	N/A	0	0	0
6 Other events	N/A	0	0	0
Amortization Details of Plan Amendment #2				
1 Measurement date established	N/A	12/31/2015	0	0
2 Net amount at 01/01/2023	N/A	(149,806)	0	0
3 Remaining amortization period	N/A	3.76124	0	0
4 Amortization amount in 2023	N/A	39,830	0	0
5 Effect of curtailments	N/A	0	0	0
6 Other events	N/A	0	0	0
Amortization Details of Plan Amendment #3				
1 Measurement date established	N/A	12/31/2019	0	0
2 Net amount at 01/01/2023	N/A	155,479	0	0
3 Remaining amortization period	N/A	11.41753	0	0
4 Amortization amount in 2023	N/A	(13,617)	0	0
5 Effect of curtailments	N/A	0	0	0
6 Other events	N/A	0	0	0

		Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
A	Summary of Net Prior Service Cost/(Credit)				
1	Net amount at 01/01/2023	(1,608,669)	5,673	(1,492,157)	(122,185)
2	Amortization amount during 2023	677,339	26,213	637,221	13,905
3	Plan amendments	0	0	0	0
4	Effect of curtailments	0	0	0	0
5	Other events	0	0	0	0
B	Summary of Net Loss/(Gain)				
1	Net amount at 01/01/2023	(10,387,722)	513,368	(11,364,998)	463,908
2	Amount recognized during 2023	746,537	(7,971)	784,172	(29,664)
3	Effect of curtailments	0	0	0	0
4	Effect of settlements	0	0	0	0
5	Other events	0	0	0	0

C.6 Development of plan assets for benefit cost

All monetary amounts shown in US Dollars

	Total	UPPCO Admin Med	UPPCO Non-Admin Med	UPPCO Life Insurance
Fiscal Year Ending	12/31/2022	12/31/2022	12/31/2022	12/31/2022
A Development of Market-Related Value of Assets – Total				
1 Fair value of assets at current fiscal year end	25,320,058	1,322,368	23,975,447	22,243
2 Deferred investment gains/(losses) for prior periods				
Fiscal Year Gain/(Loss)				
a 12/31/2022	(7,192,792)	(476,436)	(6,682,640)	(33,716)
b 12/31/2021	1,268,707	(27,110)	1,282,772	13,045
c 12/31/2020	2,283,753	177,712	2,078,337	27,704
d 12/31/2019	2,678,007	204,844	2,417,473	55,690
e 12/31/2018	(2,282,004)	(170,851)	(2,054,281)	(56,872)
Percent Deferred				
a 12/31/2022	80%	80%	80%	80%
b 12/31/2021	60%	60%	60%	60%
c 12/31/2020	40%	40%	40%	40%
d 12/31/2019	20%	20%	20%	20%
e 12/31/2018	0%	0%	0%	0%
Deferred Amount				
a 12/31/2022	(5,754,234)	(381,149)	(5,346,112)	(26,973)
b 12/31/2021	761,224	(16,266)	769,663	7,827
c 12/31/2020	913,502	71,085	831,335	11,082
d 12/31/2019	535,602	40,969	483,495	11,138
e 12/31/2018	0	0	0	0
3 Market-related value of assets	28,863,964	1,607,729	27,237,066	19,169

C.7 Summary and comparison of benefit cost and cash flows

All monetary amounts shown in US Dollars

	Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
A Total Benefit Cost for Fiscal Year Ending 12/31/2023				
1 Employer service cost	501,928	89,175	412,753	0
2 Interest cost	733,754	66,351	593,024	74,379
3 Expected return on plan assets	(1,571,450)	(85,457)	(1,485,542)	(451)
4 Subtotal	(335,768)	70,069	(479,765)	73,928
5 Net prior service cost/(credit) amortization	(677,339)	(26,213)	(637,221)	(13,905)
6 Net loss/(gain) amortization	(746,537)	7,971	(784,172)	29,664
7 Subtotal	(1,423,876)	(18,242)	(1,421,393)	15,759
8 Net periodic postretirement benefit cost/(income)	(1,759,644)	51,827	(1,901,158)	89,687
9 Curtailment (gain)/loss	0	0	0	0
10 Settlement (gain)/loss	0	0	0	0
11 Special/contractual termination benefits	0	0	0	0
12 Total benefit cost	(1,759,644)	51,827	(1,901,158)	89,687
B Assumptions				
1 Discount rate	5.50%	5.30%	5.55%	5.30%
2 Expected long-term rate of return on plan assets	5.50%	5.50%	5.50%	5.50%
3 Current health care cost trend rate	6.75%	6.75%	6.75%	N/A
4 Ultimate health care cost trend rate	5.00%	5.00%	5.00%	N/A
5 Year ultimate trend rate is reached	2030	2030	2030	N/A
6 Census date	01/01/2023	01/01/2023	01/01/2023	01/01/2023
C Assets at Beginning of Year				
1 Fair value	25,320,058	1,322,368	23,975,447	22,243
2 Market-related value	28,863,964	1,607,729	27,237,066	19,169

		Total	UPPCo Admin Med	UPPCo Non-Admin Med	UPPCo Life Insurance
D Cash Flows Net of Medicare Part D Subsidy					
1	Expected				
a	Employer contributions	0	0	0	0
b	Plan participants' contributions	0	0	0	0
c	Benefits paid from Company assets	130,703	31,655	0	99,048
d	Benefits paid from plan assets	592,199	109,384	460,572	22,243
2	Actual				
a	Employer contributions	46,893	15,532	30,000	1,361
b	Plan participants' contributions	449,488	165,994	283,494	0
c	Benefits paid from Company assets	0	0	0	0
d	Benefits paid from plan assets	1,137,648	279,129	685,982	172,537
E Amortization Period					
1	For gain/loss amortization, if applicable	N/A	8.43433	15.17896	10.80975

Upper Peninsula Power Company

Consolidated Actuarial Valuation Report
Benefit Cost for Fiscal Year Beginning
January 1, 2023 under US GAAP

August 2023

wtwco.com

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Purposes of valuation

Upper Peninsula Power Company (the Company) engaged Willis Towers Watson US LLC ("WTW") to value the Company's pension plans.

As requested by the Company, this report documents the results of an actuarial valuation of the Plans:

- Upper Peninsula Power Company Retirement Plan
- Upper Peninsula Power Company Pension Restoration Plan
- Upper Peninsula Power Company Pension SERP

The primary purpose of this valuation is to determine the Net Periodic Benefit Cost/(Income) (Benefit Cost), in accordance with FASB Accounting Standards Codification Topic 715 (ASC 715) for the fiscal year ending December 31, 2023. It is anticipated that a separate report will be prepared for year-end financial reporting purposes.

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. The expected contributions to the qualified pension plan were set at \$0.

Note that any significant change in the amounts contributed or expected to be contributed in 2023 from what is disclosed at December 31, 2022 may require disclosure in the interim financial statements, but should not affect the expected return on plan assets absent a remeasurement for another purpose.
2. There may be certain events that have occurred since the valuation date that are not reflected in the current valuation. See Subsequent Events in the Basis for Valuation section below for more information.
3. This report is not intended to constitute a certification of the Adjusted Funding Target Attainment Percentage (AFTAP) under IRC §436 for any plan year.
4. This report does not determine funding requirements under IRC §430.
5. This report does not provide information for plan accounting and financial reporting under ASC 960.
6. This report does not present liabilities on a plan termination basis, for which a separate extensive analysis would be required. No funded status measure included in this report is intended to assess, and none may be appropriate for assessing, the sufficiency of plan assets to cover the estimated cost of settling benefit obligations, as all such measures differ in some way from plan termination obligations. In addition, funded status measures shown in this report do not reflect the current costs of settling obligations by offering immediate lump sum payments to participants and/or purchasing annuity contracts for the remaining participants (e.g., insurer profit, insurer pricing of contingent benefits and/or provision for anti-selection in the choice of a lump sum vs. an annuity).
7. The comparisons of plan obligations as determined for accounting and financial reporting purposes to plan assets presented in this report cannot be relied upon to determine the need for nor the

amount of required future plan contributions. Nevertheless, such comparisons may be useful to assess the need for future contributions because they reflect current interest rates at the measurement date in determining benefit obligations. However, asset gains and losses, demographic experience different from assumed, changes in interest rates, future benefit accruals, if any, and other factors will all affect the need for and amount of future contributions. In addition, if a plan is not required by law to be funded, benefit payments may also be paid directly by the plan sponsor as they come due.

Section 1 : Summary of key consolidated results

1.1 Benefit cost, plan assets & obligations

All monetary amounts shown in US Dollars

Fiscal Year Beginning		01/01/2023	01/01/2022
Benefit Cost/ (Income)	Net Periodic Benefit Cost/(Income)	(508,679)	373,338
	Benefit Cost/(Income) due to Special Events	0	0
	Total Benefit Cost/(Income)	(508,679)	373,338
Measurement Date		01/01/2023	01/01/2022
Plan Assets	Fair Value of Plan Assets (FVA)	89,573,343	123,448,920
	Market Related Value of Plan Assets (MRVA)	109,417,407	114,713,972
	Actual Return on Fair Value of Plan Assets during Prior Year	(22.93%)	2.26%
Benefit Obligations	Accumulated Benefit Obligation (ABO)	(79,632,295)	(105,104,398)
	Projected Benefit Obligation (PBO)	(81,274,728)	(108,229,582)
Funded Ratios	Fair Value of Plan Assets to ABO	112.5%	117.4%
	Fair Value of Plan Assets to PBO	110.2%	114.1%
Accumulated Other Comprehensive (Income)/Loss (Pre-tax)	Net Prior Service Cost/(Credit)	0	0
	Net Loss/(Gain)	44,857,312	38,267,501
	Total Accumulated Other Comprehensive (Income)/Loss (pre-tax)	44,857,312	38,267,501
Assumptions	Discount rate	5.40%	2.85%
	Expected Long-Term Rate of Return on Plan Assets	5.50%	4.50%
	Rate of Compensation Increase (non-administrative)	4.00%	4.00%
Participant Data	Census Date	01/01/2023	01/01/2022

1.2 Comments on results

Change in net periodic cost and funded position

The net periodic cost decreased from \$373,338 in fiscal 2022 to \$(508,679) in fiscal 2023 and the funded position declined from \$15,219,338 to \$8,298,615.

Significant reasons for these changes include the following:

- The actual return on the fair value of plan assets since the prior measurement date was less than expected, which caused the funded position to deteriorate.
- The aggregate discount rate increased compared to the prior year, which decreased the net periodic cost and improved the funded position.
- The expected return on assets assumption increased compared to the prior year, which decreased the net periodic cost.

1.3 Basis for valuation

Appendix A summarizes the assumptions, methods and models used in the valuation. Appendix B summarizes our understanding of the principal provisions of the plans being valued. Both of these appendices include a summary of any changes since the prior valuation. Unless otherwise described below under Subsequent Events, assumptions were selected based on information known as of the measurement date.

Subsequent events

WTW is not aware of any other material events that have occurred and are not reflected in the valuation.

Additional information

None.

Actuarial certification

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

Reliances

In preparing the results presented in this report, we have relied on information regarding plan provisions, participants, assets, and sponsor accounting policies and methods provided by the Company and other persons or organizations designated by the Company. See the Sources of Data and Other Information section of Appendix A for further details. We have relied on all the data and information provided as complete and accurate. 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. The results presented in this report are directly dependent upon the accuracy and completeness of the underlying data and information. Any material inaccuracy in the data, assets, plan provisions or other information provided to us may have produced results that are not suitable for the purposes of this report and such inaccuracies, as corrected by the Company, may produce materially different results that could require that a revised report be issued.

Measurement of benefit obligations, plan assets and balance sheet adjustments

Census date/measurement date

The measurement date is January 1, 2023. The benefit obligations were measured as of January 1, 2023 and are based on participant data as of the census date, which is displayed by Plan in Appendix C.

Plan assets and balance sheet adjustments

Information about the fair value of plan assets and the general ledger account balances for the benefit plans cost at December 31, 2022, which reflect the expected funded status of the plans was reviewed for reasonableness and consistency, but no audit was performed.

Accumulated other comprehensive (income)/loss amounts shown in the report are shown prior to adjustment for tax effects. Any tax effects in AOCI should be determined by the Company in consultation with its tax advisors and independent accountants.

Assumptions and methods under U.S. GAAP

As required by U.S. GAAP, the actuarial assumptions and methods employed in the development of the benefit cost and other financial reporting have been selected by the Company. WTW has evaluated the assumptions used and believes that they do not significantly conflict with what would be reasonable. In addition, we believe that the combined effect of assumptions is expected to have no significant bias. See Appendix A for a description of each significant assumption used and our rationale for concluding that it does not significantly conflict with what would be reasonable. U.S. GAAP requires that each significant

assumption “individually represent the best estimate of a plan’s future experience solely with respect to that assumption.”

The results shown in this report have been developed based on actuarial assumptions that, to the extent evaluated by Willis Towers Watson, we believe do not significantly conflict with what would be reasonable. Other actuarial assumptions could also be considered to not significantly conflict with what would 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, methods and sources of data and other information used is provided in Appendix A. Note that any subsequent changes in methods or assumptions for the January 1, 2023 measurement date will change the results shown in this report.

Certain models (as described in ASOP No. 56) were used in preparing the information presented herein. Further information on these models can be found in Appendix A.

Nature of actuarial calculations

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 any certainty. The effects of certain plan provisions may be approximated, or determined to be insignificant and therefore not valued. 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. Any rounding (or lack thereof) used for displaying numbers in this report is not intended to imply a degree of precision, which is not a characteristic of actuarial calculations.

If overall future plan experience produces higher benefit payments or lower investment returns than assumed, the relative level of plan costs reported in this valuation will likely increase in future valuations (and vice versa). 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, changes in economic or demographic assumptions, increases or decreases 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. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

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 engagement letter dated November 16, 2020 and any accompanying or referenced terms and conditions.

The information contained in this report was prepared for the internal use of the Company and its independent accountants in connection with our actuarial valuation of the pension plans 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. The Company may distribute this actuarial valuation report to the appropriate authorities who have the legal right to require the Company to provide them this report, in which case the Company will use best efforts to notify WTW in advance of this distribution. Further distribution to, or use by, other parties of all or part of this report is expressly prohibited without WTW's prior written consent. WTW 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 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 pension plans. Our objectivity is not impaired by any relationship between the plan sponsor and our employer, Willis Towers Watson US LLC.



Georgia Louridas, FSA, EA
Director, Retirement
August 23, 2023



Tania E. Staffen, FSA, EA
Associate Director, Retirement
August 23, 2023

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Section 2 : Consolidated accounting exhibits

2.1 Balance sheet asset/(liability)

All monetary amounts shown in US Dollars

Measurement Date	01/01/2023	01/01/2022
A Development of Balance Sheet Asset/(Liability)¹		
1 Projected benefit obligation (PBO)	(81,274,728)	(108,229,582)
2 Fair value of plan assets (FVA) ²	89,573,343	123,448,920
3 Net balance sheet asset/(liability)	8,298,615	15,219,338
B Current and Noncurrent Classification³		
1 Noncurrent asset	8,703,749	15,728,646
2 Current liability	(53,660)	(44,319)
3 Noncurrent liability	(351,474)	(464,989)
4 Net balance sheet asset/(liability)	8,298,615	15,219,338
C Accumulated Benefit Obligation (ABO)	(79,632,295)	(105,104,398)
D Accumulated Other Comprehensive (Income)/Loss		
1 Net prior service cost/(credit)	0	0
2 Net loss/(gain)	44,857,312	38,267,501
3 Accumulated other comprehensive (income)/loss ⁴	44,857,312	38,267,501
E Assumptions and Dates		
1 Discount rate	5.40%	2.85%
2 Rate of compensation increase (non-administrative)	4.00%	4.00%
3 Census date	01/01/2023	01/01/2022

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

² Excludes receivable contributions.

³ The current liability (for each underfunded plan) was measured as the discounted value of benefits expected to be paid over the next 12 months in excess of the fair value of the plan's assets at the measurement date.

⁴ Amount shown is pre-tax and should be adjusted by plan sponsor for tax effects.

2.2 Changes in plan obligations and assets

All monetary amounts shown in US Dollars

Period Beginning **01/01/2023**

F Change in Projected Benefit Obligation (PBO)

1	PBO at beginning of prior fiscal year	108,229,582
2	Employer service cost	919,693
3	Interest cost	3,014,355
4	Actuarial loss/(gain)	(24,552,397)
5	Plan participants' contributions	0
6	Benefits paid from plan assets	(6,294,079)
7	Benefits paid from Company assets	(42,426)
8	Administrative expenses paid ¹	0
9	Plan amendments	0
10	Acquisitions/(divestitures)	0
11	Curtailments	0
12	Settlements	0
13	Special/contractual termination benefits	0
14	Other adjustments	0
15	PBO at beginning of current fiscal year	81,274,728

G Change in Plan Assets

1	Fair value of plan assets at beginning of prior fiscal year	123,448,920
2	Actual return on plan assets	(27,581,498)
3	Employer contributions	42,426
4	Plan participants' contributions	0
5	Benefits paid	(6,336,505)
6	Administrative expenses paid	0
7	Transfer payments	0
8	Acquisitions/(divestitures)	0
9	Settlements	0
10	Other adjustments	0
11	Fair value of plan assets at beginning of current fiscal year	89,573,343

¹ Only if future expenses are accrued in PBO through a load on service cost.

2.3 Summary of net balances

Refer to Appendix C for balances by plan.

