

MONTANA-DAKOTA UTILITIES CO.  
BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION  
CASE NO. PU-20-379  
PREPARED REBUTTAL TESTIMONY OF  
ANN E. BULKLEY

1       **I. INTRODUCTION AND PURPOSE**

2       **Q1. Please state your name, occupation and business address.**

3       A1. My name is Ann E. Bulkley. I am employed by Concentric Energy Advisors, Inc.  
4       ("Concentric") as a Senior Vice President. My business address is 293 Boston Post  
5       Road West, Suite 500, Marlborough, Massachusetts 01752.

6       **Q2. On whose behalf are you submitting this Prepared Rebuttal Testimony?**

7       A2. I am submitting this Prepared Rebuttal Testimony before the North Dakota Public  
8       Service Commission ("Commission") on behalf of Montana-Dakota Utilities Co.  
9       ("Montana-Dakota" or the "Company"), which is an indirect wholly-owned  
10       subsidiary of MDU Resources Group, Inc. ("MDU Resources").

11       **Q3. Did you previously submit testimony in this proceeding?**

12       A3. Yes. I submitted Prepared Direct Testimony regarding the appropriate Return on  
13       Equity ("ROE") and capital structure for Montana-Dakota in this proceeding.

14       **Q4. What is the purpose of your Prepared Rebuttal Testimony?**

15       A4. The purpose of my Prepared Rebuttal Testimony is to respond to the Direct  
16       Testimony of Mr. Aaron L. Rothschild on behalf of the North Dakota Public  
17       Service Commission Advocacy Staff Office ("Staff") as this testimony relates to

1 the just and reasonable ROE and the appropriate capital structure for Montana-  
2 Dakota.

3 **Q5. Please briefly summarize your key conclusions and recommendations**  
4 **regarding the appropriate ROE and capital structure for Montana-Dakota.**

5 A5. My key conclusions and recommendations are as follows:

- 6 • An authorized ROE of 8.09 percent as recommended by Staff witness  
7 Rothschild would place the return for Montana-Dakota well below the  
8 lowest authorized return for a natural gas distribution company in the U.S.  
9 since 2018. A return this low would not satisfy the comparable return  
10 standard of *Hope* and *Bluefield*, would likely be viewed as credit negative  
11 by the rating agencies and could affect Montana-Dakota's ability to attract  
12 capital when competing with other subsidiaries of MDU Resources for  
13 discretionary investment capital.
- 14 • Mr. Rothschild's recommendation is especially low given the evidence  
15 regarding Montana-Dakota's business and financial risks in North Dakota.  
16 Montana-Dakota has above average risk relative to the proxy group  
17 companies, as discussed in my Prepared Direct Testimony, and investors  
18 should be compensated for that risk through a higher than average return.
- 19 • Mr. Rothschild develops his recommended range by averaging the low and  
20 the high CAPM and DCF results. His DCF results range from 9.48 percent  
21 to 11.45 percent while his CAPM results range from 6.61 percent to 7.80  
22 percent. Mr. Rothschild does not seem to consider the wide disparity in the

1 results of these models. The range on his CAPM model, which follows a  
2 non-traditional methodology is approximately 290 basis points below the  
3 low end and 365 basis points below the high end of his DCF results.  
4 Averaging his unreasonably low CAPM results with the DCF results are the  
5 primary driver of his low ROE recommendation.

- 6 • Two of his three inputs to the CAPM (i.e., Beta and Market Risk Premium)  
7 are calculated using options contract data. The use of option contracts is  
8 problematic for a number of reasons including: 1) the results are very  
9 dependent on the day selected; 2) in the case of Beta, the type of options  
10 data needed (i.e., options contracts with expiration dates greater than six  
11 months) to estimate the cost of capital is not available; and 3) the method  
12 that Mr. Rothschild has applied to calculate the option-implied market  
13 return changed from a prior rate case where Mr. Rothschild has testified.  
14 The cumulative effect of all these factors is options contract data leads to  
15 volatile CAPM results. Volatile results are especially problematic in this  
16 case since we are trying to estimate the cost of equity for Montana-Dakota  
17 over a forward-looking period that the Company's rates will be in effect. It  
18 is not possible to assume the results of Mr. Rothschild's CAPM which are  
19 volatile will be reflective of the cost of equity for Montana-Dakota over the  
20 near-term.
- 21 • Reasonable adjustment can be applied to Mr. Rothchild's DCF and CAPM  
22 model which result in an ROE range that is more consistent with the  
23 authorized returns of other risk-comparable natural gas utilities. For

1           example, I adjusted Mr. Rothschild's DCF model to rely on earnings growth  
2           rates and his CAPM to rely on my estimate of the market return instead of  
3           Mr. Rothschild's option-implied market return. The adjustments produce a  
4           recommended ROE range based on the low and high DCF and CAPM  
5           results of 9.93 percent to 10.64 percent.

6           • Updated market-based data for my proxy group companies as of December  
7           31, 2020 continues to support my recommended ROE range for Montana-  
8           Dakota of 9.75 percent and 10.25 percent.

9           • Mr. Rothschild inappropriately adjusts his ROE recommendation  
10          downward 16 basis points to reflect what he perceives to be a decrease in  
11          financial risk associated with the Company's proposed equity ratio as  
12          compared to the proxy group. However, Mr. Rothschild bases his  
13          conclusion on an analysis of the capital structures of his proxy group at the  
14          holding company level which includes corporate level debt that is not a part  
15          of the regulated capital structure. The more appropriate comparison is to  
16          examine the capital structures of the proxy group companies at the operating  
17          subsidiary level. If Mr. Rothschild had reviewed the capital structures of  
18          the proxy group companies at the operating subsidiary level, he would have  
19          concluded that the Company has greater financial risk relative to the proxy  
20          group and therefore his ROE recommendation should have been increased.

1                   The Commission should consider this additional risk when determining the  
2                   authorize ROE for Montana-Dakota.

3   **Q6. Have you prepared any exhibits to support your analysis and**  
4   **recommendations?**

5   A6. Yes. I am sponsoring Exhibit No. \_\_\_\_ (AEB-4), Schedules 1 through 10, which have  
6   been prepared by me or under my direction.

7   **Q7. How is the remainder of your Prepared Rebuttal Testimony organized?**

8   A7. The remainder of my Prepared Rebuttal Testimony is organized as follows:

- 9                   • In Section II, I provide an overview of Staff witness Rothchild's  
10                   recommendations, a comparison of those recommendations to the  
11                   comparable returns for natural gas utilities nationwide and to the results of  
12                   my updated analyses and recommendations<sup>1</sup>, and an assessment of key  
13                   factors in establishing the Company's ROE.
- 14                   • In Section III, I respond to Mr. Rothschild's testimony regarding capital  
15                   market conditions and their effect on the models used to estimate the cost  
16                   of equity for the Company.
- 17                   • In Section IV, I respond to Mr. Rothschild's testimony regarding the ROE  
18                   and capital structure for Montana-Dakota's natural gas operations in North  
19                   Dakota.
- 20                   • Finally, in Section V, I summarize my conclusions and recommendations.

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<sup>1</sup> I have updated my analyses and recommendations using market data as of December 31, 2020.

1 Please note, in the interest of brevity I do not directly address all elements of Mr.  
2 Rothschild's testimony. Silence should not be taken to mean that I necessarily  
3 agree with Mr. Rothschild.