2.4 Development of market-related value of assets

All monetary amounts shown in US Dollars

Fiscal Year Ending		12/31/2022
A Development of Market-Related Value of Assets		
1	Fair value of assets at current fiscal year end	89,573,343
2	Deferred investment gains/(losses) for prior periods	
	Fiscal Year Gain/(Loss)	
a	12/31/2022	(32,595,894)
b	12/31/2021	(2,072,014)
c	12/31/2020	11,951,941
d	12/31/2019	13,475,413
e	12/31/2018	(10,843,853)
	Percent Deferred	
a	12/31/2022	80%
b	12/31/2021	60%
c	12/31/2020	40%
d	12/31/2019	20%
e	12/31/2018	0%
	Deferred Amount	
a	12/31/2022	(26,076,715)
b	12/31/2021	(1,243,208)
c	12/31/2020	4,280,776
d	12/31/2019	2,695,083
e	12/31/2018	0
3	Market-related value of assets	109,417,407

2.5 Summary and comparison of benefit cost and cash flows

All monetary amounts shown in US Dollars

Fiscal Year Ending	12/31/2023	12/31/2022
A Total Benefit Cost		
1 Employer service cost	524,929	919,693
2 Interest cost	4,216,810	3,014,355
3 Expected return on plan assets	(5,815,852)	(5,014,396)
4 Subtotal	(1,074,113)	(1,080,348)
5 Net prior service cost/(credit) amortization	0	0
6 Net loss/(gain) amortization	565,434	1,453,686
7 Subtotal	565,434	1,453,686
8 Net periodic benefit cost/(income)	(508,679)	373,338
9 Curtailment (gain)/loss	0	0
10 Settlement (gain)/loss	0	0
11 Special/contractual termination benefits	0	0
12 Other adjustments	0	0
13 Total benefit cost	(508,679)	373,338
B Assumptions (See Appendix A for interim measurements, if any)		
1 Discount rate	5.40%	2.85%
2 Expected long-term rate of return on plan assets	5.50%	4.50%
3 Rate of compensation increase (non-administrative)	4.00%	4.00%
4 Census date	01/02/2023	01/01/2022
C Plan Assets at Beginning of Year		
1 Fair value	89,573,343	123,448,920
2 Market-related value	109,417,407	114,713,972
D Cash Flows		
	Expected	Actual
1 Employer contributions	0	0
2 Plan participants' contributions	0	0
3 Benefits paid from Company assets	55,061	42,426
4 Benefits paid from plan assets	7,448,996	6,294,079
E Amortization Period		
	N/A	N/A

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Appendix A : Statement of consolidated actuarial assumptions, methods and data sources

Plan Sponsor

Upper Peninsula Power Company for all plans.

Statement of Assumptions

The assumptions disclosed in this Appendix are for the fiscal year ending December 31, 2023 financial reporting.

Assumptions and methods for pension cost purposes

Economic Assumptions

Discount rate:

- | | |
|---|-------|
| • Upper Peninsula Power Company Retirement Plan | 5.40% |
| • Pension Restoration Plan | 5.30% |
| • SERP | 5.25% |

Expected return on assets

- | | |
|---------------|-------|
| • Fiscal 2023 | 5.50% |
|---------------|-------|

Lump sum conversion rate

- | | |
|---|-------|
| • Upper Peninsula Power Company Retirement Plan | 5.40% |
|---|-------|

Annual rates of increase

- | | |
|-------------------------------------|-------|
| • Compensation: | |
| – Administrative employees | N/A |
| – Non-Administrative employees | 4.00% |
| • Future Social Security wage bases | 3.50% |
| • Statutory limits on compensation | 2.50% |
| • Interest crediting rate | 4.00% |

The expected return on assets shown above is net of expenses assumed to be paid from the trust.

Demographic and Other Assumptions

Inclusion date	The valuation date coincident with or next following the date on which the employee becomes a participant.
New or rehired employees	It was assumed there will be no new or rehired employees.
Benefit commencement dates	
<ul style="list-style-type: none"> • Preretirement death benefit <ul style="list-style-type: none"> – Administrative Upon death of the active participant – Non-Administrative Upon the later of the death of the active participant or the date the participant would have attained earliest retirement age. • Deferred vested benefit <ul style="list-style-type: none"> – Administrative Upon termination of employment – Non-Administrative Upon the later of attainment of normal retirement age or termination of employment. • Disability benefit Upon disablement • Retirement benefit Upon termination of employment 	
Form of payment	
<ul style="list-style-type: none"> • Administrative 100% of participants are assumed to elect an immediate lump sum. • Non-Administrative 100% of single participants are assumed to elect a lifetime monthly annuity. 100% of married participants assumed to elect a 50% Joint and Survivor annuity. 	
Mortality for annuity conversion basis for PEP account balances and lump sums	417(e)(3) applicable mortality table in effect at 1/1/2023
Percent married	80% of males; 50% of females
Spouse age	Wife three years younger than husband

Cash flow

- Decrement timing
 The assumptions used are collectively called rounded middle of year (rounded MOY) decrement timing. Most events are assumed to occur at the middle of year during which the eligibility condition will be met or the start/end date will occur. For death and disability decrements, the rate applied is based on the participant's rounded age (nearest integer age) at the beginning of the year, to align with the methodology generally used to create those rate tables. For retirement and withdrawal decrements, the age is generally the participant's rounded age at the middle of the year.
- Timing of benefit payments
 Annuity payments are payable monthly at the beginning of the month and lump sum payments are payable on date of decrement.

Administrative expenses

Return on asset assumption is net of any expense paid by the trust. It is assumed that administrative expenses will reduce the rate of return on assets by 0.45% per annum.

Funding policy

- Retirement Plan: The funding policy of the Plan is to meet all minimum required contributions and maintain a funded status of 80%.
- Non-qualified Plans: These are unfunded plans, and a funding policy is not applicable.

Demographic Assumptions

Mortality – Healthy & Disabled

- Base table: Pri-2012 retiree and contingent annuitant tables with separate tables for males and females.
- Base mortality table year: 2012
- Table Type: No collar
- Healthy or Disabled: Healthy (Disabled for disability mortality)
- Table weighting: Benefit
- Separate rates for annuitants and non-annuitants (based on employee tables)
- Mortality improvement scale: MP-2020

Disability

Rates Varying by Age and Gender
Representative Disability Rates

Percentage assumed to become disabled during the year		
Attained Age	Males	Females
20	0.03%	0.04%
25	0.03%	0.05%
30	0.04%	0.06%
35	0.05%	0.08%
40	0.07%	0.10%
45	0.10%	0.15%
50	0.18%	0.26%
55	0.36%	0.49%
60	0.90%	1.21%
65	0.00%	0.00%

Termination

Rates Varying by Age and Gender
Representative Termination Rates

Percentage assumed to leave during the year		
Attained Age	Males	Females
25	5.0%	10.0%
30	4.7%	9.4%
35	3.3%	6.7%
40	1.4%	2.7%
45	0.6%	1.2%
50	0.2%	0.5%
55	0.0%	0.0%
60	0.0%	0.0%

Retirement

Rates Varying by Age and Plan Representative Retirement Rates

Percentage assumed to retire during the year		
Age	Administrative	Non-Administrative
55	5%	5%
56	5%	5%
57	5%	5%
58	15%	20%
59	10%	15%
60	20%	30%
61	20%	40%
62	60%	80%
63	30%	50%
64	50%	50%
65	100%	100%

Methods (for all plans)

Census date

- January 1, 2023 for Upper Peninsula Power Company Retirement Plan
- December 31, 2022 for Pension Restoration Plan and SERP

Measurement date

Fiscal year-end

Service cost and projected benefit obligation

The Projected Unit Credit Cost Method is used to determine the Projected Benefit Obligation (PBO) and the related service cost. Under this method, a "projected accrued benefit" is calculated based upon service as of the measurement date and projected future compensation and social security levels at the age at which the employee is assumed to leave active service. The PBO is the present value of this benefit and the service cost is the present value of the increase in the benefit due to service in the upcoming year. In normal circumstances the "projected accrued benefit" is based upon the plan's accrual formula. However, if service in later years leads to a materially higher level of benefit than in earlier years, the "projected accrued benefit" is calculated by attributing benefits on a straight-line basis over the relevant period.

The benefits described above are used to determine both ABO and PBO (except that final average pay, Social Security offsets, and covered compensation are assumed to remain constant in the future when calculating ABO).

Market value of assets

The fair value of assets on the measurement date, less the unrecognized portion of assets gains and losses on fair value of assets. The following percentages are considered for this purpose

- 80% of the first preceding 12 months
- 60% of the second preceding 12 months
- 40% of the third preceding 12 months
- 20% of the fourth preceding 12 months

Amortization of unamortized amounts:

- Transition obligation (asset) Not applicable
- Past service cost (credit) Amortization of net prior service cost/(credit) resulting from a plan change is included as a component of Net Periodic Benefit Cost/(Income) in the year first recognized and every year thereafter until such time as it is fully amortized. The annual amortization payment is determined in the first year as the increase in PBO due to the plan change divided by the average remaining service period of participating employees expected to receive benefits under the plan.

However, when the plan change reduces the PBO, existing positive prior service costs are reduced or eliminated on a pro-rata basis before a new prior service credit is established.
- Net loss (gain) Amortization of the net gain or loss resulting from experience different from the assumed and from changes in assumptions (excluding asset gains and losses not yet reflected in market-related value) is included as a component of Net Periodic Benefit Cost/(Income) for a year.

If, as of the beginning of the year, that net gain or loss exceeds 10% or greater of the PBO and the market-related value of assets, the amortization is that excess divided by 25 years for the qualified plan and average remaining life expectancy for the non-qualified plans.

The plan sponsor considers participants whose benefits are soft frozen to be active participants.

Under this methodology, the gain/loss amount recognized in AOCI are not expected to be fully recognized in benefit cost until the plan is terminated (or an earlier event, like a settlement triggers recognition) because the period over which the amounts are amortized is redetermined each year and amounts that fall within the corridor described above are not amortized.

Benefits not valued

All benefits described in the Plan Provisions were valued as described. Willis Towers Watson is not aware of any significant benefits required to be valued that were not.

Source of Prescribed Methods

Accounting methods

The methods used for accounting purposes described in Appendix A, including the method of determining the market-related value of plan assets are “prescribed methods set by another party,” as defined in the actuarial standards of practice (ASOPs). As required by U.S. GAAP, these methods were selected by the plan sponsor.

Assumptions Rationale - Significant Economic Assumptions

Discount rate

As required by U.S. GAAP the discount rate was chosen by the plan sponsor based on market information on the measurement date. The rate derived from market information is rounded to 5 basis points. Based on Willis Towers Watson’s interest rate model, RATE:Link, that uses a yield curve derived from current, high quality (rated AA and above) corporate bonds to discount expected pension cash flows, and thus determine discount rates, we believe the discount rate chosen does not significantly conflict with what would be reasonable.

Expected return on plan assets

We understand that the expected return on assets assumption reflects the plan sponsor’s estimate of future experience for trust asset returns, reflecting the plan’s current asset allocation and any expected changes during the current plan year, current market conditions and the plan sponsor’s expectations for future market conditions. The analysis was informed by analysis of historical data and recent trends for CPI, GDP growth, and real returns on the various classes of assets held by the trust. Willis Towers Watson’s determination that this assumption does not significantly conflict with what would be reasonable is informed by Willis Towers Watson’s Expected Return Estimator model.

Interest crediting rate

The plan will credit interest to the frozen pension equity plan accounts using the first segment rate defined under the Pension Protection Act for use in determining minimum lump distribution under IRC 417(e)(3). The plan sponsor has selected a single rate. After examining historical variability in this rate, we believe that the selected assumption does 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.

Annuity conversion rate

The annuity conversion rate is based on the current market rates. After examining historical variability in this rate, we believe that the selected assumption does 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.

Lump sum conversion rate

Lump sum benefits are valued based on the current market rates. After examining historical variability in this rate, we believe that the selected assumption does 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.

Rates of increase in compensation

Assumed increases were chosen by the plan sponsor and, as required by U.S. GAAP they represent an estimate of future experience. We relied on the plan sponsor for this assumption, as the plan sponsor has access to pertinent information related to their business and is in a better position to set this assumption. However, we believe that the assumption chosen does not significantly conflict with what would be reasonable based on the assumed future CPI and GDP growth inherent in the other economic assumptions chosen, other than the discount rate.

Administrative expenses

Administrative expenses are estimated by determining the actual expenses paid from the trust the preceding year and are already incorporated into the expected rate on assets assumption. We believe that this approach to setting assumed future expenses does not significantly conflict with what would be reasonable because it considers both historical and expected future changes in the level of expenses.

Assumptions Rationale - Significant Demographic Assumptions

Healthy Mortality

Assumptions used for accounting purposes were selected by the plan sponsor and, as required by U.S. GAAP, represent a best estimate of future experience. We believe the assumptions do not significantly conflict with what would be reasonable because they reflect recent experience and are adjusted to reflect the plan sponsor's expectations regarding future mortality improvement.

Disabled Mortality	Assumptions used for accounting purposes were selected by the plan sponsor and, as required by U.S. GAAP, represent a best estimate of future experience. For the reasons described above, we believe the assumptions do not significantly conflict with what would be reasonable.
Termination	Termination rates were set several years ago based on historical experience and no significant gains or losses have been observed due to actual termination experience different than expected. For the reasons discussed above, we believe the assumptions selected do not significantly conflict with what would be reasonable.
Disability	Disability rates are based on a standard UAW table. Actual experience is not material to set plan-specific rates. For the reasons discussed above, we believe the assumptions selected do not significantly conflict with what would be reasonable.
Retirement	Retirement rates were set several years ago based on historical experience and no significant gains or losses have been observed due to actual retirement experience different than expected. For the reasons discussed above, we believe the assumptions selected do not significantly conflict with what would be reasonable.
Benefit commencement date for deferred benefits:	
<ul style="list-style-type: none">• Deferred vested benefit	<p>Deferred vested participants are assumed to begin benefits at age 65 (or current age if later) because the plan's experience is not considered to be credible.</p> <p>For the reasons discussed above, we believe the assumption does not significantly conflict with what would be reasonable.</p>
Form of payment	<p>Retiring Administrative participants are assumed to take a lump sum due to the design of the plan.</p> <p>Retiring Non-Administrative participants are assumed to take a 50% joint and survivor annuity if married and a single life annuity if single. These are the normal forms under the plan.</p> <p>For the reasons discussed above, we believe the assumption does not significantly conflict with what would be reasonable.</p>

Marital Assumptions:

- Percent married The assumed percentage married is based on general population statistics on the marital status of individuals of retirement age.
- Spouse age The assumed age difference for spouses is based on general population statistics of the age difference for married individuals of retirement age.

For the reasons discussed above, we believe the assumption does not significantly conflict with what would be reasonable.

Sources of Data and Other Information

The plan sponsor furnished participant data as of 1/1/2023 for the Upper Peninsula Power Company Pension Plan and as of 12/31/2022 for the Pension Restoration Plan and the SERP. Information on assets, contributions and plan provisions was supplied by the plan sponsor. Data and other information were reviewed for reasonableness and consistency, but no audit was performed. Based on discussions with the plan sponsor, assumptions or estimates were made when data were not available, and the data was adjusted to reflect any significant events that occurred between the date the data was collected and the measurement date. In consultations with the Company, the following assumptions were made for missing or apparently inconsistent data elements: for missing beneficiary dates of birth, females were assumed to be 3 years younger than males; for missing beneficiary sexes, male participants were assumed to have a female beneficiary and female participants were assumed to have a male beneficiary; for deferred participants, the benefit commencement date was assumed to be the date the participant reaches age 65.

Accumulated other comprehensive (income)/loss amounts shown in the report are shown prior to adjustment for deferred taxes. Any deferred tax effects in AOCI should be determined in consultation with the Company's tax advisors and auditors. WTW used information supplied by the Company regarding the amounts recognized in accumulated other comprehensive income as of the end of the 2022 fiscal year and amounts recognized in other comprehensive income in the 2022 fiscal year.

We are not aware of any errors or omissions in the data that would have a significant effect on the results of our calculations.

Changes in Assumptions, Methods and Estimation Techniques

Changes in Assumptions

The discount rate was changed for each plan as of December 31, 2022 to reflect current market conditions:

- UPPCO Retirement Plan from 2.85% to 5.40%
- UPPCO Restoration Plan from 2.50% to 5.30%
- UPPCO SERP from 2.40% to 5.25%

For the UPPCO Retirement Plan, the interest credit rate was updated from 3.05% to 4.00% to reflect current market conditions.

For the UPPCO Retirement Plan, the expected return on assets assumption was updated from 4.50% for fiscal 2022 to 5.50% for fiscal 2023.

Changes in Methods

None

Changes in Estimation Techniques

None

Model Descriptions and Disclosures in accordance with ASOP No. 56

Quantify

Quantify is the Willis Towers Watson centrally developed, tested and maintained Global actuarial valuation system. It is used to perform valuations of clients' benefit plans.

Quantify provides the ability to process data, calculate benefits and value benefit liabilities, develop results using applicable standards, and generate client reports.

Quantify parameters provide significant flexibility to model populations and plan designs. Various demographic, economic and benefit related assumptions exist for users to model multiple demographic and economic situations.

Plan liabilities are calculated based on standard actuarial techniques, developing actuarially reasonable results using the population and parameters entered. The calculation and presentation of liabilities in Quantify relies on the assumptions used and the reasonability of the assumptions selected.

Quantify incorporates standard liability methodologies that are intended to reasonably reflect a variety of economic or demographic conditions. The model itself does not evaluate any assumptions entered for reasonableness, consistency or probability of occurrence.