4 **II. SUMMARY OF RECOMMENDATIONS AND COMPARABLE**  
5 **RETURN STANDARD**

6 **Q8. Please provide an overview of the Mr. Rothschild's recommendations in this**  
7 **proceeding.**

8 A8. Staff witness Rothschild recommends an ROE of 8.09 percent for Montana-Dakota.  
9 To develop this very specific recommendation, Mr. Rothschild averages his  
10 Discounted Cash Flow ("DCF") results and his Capital Asset Pricing Model  
11 ("CAPM") results to set the range of results, then relies on the midpoint of that  
12 range. Further, his recommendation includes a downward adjustment to his ROE  
13 estimate to "compensate" for the Company's requested 50.306 percent common  
14 equity ratio which he claims is higher than his proxy group average.<sup>2</sup> Mr.  
15 Rothschild supports the Company's requested capital structure and cost of debt.<sup>3</sup>  
16 Mr. Rothschild's recommendation results in an ROR for Montana-Dakota of 6.24  
17 percent.<sup>4</sup>

18 **Q9. Have you updated the ROE analyses you presented in your Direct Testimony?**

19 A9. Yes. As shown in Exhibit No. \_\_\_\_ (AEB-4), Schedules 1 through 8, I have updated  
20 my ROE analyses based on market data as of December 31, 2020. The

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<sup>2</sup> Direct Testimony of Aaron L. Rothschild ("Rothschild Direct"), at 3-4.

<sup>3</sup> *Id.*, at 4.

<sup>4</sup> *Ibid.*

1 methodologies in my updated analysis have been developed in a manner that is  
2 consistent with the approach I took in my Prepared Direct Testimony. I have  
3 continued to exclude results below 7.0 percent because such returns do not provide  
4 a sufficient risk premium above the long-term debt cost to compensate equity  
5 investors for the risks associated with ownership. I also included an additional  
6 CAPM and ECAPM analysis which relies on the long-term average utility Beta  
7 coefficient for the companies in my proxy group. Finally, based on the updated  
8 market data, I am relying on the median as opposed to the mean as the measure of  
9 central tendency for my updated Constant Growth DCF results to address outliers  
10 in the data set. Figure 1 summarizes the results of my updated analyses.

11 As shown in Figure 1, the results of my updated ROE analyses provide additional  
12 support for my ROE recommendation of 10.20 percent. The Company, however,  
13 has reduced its requested ROE to 9.80 percent, which is within the range established  
14 by the results of my ROE estimation models and the recently authorized returns in  
15 other jurisdictions, in an effort to mitigate the rate impact on customers in these  
16 difficult economic conditions. In addition, while the analytical results of ROE  
17 estimation models provide a starting point, my recommendation continues to  
18 appropriately consider the results of multiple methodologies as well as other

1 factors, including company-specific risks, capital market conditions and the capital  
 2 attraction and comparable return standards.

3 **Figure 1: Summary of Updated Cost of Equity Results**

<b>Constant Growth DCF</b>			
	Median Low	Median	Median High
Excluding NJR			
30-Day Average Price	8.67%	9.72%	11.40%
90-Day Average Price	8.84%	9.69%	11.41%
180-Day Average Price	9.59%	9.57%	11.11%
Including NJR			
30-Day Average Price	8.67%	9.68%	10.07%
90-Day Average Price	8.84%	9.62%	10.37%
180-Day Average Price	9.59%	9.45%	10.28%
<b>Capital Asset Pricing Model</b>			
	Current Risk-Free Rate (1.65%)	Q2 2021 – Q2 2022 Projected Risk-Free Rate (1.98%)	2022-2026 Projected Risk-Free Rate (2.80%)
Excluding NJR			
Value Line Beta	12.48%	12.52%	12.62%
Bloomberg Beta	11.60%	11.66%	11.82%
Including NJR			
Value Line Beta	12.61%	12.65%	12.74%
Bloomberg Beta	11.64%	11.70%	11.86%
<b>Capital Asset Pricing Model – Long-term Average Utility Beta</b>			
Long-term Avg. Beta	10.55%	10.64%	10.87%
<b>Empirical Capital Asset Pricing Model</b>			
Excluding NJR			
Value Line Beta	12.86%	12.89%	12.97%
Bloomberg Beta	12.20%	12.25%	12.37%
Including NJR			
Value Line Beta	12.96%	12.99%	13.06%
Bloomberg Beta	12.23%	12.28%	12.40%
<b>Empirical Capital Asset Pricing Model – Long-term Average Utility Beta</b>			
Long-term Avg. Beta	11.42%	11.49%	11.66%
<b>Bond Yield Plus Risk Premium</b>			
	Current Risk-Free Rate (1.65%)	Q2 2021 – Q2 2022 Projected Risk-Free Rate (1.98%)	2022-2026 Projected Risk-Free Rate (2.80%)
Risk Premium Results	9.22%	9.36%	9.70%
<b>Expected Earnings Analysis</b>			
	Mean	Median	
Excluding NJR	9.53%	9.12%	

Including NJR	9.59%	9.46%
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2 **Q10. Why is there such a substantial difference between the ROE recommended by**  
3 **Mr. Rothschild and your recommendation?**

4 A10. The most fundamental reason for this difference is that Mr. Rothschild and I  
5 disagree as to what satisfies the standards established by the United States Supreme  
6 Court of *Hope and Bluefield* and what constitutes a “just and reasonable” return  
7 that is consistent with the returns for other companies with similar or comparable  
8 risk.<sup>5</sup> While Mr. Rothschild acknowledges that if the authorized ROE is below  
9 investors’ expectations, the Company will not be able to raise the capital necessary  
10 to provide safe and reliable service, he incongruently advises the Commission to  
11 ignore the authorized ROEs for other gas utilities and relies on the results of his  
12 CAPM model which are significantly below the range set by recently authorized  
13 ROEs.<sup>6</sup>

14 In addition, and as I address in detail later in my Prepared Rebuttal Testimony, Mr.  
15 Rothschild and I also have fundamentally different views on current and  
16 prospective capital market conditions and the implications for the Company’s cost  
17 of capital. While Mr. Rothschild notes that COVID-19 has resulted in a “historical  
18 financial crisis” and acknowledges that uncertainty and volatility have  
19 characterized capital markets since February 2020, he disregards the relative  
20 performance of gas utilities and the broader market and concludes that the “market

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<sup>5</sup> *Bluefield Water Works Co. v. Publ. Serv. Comm'n.*, 262 U.S. 679 (1923); *Federal Power Comm'n. v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

<sup>6</sup> Rothschild Direct, at 7-8.

1 upheaval has not significantly impacted the cost of equity for gas utility  
2 companies.”<sup>7</sup>

3 Furthermore, as I discuss in detail later in my Prepared Rebuttal Testimony, the  
4 inputs Mr. Rothschild has selected to specify his models, in particular, his CAPM  
5 analyses bias the ROE estimates of his models downwards resulting in a  
6 recommendation that is lower than any ROE authorized for a natural gas  
7 distribution company in the past 40 years.<sup>8</sup> Additionally, Mr. Rothschild either  
8 urges the Commission to ignore certain methodologies (Expected Earnings) or does  
9 not address them at all (Bond Yield Plus Risk Premium).<sup>9</sup> Finally, Mr. Rothschild  
10 does not even address the regulatory and business risks faced by Montana-Dakota  
11 in his recommendation.<sup>10</sup>

12 The investor required return is not established with respect to any individual model.  
13 Rather than endorsing the results of a specific methodology, the Commission  
14 should consider how current market conditions affect the risks for equity investors  
15 as well as the results of a broader range of ROE estimation methodologies. Finally,  
16 the Commission’s adherence to the *Hope* and *Bluefield* decisions suggests that the

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<sup>7</sup> *Id.*, at 29.