Quantify is designed specifically for these purposes, and we know of no material limitations that would prevent the system from being suitable for these intended purposes. The actuaries signing this report have relied on the actuaries who develop, test and maintain this system, and have also performed a limited review of results to ensure that system parameters have been set appropriately and plan provisions coded correctly.

Quantify FR

Quantify Financial Reporting (FR) is intended to calculate funding results, accounting results and produce the associated client reports under selected accounting standards. The calculations and reports are based on various user specified inputs including liability results and asset values.

Quantify FR develops valuation results for various accounting and funding purposes using standard actuarial techniques.

Calculation of disclosure liabilities and results may be based on roll forward liabilities.

Liability roll-forwards are used in accounting scenarios where the date as of which liabilities are valued does not coincide with the fiscal year measurement date. The roll-forwards consist of adjusting liabilities for the passage of time.

The estimate of the following year's expense is calculated based on the obligations and assets used for disclosure and incorporates service cost that may be based on a projection in the associated Quantify liability run, depending on the relationship of the liability valuation date to the fiscal year.

The Roll Forward accounting calculations assume that applicable rules will not change during the roll-forward period. Actuaries make adjustments to the data, plan provisions and assumptions reflected in the calculation of the liabilities that are rolled forward so that the results reflect conditions at the measurement date, and/or make similar adjustments to the results of the roll forward, including reflecting any changes in applicable accounting standards.

RATE:Link/RateCalc

RATE:Link is a methodology to develop spot rates to be used for liability and cost measurements related to employee benefit plans. The same core methodology is used to develop all RATE:Link curves. The RATE:Link process develops term structures of interest rates from corporate bond data for each covered geography (e.g., the U.S.) for this valuation).

The construction of RATE:Link yield curves relies on bond data collected as of the measurement date.

Information regarding quoted bond prices, yields and other bond related data is from Bloomberg Finance L.P.

RateCalc is used as one component in developing the single equivalent discount rate that reflects the characteristics of the client's employee benefit plan. It references a yield curve (often a RATE:Link curve) and expected plan benefit payments. The projected benefit payments from the client's plan are matched to the spot rates along the yield curve to determine their present values. A single equivalent discount rate is then solved for, which produces the same total present value as the spot rates.

Expected Return Estimator

The Expected Return Estimator is used to help inform the choice of an expected return assumption (e.g., as one data point to consider) for returns on the assets of the trust.

The tool depends on the capital market assumptions chosen at the starting date of the simulation. These assumptions reflect currently prevailing capital market conditions, assumed future conditions ("normative conditions"), and the transition from the current conditions to the normative ones.

The assumed normative conditions incorporate a blend of historical capital market data and future expectations. The sources consulted in the determination of normative levels include practitioners in our global actuarial and investment consulting practices, plan sponsors, investment managers, economists, and academics.

Published Demographic Tables

Certain demographic tables described above are standard published tables or are based on standard published tables from models developed by organizations with the requisite expertise

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Appendix B : Summary of principal plan provisions

Plan Provisions – Upper Peninsula Power Company Retirement Plan

Upper Peninsula Power Company Retirement Plan is closed to new entrants, effective as follows:

- Administrative employees effective January 1, 2008
- Non-Administrative employees effective April 19, 2009

Retirement Program for Administrative Employees

Employees included

Except for anyone who is subject to a collective bargaining agreement, an employee became a participant on January 1 or July 1 coincident with or next following the date of completion of one year of eligibility service subject to the provisions concerning closure of the plan to new entrants.

Definitions

Service considered

Year of “Eligibility Service” is the twelve month period commencing on the date of hire or rehire, or any plan year in which the employee completes 1,000 or more hours of service.

“Service credit,” to determine eligibility for and the amount of benefits, is determined under the ERISA elapsed-time rules. Service credit will be earned while the employee is receiving benefits from the long-term disability plan sponsored by the company. No additional benefit service will accrue after December 31, 2012.

Compensation considered

Total compensation prior to severance from service excluding nonqualified deferred compensation payments, and extraordinary payments. Annual compensation is limited to \$200,000, adjusted in accordance with Internal Revenue Code. Final average pay is the higher of the average of (a) the highest five complete calendar years of pay within the last 10 calendar years preceding severance from service, or (b) total pay for 60 months preceding severance from service. Pay after December 31, 2017 will not be considered in the calculation of final average pay.

Eligibility for Benefits

Benefit eligibility

5 years of service (3 years for employees who terminate employment on or after January 1, 2008).

Benefits Payable

Plan Benefit

(a) Benefit payable to a plan participant with 3 years of vesting service.

(b) Total Service Percent is a total of:

9% per year for the first 10 years of service;

plus 12% per year for years 11 through 20;

plus 15% per year for years 21 and thereafter.

For employees hired after December 31, 2000, the service percentages are 9%, 11% and 13%, respectively.

(c) Pension Income (lump-sum form) is equal to Total Service Percent times Final Average Pay.

(d) Minimum benefit is the lump-sum value of the benefit earned through December 31, 2000 under the plan provisions in effect at December 31, 2000.

There will be no additional service or pay increases applied to the plan benefit after December 31, 2012 and December 31, 2017, respectively. Effective January 1, 2018 the frozen accrued benefit will be increased each year until benefit commencement with annual interest credits based on the greater of (a) first segment rate defined under the Pension Protection Act for use in determining minimum lump-sum distributions under IRC 417(e), and (b) the plan's minimum interest crediting rate of 3.05%.

Pension transition

For employees employed on January 1, 2001:

(a) Calculated by taking combination of participant's age and service on January 1, 2001.

(b) Total age plus service is multiplied by 1.35% to arrive at Transition Percent (limited to 115%).

This percent is held constant until retirement or participant leaves the company and will be multiplied by Final Average Pay to determine the Pension Transition amount (payable as a lump sum). The minimum amount is \$50,000 for employees who were at least age 58 and had five years of service at December 31, 2000.

Pension supplement

To be eligible for the Pension Supplement, participant must be

- (a) employed on January 1, 2001;
- (b) retire after January 1, 2001;
- (c) be at least 55 years of age, and
- (d) have 5 years of service with the company.

The Pension Supplement is payable as a fixed \$800 monthly payment from retirement until age 65, or as a lump sum based on age at retirement and current interest rates.

For employees hired after January 1, 2001, eligibility for the supplement requires the participant to be age 55 with 10 years of service. The Pension Supplement amount is earned at a rate of \$40 per year of service (earned prior to January 1, 2013).

Surviving spouse's benefit

- (a) If the death of a vested participant occurs, the spouse will receive either a single-sum payment or a survivor annuity benefit. If the participant had designated a non-spouse beneficiary and the surviving spouse had consented, the beneficiary will receive a single-sum payment.
- (b) If a participant who was receiving a monthly pension dies, the surviving spouse will receive payment in accordance with the joint and survivor option elected or the remainder of the Pension Equity Account Balance, if any.

Other Plan Provisions

Forms of payment

Preretirement death benefits are payable only as described above. Monthly pension benefits are paid as described above as a life annuity, if the participant has no spouse as of the date payments begin, or if the participant so elects. Otherwise, benefits are paid in the form of a 50% joint and survivor annuity option or, if the participant elects and the spouse consents, another actuarially equivalent optional form offered by the plan. Optional forms and actuarial equivalence are as follows:

Normal form of payment

Married participants receive a fully subsidized 50% joint & survivor annuity. The normal form of payment for unmarried participants is a single life annuity.

**Optional forms of payment
and conversion factors**

Form of Payment	Conversion Factor
Lump Sum	Accrued PEP Balance at time of termination or retirement.
Annuity	PEP balance is converted to an annuity using the Applicable Mortality Table and Applicable Interest Rate.
Life Annuity	Calculated using annuity conversion factor with no further adjustment.
50% Joint and Survivor Annuity	Calculated using annuity conversion factor with no further adjustment unless spouse is more than 5 years younger than participant, in which case additional reductions apply.
75% Joint and Survivor Annuity	Calculated as 96% of life annuity benefit unless spouse is more than 5 years younger than participant, in which case additional reductions apply.
100% Joint and Survivor Annuity	Calculated as 93% of life annuity benefit unless spouse is more than 5 years younger than participant, in which case additional reductions apply.
Unreduced lifetime benefit	Participants whose spouse is greater than 5 years younger can elect to receive the equivalent of the life annuity benefit during their lifetime, with their spouse receiving an actuarially equivalent 50% survivor benefit, calculated using 6% interest and the 1971 Group Annuity Mortality Table.

Additionally, participants who are administrative employees who have joined the plan through a merged prior plan may be entitled to actuarially equivalent benefits in the following forms: single life annuity, 5, 10, or 15-year certain annuity, 25% joint and survivor annuity with or without popup, 50% joint and survivor annuity with or without popup, 66 2/3% joint and survivor annuity with or without popup, 100% joint and survivor annuity with or without popup.

Pension Increases None

Plan participants' contributions None

Maximum on benefits and pay All benefits and pay for any calendar year may not exceed the maximum limitations for that year as defined in the Internal Revenue Code. The plan provides for increasing the dollar limits automatically as such changes become effective. Increases in the dollar limits are not assumed for determining the AFTAP.

Benefits not valued All benefits described in the Plan Provisions were valued as described. Willis Towers Watson is not aware of any significant benefits to be valued that were not.

Future Plan Changes

None.

Changes in Benefits Valued Since Prior Year

None.

Retirement Program for Non-Administrative Employees

Employees Included An employee represented by Local Union No. 510 of the IBEW became a participant upon completion of one year of service credit subject to the provisions concerning closure of the plan to new entrants.

Definitions

Service considered A year of service is granted for each July 1st through June 30th in which 1,000 hours are worked. In any computation period in which a participant begins, resumes, or terminates employment, 1/12th of a year of credit is given for each complete month worked.

Compensation considered Fixed Monthly Earnings on July 1 of each year.

Eligibility for Benefits

Normal retirement benefit On or after attainment of age 65 or, for an individual who became a participating employee after age 60, on the 4th anniversary of his date of participation.

Early retirement benefit Available upon reaching age 55 with 10 years of service (prior to 1/1/1993: age 45 and 10 years of service).

Deferred vested benefit In the event of termination of employment prior to age 55 and after 10 or more years of service credit. Certain participants are granted a grandfather eligibility of age 45 and 10 years of service.

Surviving spouse benefit In the event of death of an active participant occurring after attainment 5 years of service credit.

In the event of a death of a participant who was receiving a pension under the foregoing paragraphs.

In the event of death of a deferred vested participant who has not commenced the benefit and who has been married for one year as of the date of death dies prior to pension commencement date.

Benefits Payable

Normal retirement benefit The sum of (1) 2% of Monthly Earnings as of 7/1/1980 times years of service prior to 7/1/1980 plus (2) 2% of July 1 fixed Monthly Earnings for each year after 7/1/1980 and prior to 7/1/1999 plus (3) 2.25% of July 1 fixed Monthly Earnings for each year beginning 7/1/1999.

Early retirement benefit

Monthly pension commencing as of the date designated by the participant or as of the participant's severance from service date, as the case may be, is determined in the same manner as a normal retirement benefit under the Normal Retirement Benefit paragraph above, reduced by 3% per year. Unreduced benefit becomes available upon reaching Rule of 85 for participants as of May 1, 1991.

Deferred vested benefit

Monthly pension payable as of the later of age 55 or the date designated by the employee, but not later than age 65, is determined in the same manner as an early retirement benefit under the Early Retirement Benefit paragraph

Surviving spouse benefit

The spouse to whom the participant was married to as of the date of his death will receive 50% of the pension determined under the following stipulations. This benefit will be reduced if the spouse is younger than the participant.

If the death occurs after early retirement age, the base benefit is determined under the above Normal Retirement Benefit provisions, as if his date of death was his normal retirement date, based on his service credit and average monthly compensation as of his death. Payable at the later of the date of death or the date the participant would have reached age 55.

If the death occurs prior early retirement age, but after 5 years of service credit and before 10 years of service credit, the base benefit is determined based upon the foregoing paragraph of Normal Retirement Benefit payable at the date the deceased member would have turned age 65.

If the death occurs prior early retirement age, but after 10 years of service credit, the base benefit is determined as the total accrued monthly benefit, without reduction for early commencement. The benefit is payable on the first day of the month following the date of death.

If the death of a participant who was receiving a pension under the foregoing paragraphs, the base benefit is determined as the pension the participant was receiving immediately prior to his death.

If the death of a vested participant occurs prior to his pension commencement date, the base benefit is determined under the foregoing Early Retirement Benefit paragraph based on his service credit. Payable at the date of the participant's death.

Other Plan Provisions

Lump sum payments Small lump sums will be paid if the value of benefit is \$1,000 or less (\$5,000 prior to March 28, 2005). Lump sums are determined based on interest rates prescribed by the Secretary of the Treasury pursuant to Section 417(e)(3) of the Code.

Normal form of payment Married participants receive a fully subsidized 50% joint & survivor annuity. The normal form of payment for unmarried participants is a single life annuity.

Optional forms of payment and conversion factors Plan participants from the prior Upper Peninsula Power Company Plan are also eligible for the following forms of payment using the option factors shown:

Joint and Survivor Pension Option Factors				
Age of Participant at Retirement	Option			
	<u>100%</u>	<u>75%</u>	<u>66-2/3%</u>	<u>50%</u>
45-49	.93	.95	.95	.96
50-54	.91	.93	.94	.95
55-59	.89	.92	.92	.94
60-64	.86	.89	.90	.92
65 and above	.83	.87	.88	.91

Additional age adjustments apply for participants whose spouse has an age difference of greater than three years, subject to maximum adjustments as outlined in the plan document.

Additionally, Non-Administrative employees who are participants and joined the plan through a merged prior plan may be entitled to actuarially equivalent benefits in the following forms: single life annuity, 5, 10, or 15-year certain annuity, joint and survivor annuity with or without popup.

Pension Increases None

Plan participants' contributions None

Maximum on benefits and pay

All benefits and pay for any calendar year may not exceed the maximum limitations for that year as defined in the Internal Revenue Code. The plan provides for increasing the dollar limits automatically as such changes become effective. Increases in the dollar limits are not assumed for determining the AFTAP.

Benefits not valued

All benefits described in the Plan Provisions were valued as described. Willis Towers Watson is not aware of any significant benefits to be valued that were not.

Future Plan Changes

None.

Changes in Benefits Valued Since Prior Year

None.

Upper Peninsula Power Company Pension Restoration Plan

Effective date	The plan was most recently amended and restated effective in 2014.
Employees included	UPPCO employees who were participating in the Integrys Energy Group Pension Restoration Plan immediately prior to August 28, 2014. The plan is intended to be a deferred compensation plan maintained for a select group of management or highly compensated employees.
Plan compensation	Total compensation prior to severance from service, including nonqualified deferred compensation payments, and extraordinary payments. Final average pay is the higher of the average of (a) the five complete calendar years of service within the last 10 calendar years preceding severance from service, or (b) 60 months preceding severance from service. Compensation includes annual bonus amounts deferred by the employee under a Deferred Compensation Plan. Pay after December 31, 2017 will be not be considered in the calculation of final average pay.
Benefit amount	The benefit amount payable under this plan is based on the Administrative employees' formula as provided in the qualified retirement plan (Part A), and is the difference between the amount calculated using plan compensation outlined above, without restriction for IRC sections 401(a)(17) and 415, and the amount determined using plan compensation as defined under the qualified plan.
Surviving spouse benefit	Upon the death of an active participant, the beneficiary will receive a lump sum equal to the lump sum that the employee would have received had he terminated.
Form of payment	Lump sum will be paid unless the employee elects otherwise.

Future Plan Changes

None.

Changes in Benefits Valued Since Prior Year

None.

Upper Peninsula Power Company SERP

Service	Period of employment with the Company. Full year given in any plan year with 1,000 hours.
Retirement benefit	One-half percent of Final Annual Salary times Service. Service uses 25 years minimum and 40 years maximum.
Pre-retirement death benefit	A surviving spouse of a participant who dies prior to his or her Retirement Date and while still employed shall be entitled to an annual benefit based upon the participant's Retirement Benefit calculated on the date of death.
Normal form	15 year certain benefit.

Future Plan Changes

None.

Changes in Benefits Valued Since Prior Year

None.

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Appendix C : Accounting exhibits by plan

C.1 Summary of key results for period beginning January 1, 2023

All monetary amounts shown in US Dollars

		Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
Benefit Cost/(Income)	Net Periodic Benefit Cost/(Income)	(508,679)	(535,621)	15,071	11,871
	Benefit Cost/(Income) due to Special Events	0	0	0	0
	Total Benefit Cost/(Income)	(508,679)	(535,621)	15,071	11,871
Plan Assets	Fair Value of Plan Assets (FVA)	89,573,343	89,573,343	0	0
	Market Related Value of Plan Assets (MRVA)	109,417,407	109,417,407	0	0
	Return on Fair Value of Plan Assets during Prior Year	(22.93%)	(22.93%)	0.00%	0.00%
Benefit Obligations	Accumulated Benefit Obligation (ABO)	(79,632,295)	(79,227,161)	(305,157)	(99,977)
	Projected Benefit Obligation (PBO)	(81,274,728)	(80,869,594)	(305,157)	(99,977)
Funded Ratios	Fair Value of Plan Assets to ABO	112.5%	113.1%	0.0%	0.0%
	Fair Value of Plan Assets to PBO	110.2%	110.8%	0.0%	0.0%
Accumulated Other Comprehensive (Income)/Loss (Pre-tax)	Net Prior Service Cost/(Credit)	0	0	0	0
	Net Loss/(Gain)	44,857,312	44,747,720	25,147	84,445
	Total Accumulated Other Comprehensive (Income)/Loss	44,857,312	44,747,720	25,147	84,445
Assumptions	Discount Rate	5.40%	5.40%	5.30%	5.25%
	Expected Long-Term Rate of Return on Plan Assets	5.50%	5.50%	N/A	N/A
	Rate of Compensation Increase (non-administrative)	4.00%	4.00%	N/A	N/A
Participant Data	Census Date	N/A	01/01/2023	01/01/2023	01/01/2023

C.2 Participant information

All monetary amounts shown in US Dollars

		Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
Census Date		N/A	01/01/2023	01/01/2023	01/01/2023
Participating Employees	Number	58	58	0	0
	Average Annual Compensation for Non-Administrative Employees	92,429	92,429	0	0
	Average PEP Lump Sum Benefit for Administrative Employees	237,000	237,000	0	0
	Average Age	49.59	49.59	0.00	0.00
	Average Credited Service	20.49	20.49	0.00	0.00
Participants with Deferred Benefits	Number	41	41	0	0
	Average Age	55.49	55.49	0.00	0.00
	Participants with deferred annuity benefits – number	38	38	0	0
	Participants with deferred annuity benefits – average annual benefits	7,139	7,139	0	0
	Participants with deferred PEP lump sum benefits – number	3	3	0	0
	Participants with deferred PEP lump sum benefits – average benefits	195,885	195,885	0	0
Participants Receiving Benefits	Number	499	494	3	2
	Average Annual Benefit Payments	12,508	12,549	9,761	6,572
	Average Age	74.16	74.14	74.67	78.50

C.3 Balance sheet asset/(liability) at January 1, 2023

All monetary amounts shown in US Dollars

	Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
A Development of Balance Sheet Asset/(Liability)				
1 Projected benefit obligation (PBO)	(81,274,728)	(80,869,594)	(305,157)	(99,977)
2 Fair value of plan assets (FVA)	89,573,343	89,573,343	0	0
3 Net balance sheet asset/(liability)	8,298,615	8,703,749	(305,157)	(99,977)
B Current and Noncurrent Classification				
1 Noncurrent asset	8,703,749	8,703,749	0	0
2 Current liability	(53,660)	0	(41,081)	(12,579)
3 Noncurrent liability	(351,474)	0	(264,076)	(87,398)
4 Net balance sheet asset/(liability)	8,298,615	8,703,749	(305,157)	(99,977)
C Accumulated Benefit Obligation (ABO)	(79,632,295)	(79,227,161)	(305,157)	(99,977)
D Accumulated Other Comprehensive (Income)/Loss				
1 Net prior service cost/(credit)	0	0	0	0
2 Net loss/(gain)	44,857,312	44,747,720	25,147	84,445
3 Accumulated other comprehensive (income)/loss	44,857,312	44,747,720	25,147	84,445
E Assumptions and Dates				
1 Discount rate	5.40%	5.40%	5.30%	5.25%
2 Rate of compensation increase (non-administrative)	4.00%	4.00%	N/A	N/A
3 Census date	N/A	01/01/2023	01/01/2023	01/01/2023

C.4 Changes in liabilities and assets for period beginning January 1, 2023

All monetary amounts shown in US Dollars

	Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
A Change in Projected Benefit Obligation (PBO)				
1 PBO at beginning of prior fiscal year	108,229,582	107,720,274	385,032	124,276
2 Employer service cost	919,693	919,693	0	0
3 Interest cost	3,014,355	3,002,298	9,229	2,828
4 Actuarial loss/(gain)	(24,552,397)	(24,478,592)	(59,821)	(13,984)
5 Plan participants' contributions	0	0	0	0
6 Benefits paid from plan assets	(6,294,079)	(6,294,079)	0	0
7 Benefits paid from Company assets	(42,426)	0	(29,283)	(13,143)
8 Administrative expenses paid	0	0	0	0
9 Plan amendments	0	0	0	0
10 Acquisitions/(divestitures)	0	0	0	0
11 Curtailments	0	0	0	0
12 Settlements	0	0	0	0
13 Special/contractual termination benefits	0	0	0	0
14 Other adjustments	0	0	0	0
15 PBO at beginning of current fiscal year	81,274,728	80,869,594	305,157	99,977

	Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
B Change in Plan Assets				
1 Fair value of plan assets at beginning of prior fiscal year	123,448,920	123,448,920	0	0
2 Actual return on plan assets	(27,581,498)	(27,581,498)	0	0
3 Employer contributions	42,426	0	29,283	13,143
4 Plan participants' contributions	0	0	0	0
5 Benefits paid	(6,336,505)	(6,294,079)	(29,283)	(13,143)
6 Administrative expenses paid	0	0	0	0
7 Transfer payments	0	0	0	0
8 Acquisitions/(divestitures)	0	0	0	0
9 Settlements	0	0	0	0
10 Other adjustments	0	0	0	0
11 Fair value of plan assets at beginning of current fiscal year	89,573,343	89,573,343	0	0

C.5 Summary of net balances at January 1, 2023

All monetary amounts shown in US Dollars

	Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
A Summary of Net Prior Service Cost/(Credit)				
1 Net amount at 01/01/2023	0	0	0	0
2 Amortization amount during 2023	0	0	0	0
3 Plan amendments	0	0	0	0
4 Effect of curtailments	0	0	0	0
5 Other events	0	0	0	0
B Summary of Net Loss/(Gain)				
1 Net amount at 01/01/2023	44,857,312	44,747,720	25,147	84,445
2 Amount recognized during 2023	(565,434)	(558,477)	0	(6,957)
3 Effect of curtailments	0	0	0	0
4 Effect of settlements	0	0	0	0
5 Other events	0	0	0	0

C.6 Development of market related value of assets

All monetary amounts shown in US Dollars

	Total Pension	UPPCO Retirement Plan	UPPCO Restoration Plan	UPPCO SERP
Fiscal Year Ending	12/31/2022	12/31/2022	12/31/2022	12/31/2022
A Development of Market-Related Value of Assets				
1 Fair value of assets at current fiscal year end	89,573,343	89,573,343	N/A	N/A
2 Deferred investment gains/(losses) for prior periods				
Fiscal Year Gain/(Loss)				
a. 12/31/2022	(32,595,894)	(32,595,894)		
b. 12/31/2021	(2,072,014)	(2,072,014)	N/A	N/A
c. 12/31/2020	11,951,941	11,951,941	N/A	N/A
d. 12/31/2019	13,475,413	13,475,413	N/A	N/A
e. 12/31/2018	(10,843,853)	(10,843,853)	N/A	N/A
Percent Deferred				
a. 12/31/2022	80%	80%	N/A	N/A
b. 12/31/2021	60%	60%	N/A	N/A
c. 12/31/2020	40%	40%	N/A	N/A
d. 12/31/2019	20%	20%	N/A	N/A
e. 12/31/2018	0%	0%	N/A	N/A
Deferred Amount				
a. 12/31/2022	(26,076,715)	(26,076,715)	N/A	N/A
b. 12/31/2021	(1,243,208)	(1,243,208)	N/A	N/A
c. 12/31/2020	4,280,776	4,780,776	N/A	N/A
d. 12/31/2019	2,695,083	2,695,083	N/A	N/A
e. 12/31/2018	0	0	N/A	N/A
3 Market-related value of assets	109,417,407	109,417,407	N/A	N/A

C.7 Summary and comparison of benefit cost and cash flows

All monetary amounts shown in US Dollars

	Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
B Total Benefit Cost for Fiscal Year Ending 12/31/2023				
1 Employer service cost	524,929	524,929	0	0
2 Interest cost	4,216,810	4,196,825	15,071	4,914
3 Expected return on plan assets	(5,815,852)	(5,815,852)	0	0
4 Subtotal	(1,074,113)	(1,094,098)	15,071	4,914
5 Net prior service cost/(credit) amortization	0	0	0	0
6 Net loss/(gain) amortization	565,434	558,477	0	6,957
7 Subtotal	565,434	558,477	0	6,957
8 Net periodic benefit cost/(income)	(508,679)	(535,621)	15,071	11,871
9 Curtailment (gain)/loss	0	0	0	0
10 Settlement (gain)/loss	0	0	0	0
11 Special/contractual termination benefits	0	0	0	0
12 Other adjustments	0	0	0	0
13 Total benefit cost	(508,679)	(535,621)	15,071	11,871
C Assumptions				
1 Discount rate	5.40%	5.40%	5.30%	5.25%
2 Expected long-term rate of return on plan assets	5.50%	5.50%	N/A	N/A
3 Rate of compensation increase (non-administrative)	4.00%	4.00%	N/A	N/A
4 Census date	N/A	01/01/2023	01/01/2023	01/01/2023
D Assets at Beginning of Year				
1 Fair value	89,573,343	89,573,343	0	0
2 Market-related value	109,417,407	109,417,407	0	0

		Total	UPPCO Retirement	UPPCO Restoration	UPPCO SERP
E Cash Flows					
1	Expected				
a	Employer contributions	0	0	0	0
b	Plan participants' contributions	0	0	0	0
c	Benefits paid from Company assets	55,061	0	42,156	12,905
d	Benefits paid from plan assets	7,448,996	7,448,996	0	0
2	Actual				
a	Employer contributions	0	0	0	0
b	Plan participants' contributions	0	0	0	0
c	Benefits paid from Company assets	42,426	0	29,283	13,143
d	Benefits paid from plan assets	6,294,079	6,294,079	0	0
F Amortization Period					
1	For gain/loss amortization, if applicable	N/A	25.00000	7.91586	10.70109

JOHN S. THOMPSON Ph.D.

jst.fincap@outlook.com

SUMMARY

John Thompson holds a Ph.D. in Economics and a B.S. in Accounting. He has been consulting for approximately twelve years, including as an independent contractor to FINCAP, Inc. and EmployStats, in addition to his previous employment at Econ One Research. He consults on financial topics such as cost of capital, utilities regulation, reasonable rates of return, and the application of generally accepted financial models to the issue of return on equity for regulated utilities. In this regard, John has performed quantitative analyses and prepared testimony in numerous proceedings before state and federal regulatory agencies. Outside the regulated utility sector, John has also performed numerous economic damages analyses in the context of antitrust and other business disputes. This work has involved the analysis of disparate industries, the estimation of lost wages and lost sales, present value discounting, and economic impact studies.

Previously, John taught for approximately seventeen years at the university level, most recently in the McCombs School of Business and the Department of Economics at the University of Texas, where he taught in the MBA and executive MBA programs. As part of this teaching, he lectured on economic topics including revenue and cost structure, contribution margins, market structure and competition, economic and accounting profits; financial topics such as present value, discount rates and the cost of capital; and econometric topics such as sampling, OLS regression, and econometric modeling. John also taught undergraduates and MBAs in the Krannert School of Management at Purdue University.

EDUCATION and TRAINING

- Ph.D. in Economics, Auburn University, 1998. Specializations in Industrial Organization and International Economics. Dissertation on empirical methods in antitrust economics.
- B.S. in Accounting, Kansas University, 1994.
- Certified Valuation Analyst, National Association of Certified Valuation Analysts, 2010.

CONSULTING

FINCAP, Inc. • Consultant, 2019–present. Preparation and support of direct and rebuttal testimony concerning return on equity for regulated utilities in approximately 53 proceedings (as of October 2022) before state regulatory commissions and the Federal Energy Regulatory Commission. Clients have included regulated gas and electric utilities and natural gas pipelines.

EmployStats • Consultant, 2015–present. Preparation and support of direct and rebuttal testimony focusing primarily on damages analyses related to business disputes such as breach of contract,

covenants not to compete, and lost earnings capacity from employment disputes. Has also assisted with economic impact studies and class certification cases. Industries have included oilfield services, medical devices and physician services.

Corporate Sciences • Senior Manager and Economist, 2005–2006. Worked with managing principal to analyze damages and value privately held businesses.

Econ One Research • Economist, 2002–2005. Worked with managing principal, senior economists and analysts to analyze damages from antitrust and intellectual property disputes.

Other Independent Projects • Performed an overview of macroeconomic conditions in the Cayman Islands for the Cayman Islands Government (2008). Reviewed and critiqued a study of poverty in the Cayman Islands for the Cayman Islands Government (2008). Analyzed the economic impact of a commercial development project for a Cayman Islands consulting firm (2010).

TEACHING

University of Texas • Lecturer (finance and economics), 2015–2020. Taught microeconomic theory, microeconomic theory for business, MBA microeconomics and introduction to microeconomics.

Purdue University • Continuous Term Lecturer (economics), 2012–2014. Taught intermediate microeconomics, MBA macroeconomics, principles of macroeconomics and game theory. Area Coordinator for principles of macroeconomics. Visiting Assistant Professor (economics), 2009–2010. Taught labor, intermediate and advanced microeconomics.

Fu Jen Catholic University, ONPS International Summer School • Instructor (economics), 2013. Taught principles of microeconomics and macroeconomics, and econometrics.

Kansas State University • Visiting Assistant Professor (economics), 2010–2011. Taught intermediate microeconomics and principles of macroeconomics. Observed, evaluated and advised teaching GTAs.

University College of the Cayman Islands • Director of Graduate Studies and Executive Training (department), 2007–2008. Worked with the President and Dean to manage the inception of a new academic department and profit center. Chair of Business Studies (department), 2006–2007. Managed staff of twelve faculty members, responsible for hiring, academic scheduling, and strategic planning. Associate Professor (economics), 2006–2008. Taught numerous economics courses including labor, econometrics, international, and managerial economics.

Louisiana State University • Visiting Assistant Professor (economics), 1999–2002. Taught numerous economics courses including intermediate microeconomics, industrial organization and managerial (MBA) economics. Instructor (economics), 1997–1999. Taught survey of economics and principles of economics.

TEACHING AWARDS and HONORS

Distinguished Teacher, Purdue University (Krannert School of Management), 2012, 2013 and 2014.

Excellence in Teaching, Louisiana State University (College Freshmen), 1999.

Instructor of the Year, Louisiana State University (College of Business), 1998.

Graduate Teaching Assistant of the Year, Auburn University (Department of Economics), 1996.

RESEARCH

“Measures of Central Tendency for Cost of Equity Estimates,” (co-authored), filed with the Federal Energy Regulatory Commission (2019).

“After the fall: Stock price movements and the deterrent effect of antitrust enforcement,” (co-authored), *Review of Industrial Organization*, vol. 19, no. 3 (2001).

“Joint supply and modern economic theory: An historical perspective,” (co-authored), *History of Political Economy*, vol. 33, no. 3 (2001).

“A note on multiple choice exams, with respect to students’ risk preference and confidence, (co-authored), *Assessment & Evaluation in Higher Education*, vol. 26, no. 3 (2001).

Utility Regulatory Cases

Utility Case	Agency	Docket	Date	Nature of Case
Appalachian Power Co.	West Virginia PSC	18-0646-E-42T	Jun-18 Oct-18	Rate of Return on Equity
Baltimore Gas & Electric Co.	Maryland PSC	9406	Jun-18 Oct-18	Rate of Return on Equity
Midwest Independent System Operator, et al.	FERC	EL14-12	Feb-19 Apr-19	Rate of Return on Equity
Avista Corp.	Washington UTC	UE-190334 UG-190335	Apr-19	Rate of Return on Equity
NorthWestern Energy	FERC	ER19-1756	May-19	Rate of Return on Equity
Avista Corp.	Idaho PUC	AVU-E-19-04	Jun-19	Rate of Return on Equity
Florida Power & Light Co.	FERC	ER19-2585-000	Aug-19	Rate of Return on Equity
Jersey Central Power & Light Co.	FERC	ER20-227	Oct-19	Rate of Return on Equity
New Mexico Gas Co.	New Mexico PRC	19-00317-UT	Dec-19 Jul-20	Rate of Return on Equity
DATC Path 15, LLC	FERC	ER20-1006	Feb-20	Rate of Return on Equity
Dayton Power and Light Co.	FERC	ER20-1150	Mar-20	Rate of Return on Equity
Baltimore Gas & Electric Co.	Maryland PSC	9645	Mar-20 Sep-20 20 Oct-20	Rate of Return on Equity
Black Hills Nebraska Gas, Inc.	Nebraska PSC	NG-109	Jun-20 Oct-20	Rate of Return on Equity
Ohio Power Co.	Ohio PUC	20-585-EL-AIR	Jun-20 Jan-21	Rate of Return on Equity
Pacific Gas & Electric Co.	FERC	ER20-2878	Sep-20	Rate of Return on Equity

Qualifications of John S. Thompson

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Black Hills Colorado Gas, Inc.	Colorado PUC	20AL-0380G	Sep-20	Rate of Return on Equity
Potomac Electric Co.	Maryland PSC	9655	Oct-20 Mar-21	Rate of Return on Equity
Avista Corp.	Washington UTC	UE-200900 UG-200901	Oct-20 May-21	Rate of Return on Equity
Kentucky Utilities Co.	Kentucky PSC	2020-00349	Nov-20 Apr-21	Rate of Return on Equity
Louisville Gas & Electric Co.	Kentucky PSC	2020-00350	Nov-20 Apr-21	Rate of Return on Equity
Dayton Power and Light Co.	Ohio PUC PSC	20-1651-EL-AIR	Dec-20 Aug-21	Rate of Return on Equity
Avista Corp.	Idaho PUC	AVU-E-21-01; AVU-G-21-01	Jan-21	Rate of Return on Equity
Public Service Co. of Oklahoma	Oklahoma CC	202100055	Apr-21 Aug-21	Rate of Return on Equity
Black Hills/Kansas Gas Utility Co. LLC	Kansas SCC	21-BHCG-418-RTS	May-21 Oct-21	Rate of Return on Equity
NorthWestern Energy	Montana PSC	D2021.02. 022	May-21	Rate of Return on Equity
Black Hills Colorado Gas, Inc.	Colorado PUC	21AL-0236G	Jun-21	Rate of Return on Equity
Avista Corp.	FERC	ER21-2198	Jun-21	Rate of Return on Equity
Black Hills/Iowa Gas Utility Co., LLC	Iowa UB	RPU-2021-0002	Jun-21 Oct-21	Rate of Return on Equity
Kentucky Utilities Company d/b/a Old Dominion Power Co.	Virginia SCC	PUR-2021-00171	Aug-21 Mar-22	Rate of Return on Equity
Delmarva Power Co.	Maryland PSC	9670	Aug-21 Dec-21	Rate of Return on Equity
El Paso Electric Co.	FERC	ER22-282	Oct-21	Rate of Return on Equity