<sup>8</sup> Source: Regulatory Research Associates.

<sup>9</sup> Rothschild Direct, at 85.

<sup>10</sup> *Id.*, at 86.

1 methodology is not what is to be determined, but rather a “just and reasonable”  
2 return that is comparable to the return available on investments of similar risk.

3 **Q11. What is your response to Mr. Rothschild’s reasoning as to why he has not**  
4 **considered the authorized returns of other natural gas utilities in the**  
5 **determination of his recommended ROE?**

6 A11. Mr. Rothschild incorrectly contends that the authorized ROEs of other natural gas  
7 utilities are in the past and based on historical data and therefore cannot be  
8 considered especially after factoring in the effect of COVID-19 on the markets.<sup>11</sup>  
9 This assumption is incorrect for three reasons. First, there is clear evidence that  
10 equity analysts and credit rating agencies consider authorized ROEs in the advice  
11 provided about investment opportunities and determination of credit ratings.

12 Second, a comparison of recently authorized ROEs for natural gas utilities will  
13 allow investors to evaluate the expected returns of various comparable investments.  
14 It is reasonable to assume when comparing two utilities that all else equal an  
15 investor will prefer to invest in the utility with the higher authorized return.  
16 Therefore, an authorized ROE well below the returns authorized for other natural  
17 gas utilities can affect a utility’s ability to attract capital. The comparison of the  
18 recommended ROE to recently authorized ROEs provides a basic test of

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<sup>11</sup> Rothschild Direct, at 7-8.

1           reasonableness and a benchmark that investors consider in determining where to  
2           commit equity capital.

3           Finally, as I will discuss in more detail below, Mr. Rothschild’s recommended ROE  
4           of 8.07 percent is well below the authorized return for any natural gas utility from  
5           January 2018 through January 2021. Mr. Rothschild has provided no evidence that  
6           COVID-19 has resulted in a substantial decline in the cost of equity for natural gas  
7           utilities to warrant a comparison to recently authorized ROEs irrelevant. In fact,  
8           Mr. Rothschild’s notes that “the current capital market upheaval has not  
9           significantly impacted the cost of equity for gas utility companies”.<sup>12</sup>

10   **Q12. How does the ROE recommended by Mr. Rothschild compare to the ROE**  
11   **authorized by other Commissions across the U.S.?**

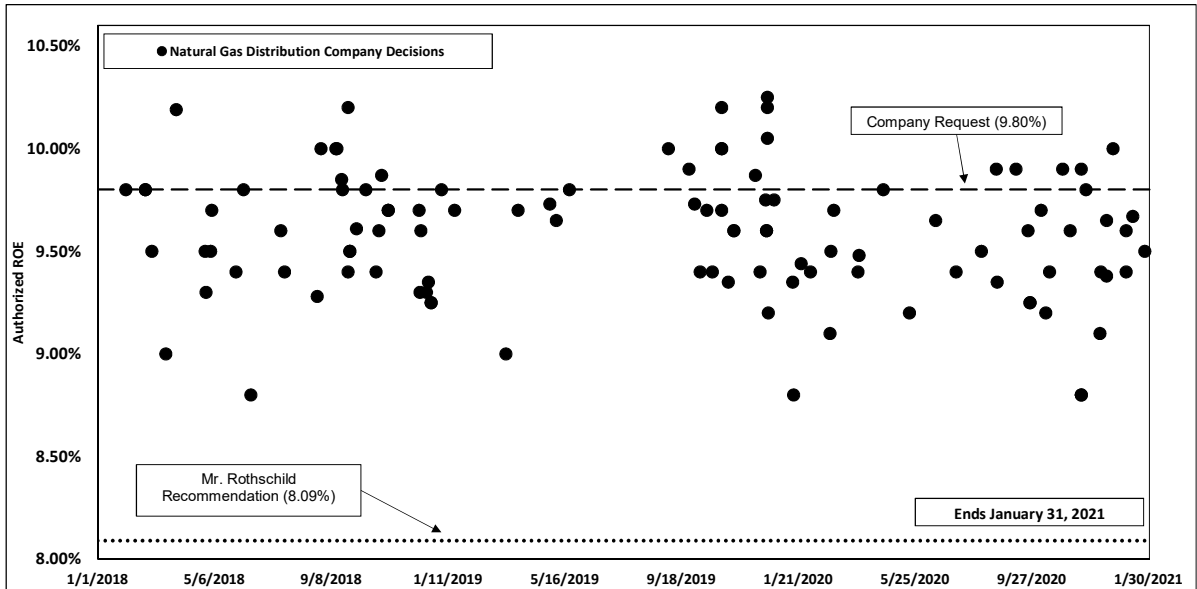
12   A12. Figure 2 shows the authorized returns for natural gas distribution companies in  
13   other jurisdictions from January 2018 through January 2021, the return  
14   recommended by Mr. Rothschild, and the return I recommend. As shown in Figure

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<sup>12</sup>       *Id.*, at 29.

1 2, Mr. Rothschild's recommended ROE of 8.09 percent is well below all of the  
2 authorized ROEs since January 2018.

3 **Figure 2: U.S. Authorized Natural Gas Returns:**  
4 **January 2018 – January 2021<sup>13</sup>**



5  
6 **Q13. Is Mr. Rothschild's ROE recommendation for Montana-Dakota fair and**  
7 **reasonable?**

8 A13. No. The rates set in this case, including the ROE and capital structure, will directly  
9 affect Montana-Dakota's cash flows in the period during which rates are in effect.  
10 The Company's cash flows, in turn, have a direct bearing on its credit quality and  
11 investors' perception of the riskiness of the enterprise. Mr. Rothschild has provided  
12 no justification for why it would be appropriate for the authorized ROE for  
13 Montana-Dakota to be 149 basis points below the average authorized ROE for  
14 natural gas utilities from January 2018 through January 2021.<sup>14</sup> As a result, Mr.

<sup>13</sup> Source: SNL Financial.

<sup>14</sup> S&P Global Market Intelligence.

1 Rothschild's recommendation does not meet the comparable return requirement of  
2 Hope and Bluefield. Moreover, as discussed in below, credit rating agencies  
3 recently have reacted negatively to authorized ROEs that are significantly below  
4 the national average. Therefore, it is likely that adopting Mr. Rothschild's  
5 recommended ROE of 8.09 percent for the Company would result in a similar  
6 response from rating agencies and the market overall.