Portland General Electric Co.	FERC	ER22-233	Oct-21	Rate of Return on Equity
Avista Corp.	Oregon PUC	UG-433	Oct-21	Rate of Return on Equity
Ohio Power Co.	Ohio PUC	21-1166-EL-UNC	Nov-21	Application of Significantly Excessive Earnings Test
Black Hills Energy Arkansas, Inc.	Arkansas PSC	21-097-U	Dec-21 Jun-22 Aug-22	Rate of Return on Equity
Avista Corp.	Washington UTC	UE-220053 UG-220054	Jan-22 Aug-22	Rate of Return on Equity
Rockland Electric Co.	FERC	ER22-910	Jan-22	Rate of Return on Equity
Niagara Mohawk Power Co.	FERC	ER22-1201	Mar-22	Rate of Return on Equity
Delmarva Power Co.	Maryland PSC	9681	May-22 Sep-22	Rate of Return on Equity
Cheyenne Light, Fuel and Power Co.	Wyoming PSC	17072	Jun-22	Rate of Return on Equity
Black Hills Colorado Electric, LLC	FERC	ER22-2185	Jun-22	Rate of Return on Equity
Alaska Electric Light and Power Co.	RC of Alaska	U-22-078	Jul-22	Rate of Return on Equity
NorthWestern Energy	Montana PSC	D2022.07. 078	Aug-22	Rate of Return on Equity
Westfield Gas Corp. d/b/a Citizens Gas of Westfield	Indiana URC	Cause No. 45761	Aug-22 Jan-23	Rate of Return on Equity
Rocky Mountain Natural Gas LLC	Colorado PUC	22AL-0426G	Oct-22	Rate of Return on Equity
Public Service Co. of Oklahoma	Oklahoma CC	PUD 2022-000093	Nov-22	Rate of Return on Equity
Public Service Co. of New Mexico	New Mexico PRC	22-00270-UT	Dec-22	Rate of Return on Equity

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Avista Corp.	Idaho PUC	AVU-E-23-01; AVU-G-23-01	Jan-23	Rate of Return on Equity
Ohio Power Co.	Ohio PUC	23-23-EL-SSO	Jan-23	Rate of Return on Equity
Upper Peninsula Power Company	Michigan PSC	U-21286	Oct-22 Feb-23	Rate of Return on Equity
Baltimore Gas & Electric Co.	Maryland PSC	9692	Feb-23	Rate of Return on Equity
Mountaineer Gas	West Virginia PSC	23-0280-G-42T	Feb-23	Rate of Return on Equity
Avista Corp.	Oregon PUC	UG-461	Feb-23	Rate of Return on Equity
Appalachian Power Co.	Virginia SCC	PUR-2023- 00001	Mar-23	Rate of Return on Equity
Potomac Electric Co.	DC PSC	1176	Apr-23	Rate of Return on Equity
Black Hills Colorado Gas, Inc.	Colorado PUC	23AL-0231G	May-23	Rate of Return on Equity
Black Hills Wyoming Gas, Inc.	Wyoming PSC	30026-78-GR-23	May-23	Rate of Return on Equity
Potomac Electric Co.	Maryland PSC	9702	May-23	Rate of Return on Equity
Idaho Power Co.	Idaho PUC	IPC-E-23-11	Jun-23	Rate of Return on Equity
Consolidated Edison Co. of New York	FERC	ER23-2212	Jun-23	Rate of Return on Equity
NorthWestern Energy	South Dakota PUC	EL23-016	Jun-23	Rate of Return on Equity
Kentucky Power Co.	Kentucky PSC	2023-00159	Jun-23	Rate of Return on Equity
Indianapolis Power & Light Co.	Indiana URC	Cause No. 45911	Jun-23 Nov-23	Rate of Return on Equity
Entergy Louisiana, LLC	Louisiana PSC	U-36959	Aug-23	Rate of Return on Equity
Florida Power & Light Co.	FERC	ER24-268	Oct-23	Rate of Return on Equity

Viridon Mid-Atlantic LLC	FERC	ER24-506	Nov-23	Rate of Return on Equity
Avista Corp.	Washington UTC	UE-240006 UG-240007	Jan-24	Rate of Return on Equity
Public Service Co. of Oklahoma	Oklahoma CC	PUD 2023-000086	Jan-24	Rate of Return on Equity
Upper Peninsula Power Company	Michigan PSC	N/A	Feb-24	Rate of Return on Equity

Business and Employment Cases

Case	State	Docket	Date	Nature of Case
Schlumberger Tech v. Parker	District Court of Fort Bend County, Texas, 268th Judicial District	14-DCV-218252	Apr.-15	Business Damages
Mark Virant v. Encana Oil	Texas District Court of Tarrant County, Texas, 153rd Judicial District	153-266960-13	Jun.-15	Employment Damages
Brenda Theriot v. Health & Human Services	US Court of Federal Claims, Washington, D.C.	13-778V	Jun.-15	Personal Injury Damages
Lucas v. Breg	Superior Court of the State of California, County of San Diego	37-2011-00092818-CU-AT-CTL	Mar.-16	Product Liability Damages
Kimberly Trimmer-Davis v. COH	Texas District Court of Harris County, Texas, 295th Judicial District	2010-11410	May-16	Employment Damages
Nudelman MD v. Volk MD	US District Court, Western District of Texas, San Antonio Division	5:15-CV-00923-FB	Sep.-16	Employment Damages, Real Estate Valuation

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Rowell v. Attorney General of the State of Texas, et. al.	US District Court, Western District of Texas, Austin Division	1:14-CV-00190-LY	Nov.-17	Economic Damages
Huntsman v. Southwest Airlines	US District Court, Northern District of California, San Francisco Division	3:17-CV-03972-JD	Mar.-18	Employment Damages
Mulcahy v. Cielo	Texas District Court of Travis County, Texas, 250th Judicial District	D-1-GN-18-003429	Nov.-18	Employment Damages, Real Estate Valuation
C2 Education v. Lee	US District Court, Northern District of California	3:18-02920-SI	Jul.-19	Business Damages
Gallagher v. Webster and Epic Insurance Brokers	Texas District Court of Travis County, Texas, 345th Judicial District	D-1-GN-20-004823	Jul.-21	Business Damages
Pappas Harris Capital v. Advance Hydrocarbon Corp. et al.	Texas District Court, 295th District Court, Harris County	202010778	Feb.-22	Business Valuation
State of Texas and Texas HSC v. Chiquita Brooks-Lasure et al.	US District Court, Eastern District of Texas, Tyler	6:21-CV-00191	Feb.-22	Economic Impact Study
Townsley et al. v. IBM Corp.	US District Court, Western District of Texas, Austin	1:20-CV-00969-LY	Mar.-22	Wrongful Termination Damages
Georgann Oglesby v. Medtronic, Inc.	US District Court, Western District of Texas, San Antonio	5:20-CV-1267	Jun.-22	Personal Injury Damages
Beadles, Newman & Lawler v. Newman and James Lawler et al.	Texas District Court, 96th District Court, Tarrant County	096-283896-16	Jan.-23	Business Valuation

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Xoticas Rio Grande Valley v. City of Pharr, Texas et al.	US District Court, Southern District of Texas, Laredo	5:21-CV-00120	Jan.-23	Business Damages
Reloj v. Government Employees Insurance Company Inc.	US District Court, Southern District of California	'21CV1751 L AGS	May-23	Wage and Hour
Clark v. Freeport LNG Development, L.P.	Texas District Court, 295th District Court, Harris County	2022-25093	Jun.-23	Wrongful Termination Damages
Mullings v. Sam Houston State University	US District Court, Southern District of Texas, Houston	4:22cv1366	Jun.-23	Wrongful Termination Damages
Stapleton v. Prince Carpentry, Inc.	US District Court, Eastern District of New York	22-CV-04044(JS)(JM W)	Jun.-23	Wrongful Termination Damages
Gomez v. Willacy County	Texas District Court, District Court, Willacy County	2022-CV-0092-A	Jun.-23	Wrongful Death Damages
Loftin v. Credit Human FCU	US District Court, Western District of Texas, San Antonio	5:22-cv-1343	Jun.-23	Wrongful Termination Damages
Moot v. LinkedIn	JAMS Arbitration	N/A	Aug.-23	Wrongful Termination Damages
Matthew v. TCPA	US District Court, Southern District of New York	N/A	Aug.-23	Wrongful Termination Damages
Valentin v. Town of Natick	US District Court, District of Massachusetts	N/A	Aug.-23	Business Damages
Harris v. Ascend Performance Materials	US District Court, Southern District of Texas, Galveston	3:22-cv-178	Aug.-23	Wrongful Termination Damages
Hart v TRIARC Systems	US Bankruptcy Court, Northern District of Texas,	23-41996-mxm	Aug.-23	Business Damages

Fort Worth				
Contreras v. RBFCU	US District Court, Western District of Texas	1:22-cv-01284- LY	Sep.-23	Wrongful Termination Damages
Casis Village Shell v. Malone et al.	District Court, 98th Judicial District, Travis County, Texas	D-1-GN-23- 001481	Sep.-23	Business Damages
Mowen v. USAA	American Arbitration Association	01-23-0000- 8763	Sep.-23	Wrongful Termination Damages
FBCC CityPoint v. City of Austin et al.	US District Court, Western District of Texas, Austin	1:22-cv-01272	Sep.-23	Business Damages
Washington v. Raytheon Company	US District Court, Eastern District of Texas, Sherman	4:22-cv-514	Sep.-23	Wrongful Termination Damages
Robert Fisherkeller v BASF Corp.	US District Court, Northern District of Texas, Fort Worth	N/A	Jan.-24	Wrongful Termination Damages
Nickel Bridge Capital v Hendrickson	US District Court, Southern District of Texas, Houston	4:23-cv-1047	Jan.-24	Business Damages
Connolly v BioMarin	US District Court, Southern District of Texas, Houston	N/A	Jan.-24	Wrongful Termination Damages
Guerra v Castillo	US District Court, Southern District of Texas, McAllen	7:20-CV-0401	Feb.-24	Wrongful Termination Damages

ROE ANALYSIS

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SUMMARY OF RESULTS

Method	Average
DCF	
Value Line	9.8%
IBES	10.4%
Zacks	10.1%
Internal br + sv	9.3%
CAPM	12.2%
Utility Risk Premium	10.8%

ROE Recommendation

Cost of Equity

Range	10.4%	--	11.4%
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REGULATORY MECHANISMS

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UTILITY GROUP

Company	Type of Adjustment Clause (a)									(b)	(c)
	Fuel/PPA	Conserv. Program Expense	Decoupling		New Capital				Trans. Costs	Future Test Year	Formula Rates / MRP
			Full	Partial	Trad. Generation	Renewables/ Non-Trad.	Delivery Infra.	Environ. Compliance			
1 Algonquin Pwr & Util	✓	✓	--	✓	--	--	✓	✓	✓	P	✓
2 ALLETE	✓	✓	--	--	--	✓	--	--	✓	C	✓
3 Avangrid, Inc.	D	✓	✓	--	--	✓	✓	--	✓	C	✓
4 Avista Corp.	✓	✓	✓	--	--	--	--	--	--	P	✓
5 Black Hills Corp.	✓	✓	--	✓	✓	✓	--	✓	✓	O	✓
6 CenterPoint Energy	✓	✓	--	✓	--	--	✓	✓	✓	--	✓
7 CMS Energy Corp.	✓	✓	--	--	--	✓	--	--	✓	C	--
8 Dominion Energy	✓	✓	--	--	✓	✓	✓	✓	✓	--	✓
9 DTE Energy Co.	✓	✓	--	--	--	✓	--	--	✓	C	--
10 Duke Energy Corp.	✓	✓	--	✓	✓	✓	✓	✓	✓	C,O,P	✓
11 Edison International	✓	--	✓	--	--	--	--	--	--	C	✓
12 Emera Inc.	✓	✓	--	--	✓	✓	--	✓	--	C	✓
13 Entergy Corp.	✓	✓	--	✓	✓	✓	✓	✓	✓	O,P	✓
14 Evergy Inc.	✓	✓	--	✓	--	✓	✓	✓	✓	P	--
15 Exelon Corp.	D	✓	✓	✓	--	✓	✓	✓	✓	O,P	✓
16 IDACORP, Inc.	✓	✓	✓	--	--	--	--	--	--	C,P	--
17 NorthWestern Corp.	✓	✓	--	--	--	--	--	--	--	--	--
18 OGE Energy Corp.	✓	✓	--	✓	✓	✓	✓	✓	✓	P	✓
19 Otter Tail Corp.	✓	✓	--	--	✓	✓	✓	✓	✓	C,O	✓
20 Pinnacle West Capital	✓	✓	--	✓	--	✓	--	✓	✓	--	✓
21 PNM Resources	✓	✓	--	--	--	✓				O	✓
22 Sempra Energy	✓	✓	✓	--	--	--	✓	--	✓	C	✓
23 Southern Company	✓	--	--	✓	✓	✓	--	✓	--	C,O	✓

Notes

D - Delivery-only utility.

C - Fully-forecasted test years commonly used in the state listed for this operating company.

O - Fully-forecasted test years occasionally used in the state listed for this operating company.

P - Partially-forecasted test years commonly or occasionally used in the state listed for this operating company.

Source: A-45 (JST-3), pages 2-3, contain operating company data that are aggregated into the parent company data on this page.

REGULATORY MECHANISMS

Case No.: U-21555

Exhibit: A-45 (JST-3)

Witness: John S. Thompson

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UTILITY GROUP OPERATING COS.

	Company	State	Fuel/PPA	Type of Adjustment Clause (a)									(b)	(c)
				Conserv. Program Expense	Decoupling		New Capital					Trans. Costs	Future Test Year	Formula Rates / MRP
					Full	Partial	Trad. Generation	Renewables/ Non-Trad.	Delivery Infra.	Environ. Compliance				
1	ALGONQUIN PWR. & UTIL.													
	Empire District Electric Co.	KS	✓	✓	*	--	--	--	--	--	✓	✓	--	--
	Empire District Electric Co.	MO	✓	--	--	--	--	--	--	*	--	✓	*	P
	Liberty Utilities (Granite State Elec.) Corp.	NH	D	*	✓	--	✓	*	--	✓	*	✓	--	✓
2	ALLETE													
	Minnesota Power Enterprises Inc.	MN	✓	✓	--	--	--	✓	--	--	✓	C	✓	
3	AVANGRID													
	United Illuminating Co.	CT	D	*	✓	✓	*	--	--	*	--	✓	C	✓
	Central Maine Power Co.	ME	D	*	--	✓	*	--	--	--	--	✓	C	✓
	New York State Elec. & Gas Co.	NY	D	✓	✓	--	--	✓	*	✓	*	--	C	✓
	Rochester Gas & Elec. Corp.	NY	D	✓	✓	--	--	✓	*	--	--	--	C	✓
4	AVISTA CORP.													
	Alaska Electric Light & Power Co.	AK	✓	--	--	--	--	--	--	--	--	--	--	--
	Avista Corp.	ID	✓	*	✓	✓	*	--	--	--	--	--	P	--
	Avista Corp.	WA	✓	*	✓	✓	--	*	--	--	--	--	--	✓
5	BLACK HILLS CORP.													
	Black Hills Colorado Electric Inc.	CO	✓	✓	--	--	✓	*	✓	--	--	✓	--	✓
	Black Hills Power Inc.	SD	✓	--	--	--	--	--	--	✓	*	✓	*	--
	Cheyenne Light Fuel & Power Co.	WY	✓	✓	--	✓	*	--	--	--	--	--	O	--
6	CENTERPOINT ENERGY													
	Southern Indiana Gas & Electric Co.	IN	✓	✓	--	✓	*	--	--	✓	*	✓	--	✓
	CenterPoint Energy Houston Electric LLC	TX	--	*	✓	--	--	--	--	✓	--	✓	--	✓
7	CMS ENERGY													
	Consumers Energy Co.	MI	✓	✓	--	*	--	--	✓	--	--	✓	*	C
8	DOMINION ENERGY													
	Virginia Electric & Power Co.	NC	✓	✓	*	--	--	*	✓	*	--	✓	--	--
	Dominion Energy South Carolina	SC	✓	✓	--	--	✓	*	--	--	✓	--	--	✓
	Virginia Electric & Power Co.	VA	✓	✓	--	--	✓	✓	✓	✓	✓	✓	--	✓
9	DTE ENERGY CO.													
	DTE Electric Co.	MI	✓	✓	--	*	--	--	✓	--	--	✓	*	C

Case No.: U-21555
Exhibit: A-45 (JST-3)
Witness: John S. Thompson
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[illegible]

REGULATORY MECHANISMS

Case No.: U-21555

Exhibit: A-45 (JST-3)

Witness: John S. Thompson

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UTILITY GROUP OPERATING COS.