7 **Q14. Is it also important to consider Mr. Rothschild's recommended ROE in**  
8 **conjunction with Montana-Dakota's equity ratio to determine if he has met the**  
9 **comparable return standard?**

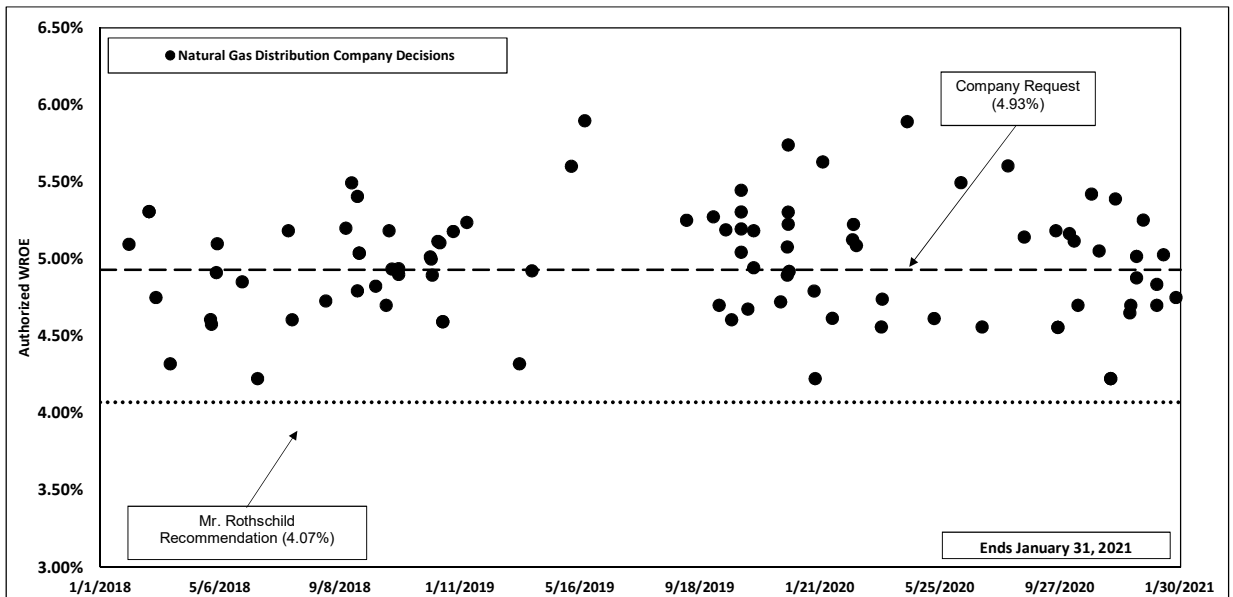
10 A14. Yes. As discussed above, a fundamental aspect of the financial regulation of  
11 utilities is assuring that the subject utility has a reasonable opportunity to earn a  
12 return on capital consistent with the return available on investments of similar risk.  
13 While this principle is most often discussed in terms of the allowed ROE, it is  
14 equally applicable to all aspects of overall Rate of Return ("ROR"). The equity  
15 return, the product of the ROE and the equity ratio, (i.e., the Weighted Return on  
16 Equity ("WROE")), ultimately defines the return to shareholders and the product  
17 of the cost of debt and the debt ratio ensures that a company's debt obligations are  
18 met. Therefore, it is necessary to consider both the rates that are applied to debt and  
19 equity and the composition of the capital structure to determine the reasonableness  
20 of the ROR. Mr. Rothschild has recommended that the Company's proposed  
21 common equity ratio of 50.306 percent be approved. Taken together, the

1 Company’s proposed common equity ratio of 50.306 percent and Mr. Rothschild’s  
 2 recommended ROE of 8.09 percent, results in a WROE of only 4.07 percent.

3 **Q15. Have you conducted an analysis to compare Mr. Rothschild’s proposed**  
 4 **WROE to the recently authorized WROEs in other jurisdictions?**

5 A15. Yes. As shown in Figure 3 below, I compared Mr. Rothschild’s recommended  
 6 WROE and the Company’s request to the authorized WROEs for January 2018  
 7 through January 2021 for natural gas utilities. The Company’s requested WROE is  
 8 4.93 percent, which is below the average WROE for January 2018 through January  
 9 2021 of 4.98 percent. Mr. Rothschild’s recommendation of 4.07 percent is below  
 10 all of the recently authorized WROEs. This provides further support that Mr.  
 11 Rothchild’s recommended ROE of 8.09 percent is unreasonably low and does not  
 12 meet the comparable return standard.

13 **Figure 3: Weighted Authorized ROEs: January 2018 – January 2021<sup>15</sup>**



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<sup>15</sup> Source: Regulatory Research Associates.

1           Additionally, is important to consider the WROE given the effect that the Tax Cuts  
2           Jobs Act (“TCJA”) has had on utility cash flows. As discussed in my Prepared  
3           Direct Testimony, several utilities and utility holding companies have been  
4           downgraded due to the effects of tax reform on utility ratemaking. Therefore, it is  
5           important that the Commission authorize a WROE that is comparable to  
6           investments of similar risk so as to not be viewed as credit negative by the ratings  
7           agencies.

8   **Q16. Are you aware of any utilities that have experienced a credit downgrade**  
9   **related to the financial effects of a rate case decision?**

10 A16. Yes. Credit rating agencies take the authorized ROE into consideration in the  
11 overall risk analysis of a company. For example, Moody’s recently downgraded  
12 ALLETE, Inc. from A3 to Baa1 for reasons that included the less than favorable  
13 outcome in Minnesota Power’s last rate case in Minnesota. Moody’s viewed  
14 Minnesota Power’s recent rate case decision as credit negative for reasons which  
15 included: (1) the below average authorized ROE of 9.25 percent which resulted in  
16 a reduction of approximately \$20 million between the requested and approved  
17 revenue requirement; (2) the disallowance of certain expenses such as prepaid  
18 pension expenses; and (3) the decision to not adopt the annual rate review  
19 mechanism (“ARRM”) which if adopted would have mitigated the effect of

1 industrial customers scaling back production in response to changes in economic  
2 conditions.<sup>16</sup>

3 The credit rating agencies also reacted negatively to the recent rate case decision  
4 for Puget Sound Energy (“PSE”) in Washington. In July 2020, PSE received a rate  
5 determination that included an authorized ROE of 9.40 percent, which represented  
6 a 10 basis point decrease in the prior authorized ROE and a common equity ratio  
7 of 48.5 percent, resulting in an overall rate of return of 7.39 percent (and an equity  
8 rate of 4.559 percent). Each of the rating agencies responded negatively to this  
9 decision. FitchRatings downgraded the outlook on PSE and its parent company  
10 Puget Energy (“PE”) to negative, indicating that the rate order would:

11 [s]ignificantly impair PE’s consolidated credit metrics, raising FFO  
12 leverage to be approximately 6.0x through 2021, exceeding the  
13 downgrade guideline ratio of 5.5x. PE and PSE could be  
14 downgraded if mitigating actions are not forthcoming or insufficient  
15 to strengthen their credit metrics. Sustained lack of constructive  
16 regulatory relationship will also be a catalyst for a downgrade.<sup>17</sup>

17 S&P’s ratings outlook for PSE and PE is negative, reflecting expectations that the  
18 FFO to debt ratio for PE would be 13 percent. S&P also stated that “[t]he decision  
19 is inconsistent with our current assessment and should the company continue to  
20 exhibit substantial regulatory lag, we would likely revise our assessment of the  
21 company’s business risk profile downward.”<sup>18</sup> Moody’s indicated that the outcome

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<sup>16</sup> Moody’s Investors Service, Credit Opinion: ALLETE, Inc. Update following downgrade, at 3 (April 3, 2019).