Company	State	Fuel/PPA	Type of Adjustment Clause (a)										(b)	(c)	
			Conserv. Program Expense	Decoupling		New Capital					Trans. Costs	Future Test Year	Formula Rates / MRP		
				Full	Partial	Trad. Generation	Renewables/ Non-Trad.	Delivery Infra.	Environ. Compliance						
17 NORTHWESTERN CORP.															
NorthWestern Corp.	MT	✓	*	✓	--	--	--	--	--	--	--	--	--	--	
NorthWestern Corp.	SD	✓		✓	--	--	--	--	--	--	--	--	--	--	
18 OGE ENERGY CORP.															
Oklahoma Gas & Electric Co.	AR	✓		✓	--	✓	*	✓	✓	✓	✓	✓	P	--	
Oklahoma Gas & Electric Co.	OK	✓		✓	*	--	✓	*	--	✓	*	✓	*	--	✓
19 OTTER TAIL CORP.															
Otter Tail Power Co.	MN	✓		✓	--	--	--	✓	--	✓	✓	✓	C	--	
Otter Tail Power Co.	ND	✓		--	--	--	✓	*	✓	*	✓	*	✓	✓	
Otter Tail Power Corp.	SD	✓		✓	--	--	✓	*	--	✓	✓	--	--	--	
20 PINNACLE WEST CAPITAL															
Arizona Public Service Co.	AZ	✓		✓	--	✓	*	--	✓	--	✓	✓	--	✓	
21 PNM RESOURCES															
Public Service Co. of New Mexico	NM	✓		✓	--	--	--	✓	--	--	--	--	O	--	
Texas-New Mexico Power Co.	TX	D	*	✓	--	--	--	--	✓	--	✓	✓	--	✓	
22 SEMPRA ENERGY															
San Diego Gas & Electric Co.	CA	✓		--	✓	--	--	--	--	--	--	--	C	✓	
Oncor Electric Delivery Co.	TX	D	*	✓	--	--	--	--	✓	--	✓	✓	--	✓	
23 SOUTHERN CO.															
Alabama Power Co.	AL	✓	*	--	--	--	✓	*	✓	--	✓	*	--	C	✓
Georgia Power Co.	GA	✓		--	--	--	✓	*	--	--	✓	*	--	C	✓
Mississippi Power Co.	MS	✓		--	--	✓	*	--	--	--	✓	*	--	O	✓

(a) S&P Global Market Intelligence, *Adjustment clauses: A state by state overview*, Regulatory Focus Topical Special Report (Jul. 18, 2022).

(b) Edison Electric Institute, *Alternative Regulation for Emerging Utility Challenges: 2015 Update* (Nov. 11, 2015).

(c) Formula rates and Multiyear Rate plans approved in the state listed for this operating company. See, U.S. Department of Energy, *State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities*, GRID Modernization Laboratory Consortium (Jul. 2017); The Brattle Group, *Exploring the Use of Alternative Regulatory Mechanisms to Establish New Base Rates*, Joint Utilities of Maryland (Mar. 29, 2018).

Notes

D - Delivery-only utility.

C - Fully-forecasted test years commonly used in the state listed for this operating company.

O - Fully-forecasted test years occasionally used in the state listed for this operating company.

P - Partially-forecasted test years commonly or occasionally used in the state listed for this operating company.

* For additional context around the specific recovery mechanisms available to the particular operating companies in each state, see the source document.

DIVIDEND YIELD

		(a)	(b)	
	Company	Price	Dividends	Yield
1	Algonquin Pwr & Util	\$ 6.14	\$ 0.43	7.1%
2	ALLETE	\$ 60.02	\$ 2.82	4.7%
3	Avangrid, Inc.	\$ 31.68	\$ 1.76	5.6%
4	Avista Corp.	\$ 34.55	\$ 1.84	5.3%
5	Black Hills Corp.	\$ 52.40	\$ 2.60	5.0%
6	CenterPoint Energy	\$ 28.18	\$ 0.80	2.8%
7	CMS Energy Corp.	\$ 57.58	\$ 1.95	3.4%
8	Dominion Energy	\$ 46.29	\$ 2.67	5.8%
9	DTE Energy Co.	\$ 106.80	\$ 4.08	3.8%
10	Duke Energy Corp.	\$ 96.51	\$ 4.14	4.3%
11	Edison International	\$ 68.90	\$ 3.14	4.6%
12	Emera Inc.	\$ 49.42	\$ 2.88	5.8%
13	Entergy Corp.	\$ 100.78	\$ 4.52	4.5%
14	Evergy Inc.	\$ 51.48	\$ 2.57	5.0%
15	Exelon Corp.	\$ 35.26	\$ 1.53	4.3%
16	IDACORP, Inc.	\$ 94.22	\$ 3.32	3.5%
17	NorthWestern Corp.	\$ 48.91	\$ 2.60	5.3%
18	OGE Energy Corp.	\$ 33.79	\$ 1.67	4.9%
19	Otter Tail Corp.	\$ 88.04	\$ 1.75	2.0%
20	Pinnacle West Capital	\$ 70.53	\$ 3.54	5.0%
21	PNM Resources	\$ 37.43	\$ 1.55	4.1%
22	Sempra Energy	\$ 73.02	\$ 1.50	2.1%
23	Southern Company	\$ 69.63	\$ 2.86	4.1%
	Average			4.5%

(a) Average of closing prices for 30 trading days ended Feb. 9, 2024.

(b) The Value Line Investment Survey, Summary & Index (Feb. 9, 2024).

DCF MODEL - UTILITY GROUP**Case No.:****U-21555****Exhibit:****A-46 (JST-4)****Witness:****John S. Thompson****Page:****2 of 3****GROWTH RATES**

	Company	(a)	(b)	(c)	(d)
		Earnings Growth			br+sv
		V Line	IBES	Zacks	Growth
1	Algonquin Pwr & Util	n/a	0.3%	n/a	n/a
2	ALLETE	6.0%	8.1%	8.1%	4.8%
3	Avangrid, Inc.	3.0%	-1.4%	3.6%	1.7%
4	Avista Corp.	6.0%	6.2%	6.2%	2.7%
5	Black Hills Corp.	3.0%	0.7%	n/a	3.4%
6	CenterPoint Energy	8.5%	-1.1%	7.5%	4.9%
7	CMS Energy Corp.	5.5%	7.8%	7.7%	6.2%
8	Dominion Energy	0.5%	-5.1%	7.9%	4.0%
9	DTE Energy Co.	4.5%	5.1%	6.0%	6.2%
10	Duke Energy Corp.	5.0%	6.8%	5.3%	4.6%
11	Edison International	4.5%	5.5%	3.7%	6.1%
12	Emera Inc.	10.5%	4.2%	n/a	5.6%
13	Entergy Corp.	0.5%	11.0%	7.0%	4.9%
14	Eversource Inc.	7.5%	2.5%	4.4%	3.9%
15	Exelon Corp.	n/a	4.2%	5.7%	4.4%
16	IDACORP, Inc.	4.0%	4.4%	4.4%	3.8%
17	NorthWestern Corp.	3.5%	4.1%	5.2%	2.9%
18	OGE Energy Corp.	6.5%	-12.3%	4.0%	5.1%
19	Otter Tail Corp.	4.5%	9.0%	n/a	4.7%
20	Pinnacle West Capital	2.5%	5.9%	4.0%	3.7%
21	PNM Resources	5.0%	6.3%	37.0%	5.4%
22	Sempra Energy	6.5%	4.1%	5.0%	6.1%
23	Southern Company	6.5%	7.1%	4.0%	6.4%

(a) The Value Line Investment Survey (Dec. 8, 2023; Jan. 19 and Feb. 9, 2024).

(b) www.finance.yahoo.com (retrieved Feb. 17, 2024).

(c) www.zacks.com (retrieved Feb. 17, 2024).

(d) See A-47 (JST-5).

COST OF EQUITY ESTIMATES

	(a)	(a)	(a)	(a)
	V Line	IBES	Zacks	br+sv Growth
1 Algonquin Pwr & Util	n/a	7.4%	n/a	n/a
2 ALLETE	10.7%	12.8%	12.8%	9.5%
3 Avangrid, Inc.	8.6%	4.2%	9.2%	7.2%
4 Avista Corp.	11.3%	11.5%	11.5%	8.0%
5 Black Hills Corp.	8.0%	5.7%	n/a	8.4%
6 CenterPoint Energy	11.3%	1.8%	10.3%	7.7%
7 CMS Energy Corp.	8.9%	11.2%	11.1%	9.6%
8 Dominion Energy	6.3%	0.6%	13.7%	9.8%
9 DTE Energy Co.	8.3%	8.9%	9.8%	10.1%
10 Duke Energy Corp.	9.3%	11.1%	9.5%	8.9%
11 Edison International	9.1%	10.1%	8.2%	10.6%
12 Emera Inc.	16.3%	10.0%	n/a	11.4%
13 Entergy Corp.	5.0%	15.5%	11.5%	9.4%
14 Evergy Inc.	12.5%	7.5%	9.3%	8.8%
15 Exelon Corp.	n/a	8.5%	10.0%	8.7%
16 IDACORP, Inc.	7.5%	7.9%	7.9%	7.3%
17 NorthWestern Corp.	8.8%	9.4%	10.5%	8.2%
18 OGE Energy Corp.	11.4%	-7.4%	8.9%	10.0%
19 Otter Tail Corp.	6.5%	11.0%	n/a	6.7%
20 Pinnacle West Capital	7.5%	10.9%	9.0%	8.7%
21 PNM Resources	9.1%	10.4%	41.2%	9.5%
22 Sempra Energy	8.6%	6.2%	7.0%	8.1%
23 Southern Company	10.6%	11.2%	8.1%	10.6%
Average (b)	9.8%	10.4%	10.1%	9.3%

(a) Sum of dividend yield (A-46 (JST-4), p. 1) and respective growth rate (A-46 (JST-4), p. 2).

(b) Excludes highlighted values.

BR+SV GROWTH RATE

Case No.: U-21555
Exhibit: A-47 (JST-5)
Witness: John S. Thompson
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UTILITY GROUP

		(a)	(a)	(a)	(b)	(c)	(d)	(e)		(f)	(g)		
		2027			Adjustment						"sv" Factor		
	Company	EPS	DPS	BVPS	b	r	Factor	Adjusted r	br	s	v	sv	br + sv
1	Algonquin Pwr & Util	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2	ALLETE	\$5.00	\$3.00	\$54.00	40.0%	9.3%	1.0217	9.5%	3.8%	0.0271	0.3647	0.99%	4.8%
3	Avangrid, Inc.	\$2.65	\$1.76	\$53.65	33.6%	4.9%	1.0058	5.0%	1.7%	-	(0.3413)	0.00%	1.7%
4	Avista Corp.	\$2.90	\$2.20	\$38.25	24.1%	7.6%	1.0333	7.8%	1.9%	0.0333	0.2350	0.78%	2.7%
5	Black Hills Corp.	\$4.50	\$2.82	\$55.00	37.3%	8.2%	1.0257	8.4%	3.1%	0.0170	0.1538	0.26%	3.4%
6	CenterPoint Energy	\$1.95	\$0.95	\$21.50	51.3%	9.1%	1.0387	9.4%	4.8%	0.0021	0.3385	0.07%	4.9%
7	CMS Energy Corp.	\$3.75	\$2.30	\$27.75	38.7%	13.5%	1.0198	13.8%	5.3%	0.0149	0.6036	0.90%	6.2%
8	Dominion Energy	\$4.00	\$2.67	\$39.00	33.3%	10.3%	1.0199	10.5%	3.5%	0.0155	0.3500	0.54%	4.0%
9	DTE Energy Co.	\$8.30	\$4.65	\$60.75	44.0%	13.7%	1.0299	14.1%	6.2%	0.0007	0.5881	0.04%	6.2%
10	Duke Energy Corp.	\$7.50	\$4.30	\$70.00	42.7%	10.7%	1.0045	10.8%	4.6%	-	0.4510	0.00%	4.6%
11	Edison International	\$6.00	\$3.66	\$42.25	39.0%	14.2%	1.0178	14.5%	5.6%	0.0084	0.5171	0.43%	6.1%
12	Emera Inc.	\$5.70	\$3.24	\$49.30	43.2%	11.6%	1.0181	11.8%	5.1%	0.0111	0.4670	0.52%	5.6%
13	Entergy Corp.	\$7.50	\$5.00	\$73.90	33.3%	10.1%	1.0293	10.4%	3.5%	0.0315	0.4526	1.42%	4.9%
14	Evergy Inc.	\$4.85	\$3.05	\$47.50	37.1%	10.2%	1.0142	10.4%	3.8%	0.0002	0.4412	0.01%	3.9%
15	Exelon Corp.	\$3.15	\$1.89	\$29.75	40.0%	10.6%	1.0140	10.7%	4.3%	0.0019	0.4591	0.09%	4.4%
16	IDACORP, Inc.	\$6.10	\$4.15	\$66.00	32.0%	9.2%	1.0235	9.5%	3.0%	0.0169	0.4383	0.74%	3.8%
17	NorthWestern Corp.	\$4.15	\$2.72	\$51.50	34.5%	8.1%	1.0173	8.2%	2.8%	0.0083	0.1043	0.09%	2.9%
18	OGE Energy Corp.	\$3.15	\$1.85	\$26.00	41.3%	12.1%	1.0102	12.2%	5.1%	-	0.3882	0.00%	5.1%
19	Otter Tail Corp.	\$3.65	\$2.20	\$34.25	39.7%	10.7%	1.0199	10.9%	4.3%	0.0079	0.4731	0.37%	4.7%
20	Pinnacle West Capital	\$5.70	\$3.73	\$62.00	34.6%	9.2%	1.0206	9.4%	3.2%	0.0166	0.2914	0.48%	3.7%
21	PNM Resources	\$3.35	\$1.85	\$31.95	44.8%	10.5%	1.0264	10.8%	4.8%	0.0149	0.3610	0.54%	5.4%
22	Sempra Energy	\$6.00	\$3.05	\$55.00	49.2%	10.9%	1.0313	11.3%	5.5%	0.0122	0.4500	0.55%	6.1%
23	Southern Company	\$5.15	\$3.10	\$32.25	39.8%	16.0%	1.0141	16.2%	6.4%	-	0.6206	0.00%	6.4%

BR+SV GROWTH RATE

Case No.: U-21555
Exhibit: A-47 (JST-5)
Witness: John S. Thompson
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UTILITY GROUP

	(a)	(a)	(h)	(a)	(a)	(h)	(i)	(a)	(a)		(j)	(a)	(a)	(i)
	2022			2027			Chg	2027				Common Shares		
Company	Eq Ratio	Tot Cap	Com Eq	Eq Ratio	Tot Cap	Com Eq	Equity	High	Low	Avg.	M/B	2022	2027	Growth
1 Algonquin Pwr & Util	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2 ALLETE	59.6%	\$4,458	\$2,657	59.5%	\$5,550	\$3,302	4.4%	\$100.0	\$70.0	\$85.0	1.574	56.01	61.00	1.72%
3 Avangrid, Inc.	68.5%	\$28,500	\$19,523	57.0%	\$36,300	\$20,691	1.2%	\$50.0	\$30.0	\$40.0	0.746	387.00	387.00	0.00%
4 Avista Corp.	49.6%	\$4,710	\$2,336	53.0%	\$6,150	\$3,260	6.9%	\$60.0	\$40.0	\$50.0	1.307	74.95	85.00	2.55%
5 Black Hills Corp.	45.4%	\$6,602	\$2,997	46.0%	\$8,425	\$3,876	5.3%	\$80.0	\$50.0	\$65.0	1.182	66.10	71.00	1.44%
6 CenterPoint Energy	37.1%	\$24,878	\$9,230	42.5%	\$32,000	\$13,600	8.1%	\$40.0	\$25.0	\$32.5	1.512	629.54	634.00	0.14%
7 CMS Energy Corp.	33.6%	\$20,205	\$6,789	35.5%	\$23,300	\$8,272	4.0%	\$85.0	\$55.0	\$70.0	2.523	291.27	300.00	0.59%
8 Dominion Energy	44.5%	\$62,975	\$28,024	44.0%	\$77,700	\$34,188	4.1%	\$70.0	\$50.0	\$60.0	1.538	837.00	880.00	1.01%
9 DTE Energy Co.	37.0%	\$25,158	\$9,308	39.0%	\$32,200	\$12,558	6.2%	\$170.0	\$125.0	\$147.5	2.428	205.69	206.00	0.03%
10 Duke Energy Corp.	41.5%	\$124,525	\$51,678	37.5%	\$144,100	\$54,038	0.9%	\$145.0	\$110.0	\$127.5	1.821	770.00	770.00	0.00%
11 Edison International	30.6%	\$44,547	\$13,631	27.0%	\$60,300	\$16,281	3.6%	\$105.0	\$70.0	\$87.5	2.071	382.21	390.00	0.40%
12 Emera Inc.	42.1%	\$27,171	\$11,427	42.2%	\$32,500	\$13,700	3.7%	\$110.0	\$75.0	\$92.5	1.876	269.95	278.00	0.59%
13 Entergy Corp.	35.2%	\$36,810	\$12,957	35.5%	\$48,910	\$17,363	6.0%	\$155.0	\$115.0	\$135.0	1.827	211.18	230.00	1.72%
14 Evergy Inc.	48.0%	\$19,668	\$9,441	46.5%	\$23,400	\$10,881	2.9%	\$100.0	\$70.0	\$85.0	1.789	229.90	230.00	0.01%
15 Exelon Corp.	39.0%	\$64,125	\$25,009	35.5%	\$81,000	\$28,755	2.8%	\$65.0	\$45.0	\$55.0	1.849	995.00	1000.00	0.10%
16 IDACORP, Inc.	56.1%	\$5,001	\$2,806	50.0%	\$7,100	\$3,550	4.8%	\$135.0	\$100.0	\$117.5	1.780	50.56	53.00	0.95%
17 NorthWestern Corp.	51.8%	\$5,148	\$2,667	52.0%	\$6,100	\$3,172	3.5%	\$70.0	\$45.0	\$57.5	1.117	59.74	62.00	0.75%
18 OGE Energy Corp.	52.4%	\$8,962	\$4,696	50.0%	\$10,400	\$5,200	2.1%	\$50.0	\$35.0	\$42.5	1.635	200.20	200.20	0.00%
19 Otter Tail Corp.	58.3%	\$2,041	\$1,190	57.5%	\$2,525	\$1,452	4.1%	\$75.0	\$55.0	\$65.0	1.898	41.63	42.50	0.41%
20 Pinnacle West Capital	43.9%	\$13,790	\$6,054	44.0%	\$16,900	\$7,436	4.2%	\$105.0	\$70.0	\$87.5	1.411	113.17	120.00	1.18%
21 PNM Resources	36.0%	\$6,096	\$2,195	37.0%	\$7,725	\$2,858	5.4%	\$60.0	\$40.0	\$50.0	1.565	85.83	90.00	0.95%
22 Sempra Energy	50.7%	\$51,683	\$26,203	52.0%	\$68,900	\$35,828	6.5%	\$115.0	\$85.0	\$100.0	1.818	628.67	650.00	0.67%
23 Southern Company	36.0%	\$83,500	\$30,060	37.0%	\$93,500	\$34,595	2.9%	\$100.0	\$70.0	\$85.0	2.636	1070.00	1070.00	0.00%