<sup>17</sup> FitchRatings, Rating Action Commentary, “Fitch Affirms Puget Energy and Puget Sound Energy; Outlook Revised to Negative, July 27, 2020.

<sup>18</sup> S&P Global Market Intelligence, S&P removes Puget Energy, Puget Sound Energy from CreditWatch, August 24, 2020.

1 of the rate case was credit negative, recognizing a below average return on equity  
2 that was lower than the prior authorized ROE.<sup>19</sup>

3 Mr. Rothschild's recommendation of 8.09 percent is well below the recently  
4 authorized ROEs for ALLETE, Inc. and PSE. Furthermore, Mr. Rothschild's  
5 proposed equity rate of 4.07 percent is less than the authorized equity rate for PSE  
6 and therefore, would likely be view negatively by the credit rating agencies.

7 **Q17. Was the credit rating of Southwest Gas affected by the determination in recent**  
8 **rate proceedings?**

9 A17. Yes. Credit and equity analysts downgraded Southwest Gas Holdings as a result  
10 of recent rate case determinations. In December 2020, Bank of America  
11 downgraded Southwest Gas Holdings from neutral to underperform based  
12 primarily on the company's recent rate case outcome in Arizona. In January 2020,  
13 Moody's downgraded Southwest Gas Corporation and Southwest Gas Holdings  
14 from A3 to Baa1. Moody's indicated that the ratings downgrade reflected  
15 weakening credit profiles resulting from high debt to sustain capital expenditures,  
16 slow growth in operating cash flow due to tax reform and regulatory lag. In  
17 addition, Moody's indicated that the ROE determination (9.10 percent) and  
18 reduction in equity ratio (51.10 percent) in the company's Arizona were both  
19 viewed as credit negative. Finally, Moody's noted that the results of the Nevada  
20 rate proceedings, where the ROE was set at 9.25 percent with equity capital of 49.26

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<sup>19</sup> Moody's Investor Service, Puget Sound Energy, Inc. Puget Sound Energy's rate case outcome is credit negative, July 17, 2020.

1 percent would not maintain the utility's credit metrics to levels characteristic with  
2 the A3 rating.<sup>20</sup>

3 **Q18. What factors should be considered in evaluating the results of ROE models**  
4 **and establishing the authorized ROE?**

5 A18. The primary factors that should be considered are: (i) the importance of investors'  
6 actual return requirements and the critical role of judgment in selecting the  
7 appropriate ROE; (ii) the importance of providing a return that is comparable to  
8 returns on alternative investments with commensurate risk; (iii) the need for a  
9 return that supports a utility's ability to attract needed capital at reasonable terms;  
10 and (iv) the effect of current and expected capital market conditions.

11 **III. CAPITAL MARKET CONDITIONS**

12 **Q19. Please summarize Mr. Rothschild's positions on capital market conditions.**

13 A19. Mr. Rothschild devotes several pages of testimony to stock price trends, interest  
14 rates, credit spreads, and volatility. Specifically, he notes that interest rates are low,  
15 and the expectation is that interest rates will remain low, volatility expectations  
16 have fallen and the option-implied Betas for his gas proxy group have declined;  
17 thus, Mr. Rothschild concludes that even though the market has been affected by

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<sup>20</sup> Moody's Investor Service, Rating Action: Moody's downgrades Southwest Gas Corporation and Southwest Gas Holdings; outlook stable, January 29, 2021.

1 COVID-19, the cost of equity for natural gas utilities has remained stable and even  
2 possibly declined.<sup>21</sup>

3 **Q20. Mr. Rothschild suggests that the low interest rate environment supports a**  
4 **lower authorized ROE for Montana-Dakota.<sup>22</sup> Do you agree?**

5 A20. No, I do not agree. Government bond yields are only one of many factors that  
6 equity investors consider in determining their return requirements. It is important  
7 to view current Treasury bond yields in the context of conditions in the economy  
8 and capital markets. It would not be reasonable for the Commission to consider  
9 only the decline in 30-year Treasury bond yields, without also considering the  
10 recent market conditions that have contributed to that decline. Further, there are  
11 reasons to believe that the recent declines in Treasury bond yields are not  
12 representative of the longer-term trend in government and corporate bond yields.  
13 Rather, those lower interest rates are directly attributable to the COVID-19  
14 pandemic. The economic effects of the measures used to contain COVID-19 have  
15 caused the Federal Reserve to reduce the federal funds rate and take additional  
16 measures to support the U.S. economy and provide liquidity and stability in  
17 financial markets. These are short-term events that have little to do with the longer-  
18 term trend in bond yields or equity costs. As I will discuss below, long-term interest  
19 rates have trended upwards over the past few months and it is reasonable to expect

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<sup>21</sup> Rothschild Direct, at 17-30.

<sup>22</sup> *Id.*, at 22.

1 this trend to continue as the economy enters the recovery phase of the business  
2 cycle.

3 **Q21. Mr. Rothschild acknowledges increased volatility in the market due to**  
4 **COVID-19, however he concludes that “investors do not require a higher cost**  
5 **of equity for gas utility companies despite the current market turbulence.”<sup>23</sup>**

6 **Do you agree?**

7 A21. No. As discussed in my Prepared Direct Testimony, capital market conditions have  
8 been extremely volatile in 2020.<sup>24</sup> This is due to the economic effects of the  
9 COVID-19 pandemic, as the measures used to contain the COVID-19 pandemic  
10 have forced the U.S. economy into a recession. As a result, volatility has increased  
11 to levels not seen since the Great Recession of 2008/09. I have updated Figure 3  
12 from my Prepared Direct Testimony, which contained the VIX to measure volatility  
13 in the market. As shown in Figure 4, the VIX has remained well above its long-  
14 term average in the months following the filing of my Prepared Direct Testimony  
15 in August. Furthermore, the VIX as of December 31, 2020 is much greater than it  
16 was at the time of the Commission’s decision in Montana-Dakota’s last rate case.  
17 While Mr. Rothschild acknowledges the increase in the VIX, he only notes that the  
18 VIX has declined since March without further recognizing that: a) it is still well

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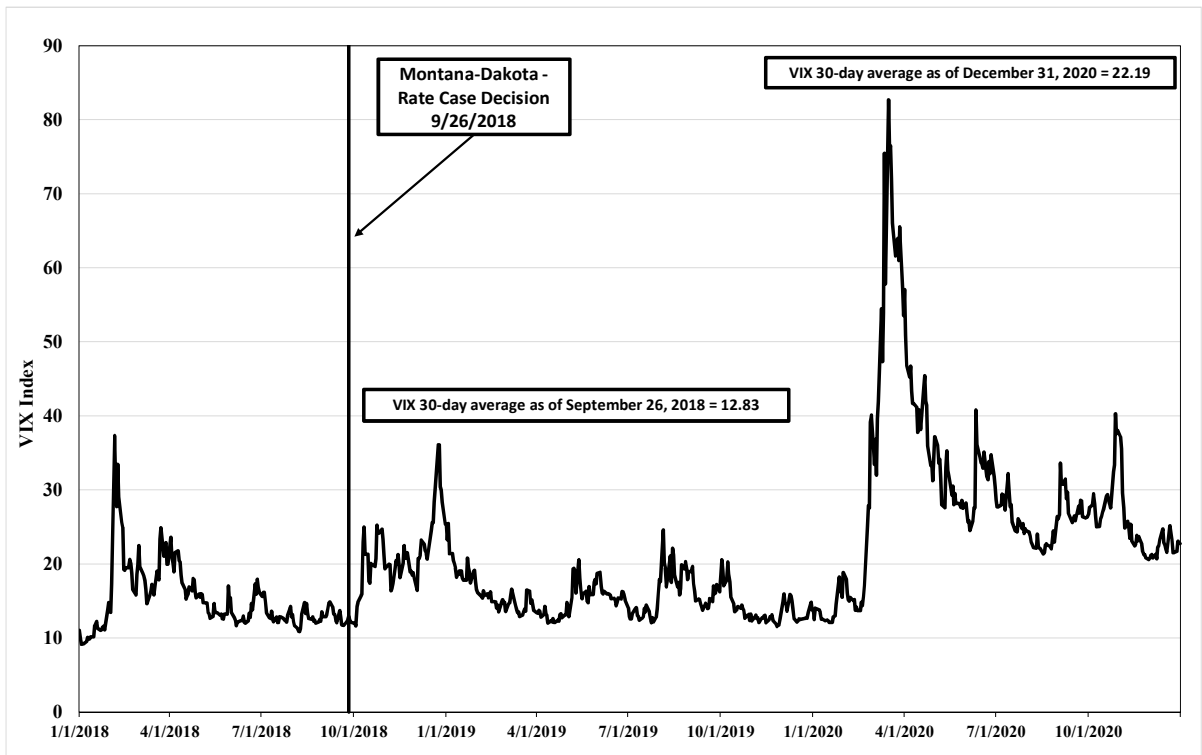
<sup>23</sup> *Id.*, at 30.

<sup>24</sup> Prepared Direct Testimony of Ann E. Bulkley (“Bulkley Prepared Direct”), at 12-15.

1 above pre-COVID-19 levels; and b) it is well above the level at the time of the  
 2 Commission’s decision in Montana-Dakota’s last rate case.

3 Furthermore, Chart 8 in Mr. Rothschild’s Direct Testimony provides evidence  
 4 counter to his conclusion. As shown in Chart 8, the volatility level of his proxy  
 5 group was more than 40 in March but as of December was still more than 30.<sup>25</sup>  
 6 Therefore, the volatility levels he calculated for his gas proxy group are still well  
 7 above the pre-pandemic level of approximately 20 in January 2020. This shows that  
 8 there is still much uncertainty regarding the effect of COVID-19 on natural gas  
 9 utilities.

10 **Figure 4: CBOE VIX January 2018 – December 2020<sup>26</sup>**



11

<sup>25</sup> Rothschild Direct, at 28.  
<sup>26</sup> Source: Bloomberg Professional.

1 **Q22. In your Prepared Direct Testimony, you discussed the unprecedented**  
2 **intervention by the Federal Reserve and U.S. Congress to stabilize financial**  
3 **markets and support the economy. Has Mr. Rothschild considered this?**

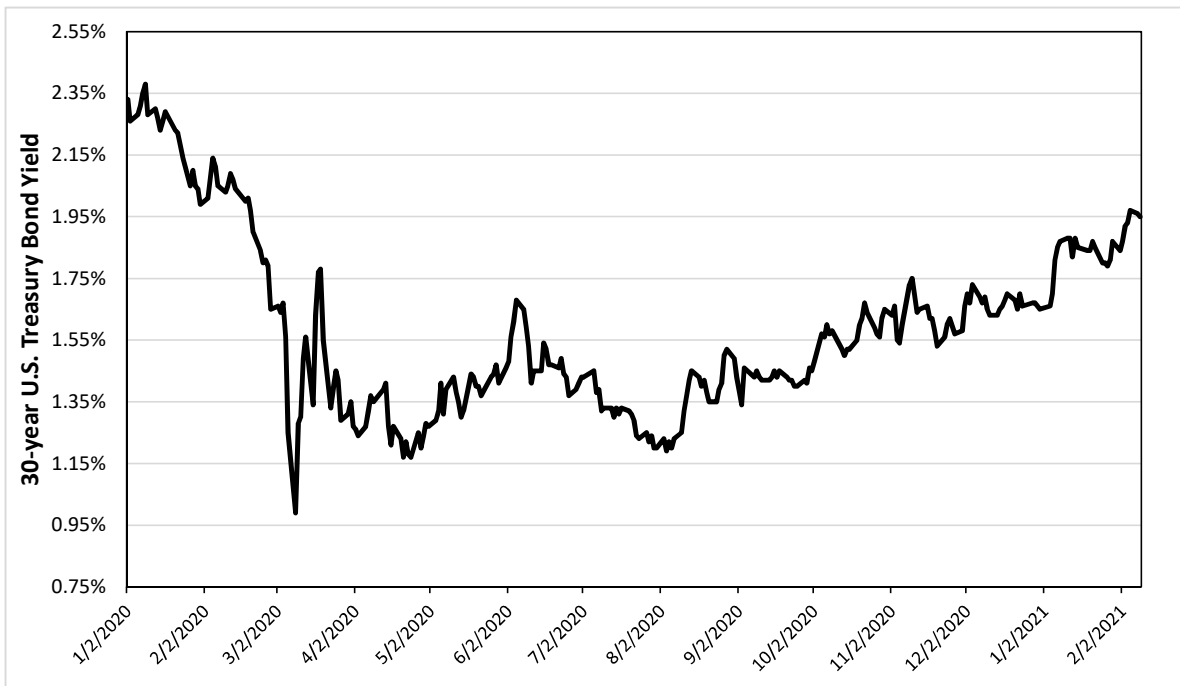
4 A22. Mr. Rothschild indirectly shows how the market has responded in Charts 1 and 2  
5 of his testimony. These charts show the stock price performance of the S&P 500  
6 and Mr. Rothschild's natural gas proxy group. As shown in Chart 2 of his  
7 testimony, the share price of the S&P 500 has increased since the collapse that  
8 occurred through mid-March while the share prices of Mr. Rothschild's gas proxy  
9 group have also increased; however, the increase has been far less than that of the  
10 S&P 500. The increase in equity prices is directly related to the Federal Reserve's  
11 and the Federal Government's response to the financial market uncertainty  
12 surrounding COVID-19. As discussed in my Prepared Direct Testimony, the  
13 Federal Reserve's expansive programs greatly increased the money supply, which  
14 resulted in lower borrowing costs for corporations and thus continued access to the  
15 capital needed to offset the economic effects of COVID-19. Thus, interest rates  
16 remained low, and stability has been restored in the corporate bond market. For  
17 investors, this led to allocating more funds to equities. These expansive monetary  
18 and fiscal programs have provided for greater price stability by mitigating the  
19 economic effects of the COVID-19 pandemic. Nevertheless, as shown in Figure 4  
20 above, there is still uncertainty regarding the near-term effect of COVID-19 on the

1 economy and the financial markets, which is why the VIX is still above its long-  
 2 term historical level.