- (a) The Value Line Investment Survey (Dec. 8, 2023; Jan. 19 and Feb. 9, 2024).
(b) "b" is the retention ratio, computed as (EPS-DPS)/EPS.
(c) "r" is the rate of return on book equity, computed as EPS/BVPS.
(d) Computed using the formula $2 * (1 + 5\text{-Yr. Change in Equity}) / (2 + 5\text{ Yr. Change in Equity})$.
(e) Product of average year-end "r" for 2027 and Adjustment Factor.
(f) Product of change in common shares outstanding and M/B Ratio.
(g) Computed as $1 - \text{B/M Ratio}$.
(h) Product of total capital and equity ratio.
(i) Five-year rate of change.
(j) Average of High and Low expected market prices divided by 2027 BVPS.

CAPM MODEL - UTILITY GROUP

Case No.: U-21555
Exhibit: A-48 (JST-6)
Witness: John S. Thompson
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UTILITY GROUP

	(a)	(b)	(c)	(d)	(e)	(f)				
	Market Return (R_m)									
Company	Div Yield	Proj. Growth	Cost of Equity	Risk-Free Rate	Risk Premium	Beta	Unadjusted K_e	Market Cap	Size Adjustment	CAPM Result
1 Algonquin Pwr & Util	1.9%	10.1%	12.0%	4.5%	7.5%	1.00	12.0%	\$4,173	0.95%	13.0%
2 ALLETE	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$3,200	0.95%	12.6%
3 Avangrid, Inc.	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$11,900	0.61%	12.2%
4 Avista Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$2,800	1.21%	12.8%
5 Black Hills Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	1.00	12.0%	\$3,800	0.95%	13.0%
6 CenterPoint Energy	1.9%	10.1%	12.0%	4.5%	7.5%	1.15	13.1%	\$17,600	0.46%	13.6%
7 CMS Energy Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	0.85	10.9%	\$16,700	0.46%	11.3%
8 Dominion Energy	1.9%	10.1%	12.0%	4.5%	7.5%	0.90	11.3%	\$38,000	-0.06%	11.2%
9 DTE Energy Co.	1.9%	10.1%	12.0%	4.5%	7.5%	1.00	12.0%	\$21,600	0.46%	12.5%
10 Duke Energy Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	0.90	11.3%	\$73,800	-0.06%	11.2%
11 Edison International	1.9%	10.1%	12.0%	4.5%	7.5%	1.00	12.0%	\$28,100	0.46%	12.5%
12 Emera Inc.	1.9%	10.1%	12.0%	4.5%	7.5%	0.75	10.1%	\$13,200	0.61%	10.7%
13 Entergy Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$21,500	0.46%	12.1%
14 Evergy Inc.	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$11,700	0.61%	12.2%
15 Exelon Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	n/a	n/a	\$35,100	0.46%	n/a
16 IDACORP, Inc.	1.9%	10.1%	12.0%	4.5%	7.5%	0.85	10.9%	\$5,000	0.64%	11.5%
17 NorthWestern Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$3,100	0.95%	12.6%
18 OGE Energy Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	1.05	12.4%	\$7,000	0.64%	13.0%
19 Otter Tail Corp.	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$3,100	0.95%	12.6%
20 Pinnacle West Capital	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$8,400	0.61%	12.2%
21 PNM Resources	1.9%	10.1%	12.0%	4.5%	7.5%	0.90	11.3%	\$3,400	0.95%	12.2%
22 Sempra Energy	1.9%	10.1%	12.0%	4.5%	7.5%	1.00	12.0%	\$48,400	-0.06%	11.9%
23 Southern Company	1.9%	10.1%	12.0%	4.5%	7.5%	0.95	11.6%	\$75,500	-0.06%	11.6%
Average (g)							11.6%			12.2%

- (a) Weighted average for dividend-paying stocks in the S&P 500 based on data from www.valueline.com (retrieved Feb. 15, 2024).
(b) Average of weighted average earnings growth rates from IBES, Value Line, and Zacks for dividend-paying stocks in the S&P 500 based on data from Refinitiv, as provided by fidelity.com (retrieved Feb. 15, 2023), www.valueline.com (retrieved Feb. 15, 2024), and www.zacks.com (retrieved Feb. 15, 2024). Eliminated growth rates that were greater than 20%, as well as all negative values.
(c) Average yield on 30-year Treasury bonds for six-months ending Jan. 2024 based on data from <https://fred.stlouisfed.org/>.
(d) The Value Line Investment Survey, Summary & Index (Feb. 9, 2024).
(e) The Value Line Investment Survey (Dec. 8, 2023; Jan. 19 and Feb. 9, 2024).
(f) Kroll, 2023 CRSP Deciles Size Premium, Cost of Capital Navigator (2024).
(g) Excludes highlighted values.

UTILITY RISK PREMIUM

Case No.: U-21555
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COST OF EQUITY ESTIMATE

Current Equity Risk Premium

(a) Avg. Yield over Study Period	7.78%
(b) Average Utility Bond Yield	<u>5.85%</u>
Change in Bond Yield	-1.93%
(c) Risk Premium/Interest Rate Relationship	<u>-0.4240</u>
Adjustment to Average Risk Premium	0.82%
(a) Average Risk Premium over Study Period	<u>3.89%</u>
Adjusted Risk Premium	4.71%

Implied Cost of Equity

(b) Baa Utility Bond Yield	6.08%
Adjusted Equity Risk Premium	<u>4.71%</u>
Risk Premium Cost of Equity	10.79%

- (a) A-49 (JST-7), page 2.
- (b) Average bond yield on all utility bonds and 'Baa' subset for six-months ending Jan. 2024 based on data from Moody's Investors Service at www.credittrends.com.
- (c) A-49 (JST-7), page 3.

UTILITY RISK PREMIUM

Case No.: U-21555
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AUTHORIZED RETURNS

	(a)	(b)	
Year	Allowed ROE	Average Utility Bond Yield	Risk Premium
1974	13.10%	9.27%	3.83%
1975	13.20%	9.88%	3.32%
1976	13.10%	9.17%	3.93%
1977	13.30%	8.58%	4.72%
1978	13.20%	9.22%	3.98%
1979	13.50%	10.39%	3.11%
1980	14.23%	13.15%	1.08%
1981	15.22%	15.62%	-0.40%
1982	15.78%	15.33%	0.45%
1983	15.36%	13.31%	2.05%
1984	15.32%	14.03%	1.29%
1985	15.20%	12.29%	2.91%
1986	13.93%	9.46%	4.47%
1987	12.99%	9.98%	3.01%
1988	12.79%	10.45%	2.34%
1989	12.97%	9.66%	3.31%
1990	12.70%	9.76%	2.94%
1991	12.54%	9.21%	3.33%
1992	12.09%	8.57%	3.52%
1993	11.46%	7.56%	3.90%
1994	11.21%	8.30%	2.91%
1995	11.58%	7.91%	3.67%
1996	11.40%	7.74%	3.66%
1997	11.33%	7.63%	3.70%
1998	11.77%	7.00%	4.77%

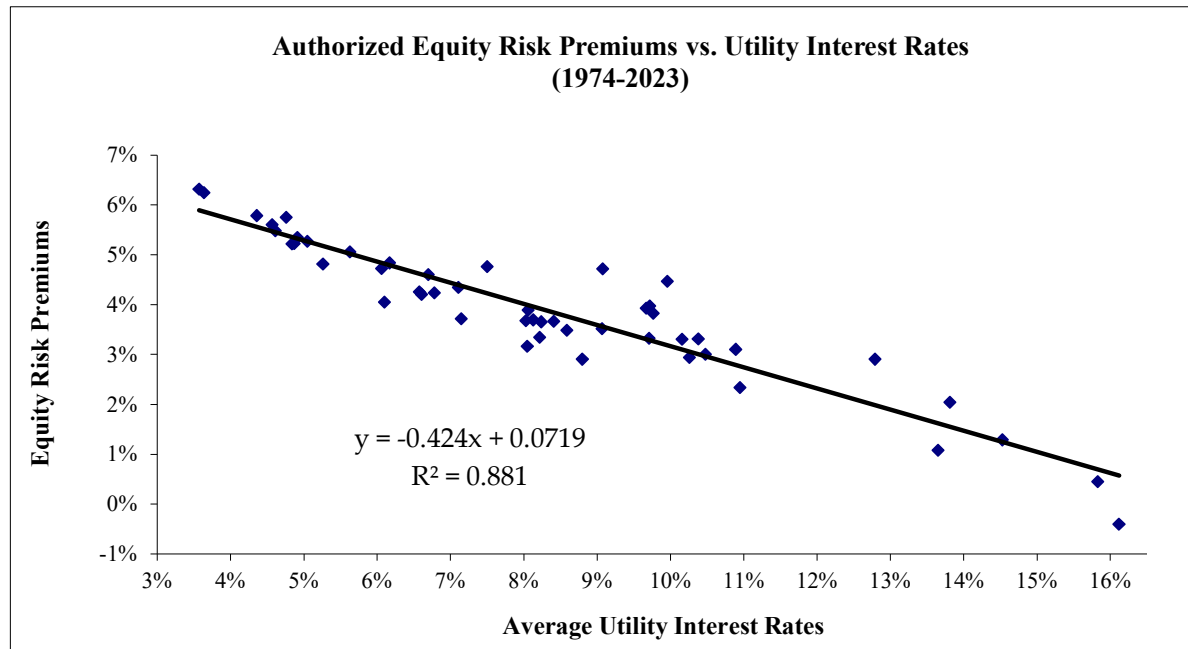
	(a)	(b)	
Year	Allowed ROE	Average Utility Bond Yield	Risk Premium
1999	10.72%	7.55%	3.17%
2000	11.58%	8.09%	3.49%
2001	11.07%	7.72%	3.35%
2002	11.21%	7.53%	3.68%
2003	10.96%	6.61%	4.35%
2004	10.81%	6.20%	4.61%
2005	10.51%	5.67%	4.84%
2006	10.34%	6.08%	4.26%
2007	10.32%	6.11%	4.21%
2008	10.37%	6.65%	3.72%
2009	10.52%	6.28%	4.24%
2010	10.29%	5.56%	4.73%
2011	10.19%	5.13%	5.06%
2012	10.02%	4.26%	5.76%
2013	9.82%	4.55%	5.27%
2014	9.76%	4.41%	5.35%
2015	9.60%	4.37%	5.23%
2016	9.60%	4.11%	5.49%
2017	9.68%	4.07%	5.61%
2018	9.56%	4.34%	5.22%
2019	9.65%	3.86%	5.79%
2020	9.39%	3.07%	6.32%
2021	9.39%	3.14%	6.25%
2022	9.58%	4.76%	4.82%
2023	<u>9.66%</u>	<u>5.60%</u>	<u>4.06%</u>
Average	11.68%	7.78%	3.89%

- (a) S&P Global Market Intelligence, *Major Rate Case Decisions*, RRA Regulatory Focus; *UtilityScope Regulatory Service*, Argus. Data for "general" rate cases (excluding limited-issue rider cases) beginning in 2006 (the first year such data presented by RRA).
- (b) Moody's Investors Service.

UTILITY RISK PREMIUM

Case No.: U-21555
Exhibit: A-49 (JST-7)
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REGRESSION RESULTS



EXPECTED EARNINGS BENCHMARK**Case No.: U-21555****Exhibit: A-50 (JST-8)****Witness: John S. Thompson****Page: 1 of 1****UTILITY GROUP**

	(a)	(b)	(c)
Company	Expected Return on Common Equity	Adjustment Factor	Adjusted Return on Common Equity
1 Algonquin Pwr & Util	n/a	n/a	n/a
2 ALLETE	9.0%	1.0217	9.2%
3 Avangrid, Inc.	5.0%	1.0058	5.0%
4 Avista Corp.	7.5%	1.0333	7.7%
5 Black Hills Corp.	8.0%	1.0257	8.2%
6 CenterPoint Energy	10.0%	1.0387	10.4%
7 CMS Energy Corp.	13.5%	1.0198	13.8%
8 Dominion Energy	10.0%	1.0199	10.2%
9 DTE Energy Co.	12.5%	1.0299	12.9%
10 Duke Energy Corp.	9.0%	1.0045	9.0%
11 Edison International	14.0%	1.0178	14.2%
12 Emera Inc.	11.5%	1.0181	11.7%
13 Entergy Corp.	10.0%	1.0293	10.3%
14 Evergy Inc.	10.0%	1.0142	10.1%
15 Exelon Corp.	10.0%	1.0140	10.1%
16 IDACORP, Inc.	9.5%	1.0235	9.7%
17 NorthWestern Corp.	8.0%	1.0173	8.1%
18 OGE Energy Corp.	13.0%	1.0102	13.1%
19 Otter Tail Corp.	11.5%	1.0199	11.7%
20 Pinnacle West Capital	9.5%	1.0206	9.7%
21 PNM Resources	10.5%	1.0264	10.8%
22 Semptra Energy	11.0%	1.0313	11.3%
23 Southern Company	14.5%	1.0141	14.7%
Average (d)	10.8%		10.8%

(a) The Value Line Investment Survey (Dec. 8, 2023; Jan. 19 and Feb. 9, 2024).

(b) Adjustment to convert year-end return to an average rate of return from A-47 (JST-5).

(c) (a) x (b).

(d) Excludes highlighted values.