3 **Q23. How have interest rates responded since the time when you filed your**  
 4 **Prepared Direct Testimony?**

5 A23. As shown in Figure 5 below, yields on the 30-year Treasury bond have been  
 6 increasing since August 2020.

7 **Figure 5: Yield on 30-year Treasury bond**  
 8 **January 2020 - February 2021**



9  
 10 **Q24. Has Mr. Rothschild considered the underperformance of the companies in his**  
 11 **proxy group relative to the market since Mid-March?**

12 A24. Mr. Rothschild has noted the underperformance of the companies in his proxy  
 13 group; however, he has not acknowledged how this underperformance affects the  
 14 cost of equity for natural gas utilities. The utility sector is classified as a defensive

1 section given the nature of its essential service which is usually not affected to a  
2 large degree by changes in the business cycle. In the case of the COVID-19  
3 pandemic, investors were concerned with the effect of COVID-19 on natural gas  
4 utilities which resulted in underperformance relative to the market since Mid-  
5 March. The underperformance indicates investors view added risk associated with  
6 an investment in the natural gas industry which would imply an increase in the cost  
7 of equity for natural gas utilities counter to Mr. Rothschild's claim that the cost of  
8 equity has remained the same or even declined.

9 Furthermore, as I will discuss in more detail below, the underperformance of utility  
10 sector is expected to continue over near-term as the economy enters the recovery  
11 phase of the business cycle. Thus, I do not agree with Mr. Rothschild's use of spot  
12 share prices as a reasonable indicator of the share prices that will exist over the  
13 near-term, nor do I agree with his use of the average of the high and low share  
14 prices over the past year as an indicator of share prices that will exist over the near-  
15 term given the substantial changes that have occurred in the market over the past  
16 year and the expectations for utilities over the near-term.

17 **Q25. What will be the effect of the accommodative policies of the Federal Reserve**  
18 **and Congress on the long-term government bond yields over the near-term?**

19 A25. The goal of the Federal Reserve's accommodative monetary policy is to achieve  
20 the Federal Reserve's dual mandate of maximum employment and stable prices.  
21 Although the current accommodative monetary policy will keep short-term interest  
22 rates low, the Federal Reserve has not committed to keeping long-term interest rates  
23 low. Long-term interest rates can increase even though monetary policy is

1 accommodative. In fact, one of the leading indicators used by investors to  
2 determine what stage of the business cycle the economy is in is to review the yield  
3 curve which shows the difference between long-term and short-term interest rates.  
4 A flat or inverted yield curve occurs when long-term interest rates are equivalent to  
5 or less than short-term interest rates and usually occurs prior to a recession while a  
6 steepening yield curve which occurs when the difference between long-term  
7 interest rates and short-term interest rates is increasing and indicates that the  
8 economy is entering a period of economic expansion following a recession.<sup>27</sup>

9 **Q26. Have you reviewed the yield curve to determine investors' expectations**  
10 **regarding the economy over the near-term?**

11 A26. Yes, I have. Specifically, I calculated the difference between the yield on the 10-  
12 year Treasury Bond and the yield on the 2-year Treasury Bond from January 2018  
13 to January 2021. I selected the 10-year Treasury Bond yield to represent long-term  
14 interest rates and the yield on the 2-year Treasury Bond to represent short-term  
15 interest rates. As shown in Figure 6, the yield curve has been steepening and has  
16 increased to approximately 100 basis points which is a level not seen since the  
17 beginning of 2017. The steepening of the yield curve indicates that investors expect  
18 economic growth and inflation to increase in the near-term as a result they rotate  
19 out of long-term government bonds to avoid being locked into to low interest rates  
20 for the long-term. A fact Mr. Rothschild has acknowledged when he stated “[a]  
21 steep yield curve indicates investors expected economic conditions to improve

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<sup>27</sup> “What is a yield curve”, Fidelity.com. <https://www.fidelity.com/learning-center/investment-products/fixed-income-bonds/bond-yield-curve>

1 because, with expected profitable investment opportunities, they require a  
2 significant premium in order to commit their money for long periods of time”.<sup>28</sup>

3 The steep yield curve signals that higher yields are required by investors to invest  
4 in long-term government bonds.

5 **Figure 6: 10-year Treasury Bond Yield Minus 2-year Treasury Bond**  
6 **Yield – January 2017 – January 2021<sup>29</sup>**



7  
8 **Q27. What have equity analysts said about the steepening of the yield curve?**

9 A27. Several equity analysts have noted that the yield curve is steepening and is expected  
10 to continue to steepen into 2021 which is an indicator that the economy is entering  
11 the early expansion phase of the business cycle. For example, in a recent  
12 Bloomberg article, Morgan Stanley indicated that they expected a “V-shaped”

<sup>28</sup> Rothschild Direct, at 23.

<sup>29</sup> Federal Reserve Bank of St. Louis, 10-Year Treasury Constant Maturity Minus 2-Year Treasury Constant Maturity [T10Y2Y], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/T10Y2Y>, February 2, 2021.

1 economic recovery and therefore advised investors to underweight government  
 2 bonds and overweight equities.<sup>30</sup> Similarly, in a recent Bloomberg article,  
 3 Goldman Sachs noted the following:

4 “As the economic recovery consolidates next year, we expect to see  
 5 more differentiation across the curve, with policymakers  
 6 committing to keeping front-end rates low, but higher expectations  
 7 for real growth and inflation driving long-end rates higher,”  
 8 Goldman strategists including Zach Pandl wrote in the report,  
 9 released Tuesday.

10 “This should be especially true in the U.S. due to the Federal  
 11 Reserve’s new average inflation targeting framework, which  
 12 commits the central bank to holding off on rate hikes until inflation  
 13 has reached its target and is on track to overshoot it.”<sup>31</sup>

14 Finally, in a recent Barron’s article, Citigroup also projected that the yield on the  
 15 10-year Treasury bond is expected to increase in 2021, which prompted Citigroup’s  
 16 recommendation to overweight equities and favor cyclical sectors over defensive  
 17 sectors such as utilities.<sup>32</sup>

18 **Q28. Has Mr. Rothschild examined the effect of a steepening yield curve on the cost**  
 19 **of equity for utilities?**

20 A28. No. Mr. Rothschild has acknowledged that the yield curve has steepened, but he  
 21 does not discuss expectations regarding the yield curve over the near-term term nor  
 22 has he evaluated the effect of a steepening yield curve on the cost of equity for

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<sup>30</sup> Ossinger, Joanna. “Morgan Stanley Says Go Risk-On and ‘Trust the Recovery’ in 2021.” Bloomberg.com, 15 Nov. 2020, www.bloomberg.com/news/articles/2020-11-16/morgan-stanley-says-go-risk-on-and-trust-the-recovery-in-2021.

<sup>31</sup> McCormick, Liz. “Goldman Goes All-In for Steeper U.S. Yield Curves as 2021 Theme.” Bloomberg.com, 10 Nov. 2020, www.bloomberg.com/news/articles/2020-11-10/goldman-goes-all-in-for-steeper-u-s-yield-curves-as-2021-theme.

<sup>32</sup> Keown, Callum. “10-Year Treasury Yields Will Rise Into 2021, Citi Says. This ‘Aggressive’ Equity Strategy Can Outperform.” Barrons.com, 16 Nov. 2020, www.barrons.com/articles/10-year-treasury-yields-will-rise-into-2021-citi-says-this-aggressive-equity-strategy-can-outperform-51605543920.

1 utilities. In fact, later in his testimony, he contradicts his statement regarding the  
2 steepening of the yield curve when he states “[l]ow yields on long-term U.S.  
3 Treasury bonds indicate that investors do not expect interest rates to increase any  
4 time soon because when interest rates increase the owner of a long-term bond will  
5 lose money”.<sup>33</sup> However, Mr. Rothschild and I agree that the Federal Reserve has  
6 indicted they will keep short-term rates low over the near-term; therefore, the only  
7 way for the yield curve to steepen as it has over recent months is for long-term  
8 interests rates to increase. Mr. Rothschild clearly has not fully considered this  
9 effect given the contradicting statements in his testimony nor has he considered that  
10 increases in interest rates will increase the cost of equity for utilities.