DCF MODEL - NON-UTILITY GROUP

Case No.: U-21555
 Exhibit: A-51 (JST-9)
 Witness: John S. Thompson
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DIVIDEND YIELD

			(a)	(b)	
	Company	Industry Group	Price	Dividends	Yield
1	Abbott Labs.	Med Supp Non-Invasive	\$112.61	\$ 2.20	2.0%
2	Air Products & Chem.	Chemical (Diversified)	\$256.75	\$ 7.00	2.7%
3	Amdocs Ltd.	IT Services	\$90.75	\$ 1.74	1.9%
4	Amgen	Biotechnology	\$306.35	\$ 9.00	2.9%
5	Apple Inc.	Computers/Peripherals	\$188.15	\$ 0.96	0.5%
6	Becton, Dickinson	Med Supp Invasive	\$238.84	\$ 3.85	1.6%
7	Bristol-Myers Squibb	Drug	\$50.18	\$ 2.40	4.8%
8	Brown & Brown	Financial Svcs. (Div.)	\$75.16	\$ 0.52	0.7%
9	Brown-Forman 'B'	Beverage	\$55.84	\$ 0.87	1.6%
10	Church & Dwight	Household Products	\$97.72	\$ 1.09	1.1%
11	Cisco Systems	Telecom. Equipment	\$50.67	\$ 1.56	3.1%
12	Coca-Cola	Beverage	\$59.81	\$ 1.96	3.3%
13	Colgate-Palmolive	Household Products	\$81.81	\$ 1.95	2.4%
14	Comcast Corp.	Cable TV	\$43.94	\$ 1.24	2.8%
15	Costco Wholesale	Retail Store	\$685.19	\$ 4.38	0.6%
16	Gallagher (Arthur J.)	Financial Svcs. (Div.)	\$232.35	\$ 2.40	1.0%
17	Gen'l Mills	Food Processing	\$64.28	\$ 2.42	3.8%
18	Gilead Sciences	Drug	\$81.12	\$ 3.00	3.7%
19	Hershey Co.	Food Processing	\$192.17	\$ 4.93	2.6%
20	Home Depot	Retail Building Supply	\$353.38	\$ 8.36	2.4%
21	Hormel Foods	Food Processing	\$31.07	\$ 1.16	3.7%
22	Intercontinental Exch.	Brokers & Exchanges	\$127.71	\$ 1.68	1.3%
23	Johnson & Johnson	Med Supp Non-Invasive	\$159.52	\$ 4.94	3.1%
24	Kimberly-Clark	Household Products	\$122.05	\$ 4.88	4.0%
25	Lilly (Eli)	Drug	\$643.99	\$ 5.20	0.8%
26	Lockheed Martin	Aerospace/Defense	\$444.01	\$ 12.60	2.8%
27	Marsh & McLennan	Financial Svcs. (Div.)	\$193.94	\$ 2.88	1.5%
28	McCormick & Co.	Food Processing	\$67.00	\$ 1.68	2.5%
29	McDonald's Corp.	Restaurant	\$293.62	\$ 6.83	2.3%
30	McKesson Corp.	Med Supp Non-Invasive	\$487.79	\$ 2.56	0.5%
31	Merck & Co.	Drug	\$119.80	\$ 3.08	2.6%
32	Microsoft Corp.	Computer Software	\$393.49	\$ 2.08	0.5%
33	Mondelez Int'l	Food Processing	\$74.05	\$ 1.70	2.3%
34	NewMarket Corp.	Chemical (Specialty)	\$572.23	\$ 9.00	1.6%
35	Northrop Grumman	Aerospace/Defense	\$460.93	\$ 7.84	1.7%
36	Oracle Corp.	Computer Software	\$109.92	\$ 1.60	1.5%
37	PepsiCo, Inc.	Beverage	\$168.82	\$ 5.20	3.1%
38	Procter & Gamble	Household Products	\$152.52	\$ 3.76	2.5%
39	Progressive Corp.	Insurance (Prop/Cas.)	\$172.10	\$ 0.40	0.2%
40	Republic Services	Environmental	\$168.62	\$ 2.14	1.3%
41	Roper Tech.	Machinery	\$542.11	\$ 3.00	0.6%
42	Sherwin-Williams	Retail Building Supply	\$304.35	\$ 2.55	0.8%
43	Smucker (J.M.)	Food Processing	\$129.99	\$ 4.32	3.3%
44	Texas Instruments	Semiconductor	\$165.53	\$ 5.20	3.1%
45	Thermo Fisher Sci.	Precision Instrument	\$545.45	\$ 1.40	0.3%
46	Travelers Cos.	Insurance (Prop/Cas.)	\$203.69	\$ 4.00	2.0%
47	UnitedHealth Group	Medical Services	\$520.01	\$ 7.52	1.4%
48	Walmart Inc.	Retail Store	\$163.04	\$ 2.32	1.4%
49	Waste Management	Environmental	\$183.47	\$ 2.80	1.5%
	Average				2.0%

- (a) Average of closing prices for 30 trading days ended Feb. 9, 2024.
 (b) The Value Line Investment Survey, *Summary & Index* (Feb. 9, 2024).

DCF MODEL - NON-UTILITY GROUP

Case No.: U-21555
 Exhibit: A-51 (JST-9)
 Witness: John S. Thompson
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GROWTH RATES

	(a)	(b)	(c)
	Earnings Growth		
Company	V Line	IBES	Zacks
1 Abbott Labs.	4.00%	7.80%	9.00%
2 Air Products & Chem.	10.50%	6.69%	7.34%
3 Amdocs Ltd.	7.50%	8.60%	10.50%
4 Amgen	5.50%	5.57%	5.43%
5 Apple Inc.	8.50%	11.00%	12.67%
6 Becton, Dickinson	5.50%	8.65%	9.35%
7 Bristol-Myers Squibb	n/a	-2.63%	5.00%
8 Brown & Brown	6.50%	11.90%	8.81%
9 Brown-Forman 'B'	16.50%	11.00%	n/a
10 Church & Dwight	6.00%	9.10%	8.45%
11 Cisco Systems	6.50%	6.41%	6.20%
12 Coca-Cola	8.00%	6.34%	6.36%
13 Colgate-Palmolive	8.50%	8.38%	6.54%
14 Comcast Corp.	9.00%	9.78%	10.46%
15 Costco Wholesale	10.50%	9.11%	9.05%
16 Gallagher (Arthur J.)	22.00%	13.20%	10.75%
17 Gen'l Mills	5.50%	7.21%	6.37%
18 Gilead Sciences	13.50%	5.13%	10.85%
19 Hershey Co.	9.50%	5.84%	6.80%
20 Home Depot	6.50%	2.70%	8.94%
21 Hormel Foods	7.50%	8.20%	4.69%
22 Intercontinental Exch.	7.00%	7.79%	9.39%
23 Johnson & Johnson	4.50%	4.70%	5.59%
24 Kimberly-Clark	6.00%	5.05%	4.66%
25 Lilly (Eli)	19.00%	52.03%	36.25%
26 Lockheed Martin	7.00%	6.83%	4.18%
27 Marsh & McLennan	9.00%	6.50%	6.53%
28 McCormick & Co.	4.50%	6.70%	6.61%
29 McDonald's Corp.	10.50%	7.41%	7.48%
30 McKesson Corp.	8.00%	10.61%	10.83%
31 Merck & Co.	8.50%	67.41%	9.00%
32 Microsoft Corp.	10.50%	16.30%	16.16%
33 Mondelez Int'l	11.00%	8.70%	8.35%
34 NewMarket Corp.	0.50%	7.70%	n/a
35 Northrop Grumman	8.50%	29.91%	3.05%
36 Oracle Corp.	10.00%	10.67%	11.75%
37 PepsiCo, Inc.	7.50%	6.96%	8.21%
38 Procter & Gamble	6.00%	8.03%	7.60%
39 Progressive Corp.	12.00%	26.00%	20.75%
40 Republic Services	12.50%	8.89%	10.10%
41 Roper Tech.	8.00%	7.70%	10.50%
42 Sherwin-Williams	11.00%	11.37%	11.81%
43 Smucker (J.M.)	5.50%	6.53%	6.30%
44 Texas Instruments	3.50%	10.00%	9.00%
45 Thermo Fisher Sci.	6.50%	6.74%	11.06%
46 Travelers Cos.	7.50%	16.20%	11.52%
47 UnitedHealth Group	13.00%	12.66%	13.21%
48 Walmart Inc.	6.50%	8.32%	7.32%
49 Waste Management	6.50%	10.00%	10.19%

- (a) The Value Line Investment Survey (various editions as of Feb. 9, 2024).
 (b) www.finance.yahoo.com (retrieved Feb. 13, 2024).
 (c) www.zacks.com (retrieved Feb. 13, 2024).

DCF COST OF EQUITY ESTIMATES

	(a)	(b)		(c)
		Earnings Growth		
Company	V Line	IBES	Zacks	
1 Abbott Labs.	6.0%	9.8%	11.0%	
2 Air Products & Chem.	13.2%	9.4%	10.1%	
3 Amdocs Ltd.	9.4%	10.5%	12.4%	
4 Amgen	8.4%	8.5%	8.4%	
5 Apple Inc.	9.0%	11.5%	13.2%	
6 Becton, Dickinson	7.1%	10.3%	11.0%	
7 Bristol-Myers Squibb	n/a	2.2%	9.8%	
8 Brown & Brown	7.2%	12.6%	9.5%	
9 Brown-Forman 'B'	18.1%	12.6%	n/a	
10 Church & Dwight	7.1%	10.2%	9.6%	
11 Cisco Systems	9.6%	9.5%	9.3%	
12 Coca-Cola	11.3%	9.6%	9.6%	
13 Colgate-Palmolive	10.9%	10.8%	8.9%	
14 Comcast Corp.	11.8%	12.6%	13.3%	
15 Costco Wholesale	11.1%	9.7%	9.7%	
16 Gallagher (Arthur J.)	23.0%	14.2%	11.8%	
17 Gen'l Mills	9.3%	11.0%	10.1%	
18 Gilead Sciences	17.2%	8.8%	14.5%	
19 Hershey Co.	12.1%	8.4%	9.4%	
20 Home Depot	8.9%	5.1%	11.3%	
21 Hormel Foods	11.2%	11.9%	8.4%	
22 Intercontinental Exch.	8.3%	9.1%	10.7%	
23 Johnson & Johnson	7.6%	7.8%	8.7%	
24 Kimberly-Clark	10.0%	9.0%	8.7%	
25 Lilly (Eli)	19.8%	52.8%	37.1%	
26 Lockheed Martin	9.8%	9.7%	7.0%	
27 Marsh & McLennan	10.5%	8.0%	8.0%	
28 McCormick & Co.	7.0%	9.2%	9.1%	
29 McDonald's Corp.	12.8%	9.7%	9.8%	
30 McKesson Corp.	8.5%	11.1%	11.4%	
31 Merck & Co.	11.1%	70.0%	11.6%	
32 Microsoft Corp.	11.0%	16.8%	16.7%	
33 Mondelez Int'l	13.3%	11.0%	10.6%	
34 NewMarket Corp.	2.1%	9.3%	n/a	
35 Northrop Grumman	10.2%	31.6%	4.8%	
36 Oracle Corp.	11.5%	12.1%	13.2%	
37 PepsiCo, Inc.	10.6%	10.0%	11.3%	
38 Procter & Gamble	8.5%	10.5%	10.1%	
39 Progressive Corp.	12.2%	26.2%	21.0%	
40 Republic Services	13.8%	10.2%	11.4%	
41 Roper Tech.	8.6%	8.3%	11.1%	
42 Sherwin-Williams	11.8%	12.2%	12.6%	
43 Smucker (J.M.)	8.8%	9.9%	9.6%	
44 Texas Instruments	6.6%	13.1%	12.1%	
45 Thermo Fisher Sci.	6.8%	7.0%	11.3%	
46 Travelers Cos.	9.5%	18.2%	13.5%	
47 UnitedHealth Group	14.4%	14.1%	14.7%	
48 Walmart Inc.	7.9%	9.7%	8.7%	
49 Waste Management	8.0%	11.5%	11.7%	
Average (b)	10.4%	10.4%	10.7%	

(a) Sum of dividend yield (p. 1) and respective growth rate (p. 2).

(b) Excludes highlighted figures.

CAPITAL STRUCTURE

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UTILITY GROUP

	Company	At Year-end 2022 (a)			Value Line Projected (b)		
		Debt	Preferred	Common Equity	Debt	Preferred	Common Equity
1	Algonquin Pwr & Util	52.4%	1.3%	46.4%	n/a	n/a	n/a
2	ALLETE	36.5%	0.0%	63.5%	40.5%	0.0%	59.5%
3	Avangrid, Inc.	29.8%	0.0%	70.2%	43.0%	0.0%	57.0%
4	Avista Corp.	49.6%	0.0%	50.4%	47.0%	0.0%	53.0%
5	Black Hills Corp.	57.2%	0.0%	42.8%	54.0%	0.0%	46.0%
6	CenterPoint Energy	61.9%	3.0%	35.1%	57.5%	0.0%	42.5%
7	CMS Energy Corp.	65.2%	1.0%	33.8%	63.5%	1.0%	35.5%
8	Dominion Energy	60.2%	2.5%	37.2%	53.5%	2.5%	44.0%
9	DTE Energy Co.	63.4%	0.0%	36.6%	61.0%	0.0%	39.0%
10	Duke Energy Corp.	57.9%	1.6%	40.5%	61.0%	1.5%	37.5%
11	Edison International	62.8%	4.2%	33.0%	66.5%	6.5%	27.0%
12	Emera Inc.	58.8%	5.1%	36.1%	57.8%	0.0%	42.2%
13	Entergy Corp.	66.1%	0.6%	33.3%	64.5%	0.0%	35.5%
14	Evergy Inc.	52.1%	0.0%	47.9%	53.5%	0.0%	46.5%
15	Exelon Corp.	60.0%	0.0%	40.0%	64.5%	0.0%	35.5%
16	IDACORP, Inc.	43.8%	0.0%	56.2%	50.0%	0.0%	50.0%
17	NorthWestern Corp.	48.3%	0.0%	51.7%	48.0%	0.0%	52.0%
18	OGE Energy Corp.	50.8%	0.0%	49.2%	50.0%	0.0%	50.0%
19	Otter Tail Corp.	40.4%	0.0%	59.6%	42.5%	0.0%	57.5%
20	Pinnacle West Capital	55.8%	0.0%	44.2%	56.0%	0.0%	44.0%
21	PNM Resources	64.4%	0.2%	35.4%	62.5%	0.5%	37.0%
22	Sempra Energy	44.9%	1.6%	53.5%	46.5%	1.5%	52.0%
23	Southern Company	61.4%	0.0%	38.6%	63.0%	0.0%	37.0%
Minimum		29.8%	0.0%	33.0%	40.5%	0.0%	27.0%
Maximum		66.1%	5.1%	70.2%	66.5%	6.5%	59.5%
Average		54.1%	0.9%	45.0%	54.8%	0.6%	44.6%

(a) 2022 SEC Form 10-K reports.

(b) The Value Line Investment Survey (Dec. 8, 2023; Jan. 19 and Feb. 9, 2024).

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UTILITY GROUP OPERATING SUBSIDIARIES

		At Year-End 2022 (a)		
	Operating Company	Debt	Preferred	Common Equity
1	ALGONQUIN PWR. & UTIL.			
	Empire District Electric Co.	41.4%	0.0%	58.6%
	Liberty Utilities (Granite State Elec.)	19.6%	0.0%	80.4%
2	ALLETE			
	ALLETE, Inc. (Minnesota Power)	40.3%	0.0%	59.7%
3	AVANGRID			
	Central Maine Pwr	37.4%	0.0%	62.6%
	NY State E&G	49.2%	0.0%	50.8%
	Rochester G&E	50.0%	0.0%	50.0%
	United Illuminating	41.0%	0.0%	59.0%
4	AVISTA CORP.			
	Avista Corp.	49.3%	0.0%	50.7%
	Alaska Electric Light & Power	39.1%	0.0%	60.9%
5	BLACK HILLS CORP.			
	Black Hills Power	49.9%	0.0%	50.1%
	Cheyenne Light Fuel & Power	57.2%	0.0%	42.8%
	Black Hills/Colorado Electric Utility Co	52.1%	0.0%	47.9%
6	CENTERPOINT ENERGY			
	Centerpoint Energy Houston Electric	56.0%	0.0%	44.0%
7	CMS ENERGY			
	Consumers Energy Co.	50.2%	0.2%	49.6%
8	DOMINION ENERGY			
	Virginia Electric & Power	48.4%	0.0%	51.6%
	Dominion Energy South Carolina	45.2%	0.0%	54.8%
9	DTE ENERGY CO.			
	DTE Electric Co.	50.0%	0.0%	50.0%
10	DUKE ENERGY			
	Duke Energy Carolinas	48.0%	0.0%	52.0%
	Duke Energy Florida	51.8%	0.0%	48.2%
	Duke Energy Indiana	47.8%	0.0%	52.2%
	Duke Energy Ohio	40.5%	0.0%	59.5%
	Duke Energy Progress	51.8%	0.0%	48.2%
	Duke Energy Kentucky	47.0%	0.0%	53.0%
11	EDISON INTERNATIONAL			
	Southern California Edison Co.	55.8%	4.1%	40.1%
12	EMERA INC.			
	Tampa Electric Co.	41.9%	0.0%	58.1%
13	ENTERGY CORP.			
	Entergy Arkansas Inc.	52.4%	0.0%	47.6%
	Entergy Louisiana LLC	53.0%	0.0%	47.0%
	Entergy Mississippi Inc.	53.3%	0.0%	46.7%
	Entergy New Orleans Inc.	52.4%	0.0%	47.6%
	Entergy Texas Inc.	51.9%	0.7%	47.4%

CAPITAL STRUCTURE

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UTILITY GROUP OPERATING SUBSIDIARIES

Operating Company	At Year-End 2022 (a)		
	Debt	Preferred	Common Equity
14 EVERGY, INC.			
Evergy Metro	47.9%	0.0%	52.1%
Evergy Kansas Central	46.6%	0.0%	53.4%
15 EXELON CORP.			
Delmarva Power and Light	49.8%	0.0%	50.2%
Baltimore Gas & Electric Co.	46.0%	0.0%	54.0%
Commonwealth Edison Co.	44.5%	0.0%	55.5%
PECO Energy Co.	46.3%	0.0%	53.7%
Potomac Electric Power Co.	49.8%	0.0%	50.2%
Atlantic City Electric Co.	50.1%	0.0%	49.9%
16 IDACORP			
Idaho Power Co.	45.5%	0.0%	54.5%
17 NORTHWESTERN CORP.			
NorthWestern Corporation	49.7%	0.0%	50.3%
18 OGE ENERGY CORP.			
Oklahoma G&E	44.2%	0.0%	55.8%
19 OTTER TAIL CORP.			
Otter Tail Power Co.	45.1%	0.0%	54.9%
20 PINNACLE WEST CAPITAL			
Arizona Public Service Co.	49.1%	0.0%	50.9%
21 PNM RESOURCES			
Public Service Company of New Mexico	50.4%	0.3%	49.3%
Texas-New Mexico Power Co.	49.4%	0.0%	50.6%
22 SEMPRA ENERGY			
San Diego Gas & Electric	49.8%	0.0%	50.2%
Oncor Electric Delivery	43.3%	0.0%	56.7%
23 SOUTHERN CO.			
Alabama Power Co.	47.6%	0.0%	52.4%
Georgia Power Co.	44.2%	0.0%	55.8%
Mississippi Power Co.	44.4%	0.0%	55.6%
Minimum	19.6%	0.0%	40.1%
Maximum	57.2%	4.1%	80.4%
Average	47.4%	0.1%	52.5%

(a) Data from SEC Form 10-K Reports and FERC Form 1 Reports.

EXHIBIT A-53 (KLR-1)
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