11 **Q29. Have equity analysts specifically commented on the performance of the utility**  
12 **sector over the near-term?**

13 A29. Yes. In a recent article, Barron’s surveyed ten market strategists and chief  
14 investment officers regarding the outlook for 2021. In addition to forecasting  
15 increases in the 10-year Treasury Bond yield and a continued steepening of the  
16 yield curve, the market strategists rated utilities as a near-consensus underweight.<sup>34</sup>

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<sup>33</sup> Rothschild Direct, at 82-83.

<sup>34</sup> Jasinski, Nicholas. “The Stock Market Could Gain Another 10% Next Year, Experts Say.” Barron's, 19 Dec. 2020, [www.barrons.com/articles/the-stock-market-could-gain-in-2021-51608339301](http://www.barrons.com/articles/the-stock-market-could-gain-in-2021-51608339301).

1           Therefore, the market strategists surveyed by Barron’s are projecting that utilities  
2           will underperform the broader market in 2021.

3   **Q30. How has the utility sector performed historically during periods when the**  
4           **yield curve is steepening, and the economy is in the early stage of the business**  
5           **cycle?**

6   A30. In a recent report, Fidelity noted that the utility sector has historically been one of  
7           the worst performing sectors during the early phase of the business cycle with a  
8           geometric average return of -10.5 percent.<sup>35</sup> This is important because if the utility  
9           sector underperforms over the near-term then the DCF model which relies on  
10          historical averages of share prices is likely to understate the cost of equity for  
11          Montana-Dakota over the near-term or the period that Company’s rates will be in  
12          effect.

13   **Q31. What are your conclusions regarding the effect of volatility, the policies of the**  
14          **Federal Reserve and the effect of a steepening yield curve on the cost of equity**  
15          **for Montana-Dakota?**

16   A31. While Mr. Rothschild has reviewed data regarding capital market conditions  
17          including interest rates, volatility, credit spreads, the yield curve and utility share  
18          prices, he has not specifically considered how these market conditions are affecting  
19          the ROE estimates produced by DCF and CAPM models which results in his  
20          incorrect conclusion that the cost of equity for natural gas utilities has remain stable  
21          or even declined. Further, Mr. Rothschild’s review of capital market conditions

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<sup>35</sup> Fidelity Investments, “The Business Cycle Approach to Equity Sector Investing,” 2020.

1 fails to justify his recommendation of 8.09 percent which is significantly below the  
2 9.40 percent authorized ROE approved for Montana-Dakota in 2018. Mr.  
3 Rothschild's failed review of capital market conditions is manifested in two ways.  
4 First, as shown in Figure 4 above, volatility as measured by the VIX is still above  
5 the long-term median. This demonstrates that there is still uncertainty in the market  
6 which means greater risk and thus higher return requirements for investors.  
7 Second, while the Federal Reserve has indicated it will keep short-term interest  
8 rates low over the next few years to support the economic recovery this does not  
9 mean that long-term interest rates cannot increase. In fact, many equity analysts  
10 believe long-term interest rates will increase in 2021 as the economy enters the  
11 early expansion phase of the business cycle. Historically, the utility sector has  
12 underperformed the broader market as interest rates increase and the economy  
13 recovers.

14 Investors' current expectations regarding the economy highlight the importance of  
15 using forward-looking inputs in the models used to estimate the cost of equity. For  
16 example, while the growth rate in the DCF model can be estimated using  
17 projections, the DCF model relies on historical average of share prices. If utilities  
18 underperform the broader market as expected by investors, then the DCF model  
19 will understate the cost of equity for Montana-Dakota during the period that rates  
20 will be in effect. Conversely, two out of three inputs (i.e., risk-free rate and market  
21 risk premium) in the CAPM can be estimated using forward-looking projections.

1           Therefore, the CAPM if specified correctly is likely to capture more effectively the  
2           economic conditions expected by investors over the near-term.

3   **Q32. Does Mr. Rothschild comment on the current valuations of the utility sector?**

4   A32. Mr. Rothschild notes that stock prices as well as P/E ratios including those of the  
5           natural gas companies in his proxy group increased significantly in recent years.<sup>36</sup>  
6           According Mr. Rothschild, the high valuations of utilities indicate the cost of equity  
7           has decreased for utilities because investors are willing to pay a higher price for the  
8           same level of earnings. Mr. Rothschild does acknowledge that the stock prices for  
9           his gas utility proxy group have declined since the peak in February prior to the  
10          COVID-19 pandemic. However, he fails to recognize how high valuations affect  
11          the results of the DCF model.

12          The DCF model generally produces reasonable and reliable estimates of the cost of  
13          equity for companies in stable, mature industries, such as regulated utilities;  
14          however, the results of the DCF model are being distorted by the high valuations  
15          and low dividend yields of utilities. Equity analysts have commented on the  
16          unusually high valuations of utility shares compared to historical levels.

17   **Q33. Does Mr. Rothschild recognize the significance of the current, high valuations**  
18          **in the utilities sector?**

19   A33. No, he does not. According to Mr. Rothschild, current stock and bond prices reflect  
20          all relevant information that is known to and considered by investors.<sup>37</sup> His reliance  
21          on current stock and bond prices assumes that markets are efficient. But that is not

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<sup>36</sup> Rothschild Direct, at 20-21.

<sup>37</sup> *Id.*, at 32.

1 always the case. In fact, in a recent interview with Barron's, Professor Aswath  
2 Damodaran noted the following regarding the efficient market assumption:

3 I'm not an academic. I'm a pragmatist. I don't believe that markets  
4 are efficient, but I also don't believe that much of active investing,  
5 at least as practiced now, has a prayer at finding and exploiting these  
6 inefficiencies for profit. But I do think that markets always convey  
7 messages. And if you ignore those messages, or you think you're  
8 bigger than the market, the market's going to take you down several  
9 notches. So I think that is my overriding message—get away from  
10 static to dynamic, from backward-looking to forward-looking. And  
11 that scares people.<sup>38</sup>

12 Similarly, Warren Buffet noted the following regarding efficiency in the market:

13 I'm convinced that there is much inefficiency in the market. These  
14 Graham-and-Doddsville investors have successfully exploited gaps  
15 between price and value. When the price of a stock can be influenced  
16 by a "herd" on Wall Street with prices set at the margin by the most  
17 emotional person, or the greediest person, or the most depressed  
18 person, it is hard to argue that the market always prices rationally.  
19 In fact, market prices are frequently nonsensical.<sup>39</sup>

20 Mr. Rothschild's assumption that markets are efficient results in the incorrect  
21 conclusion that the current valuations of utilities are appropriate. Thus, Mr.  
22 Rothschild fails to take into consideration that the current, high valuations in the  
23 utilities sector result in dividend yields below the historical average for utilities.

24 **Q34. What have equity analysts said about the valuations of utility stocks since you**  
25 **filed your Prepared Direct Testimony?**

26 A34. Several equity analysts have recognized that utility stock valuations remain very  
27 high relative to historical levels even after the decline in share prices that occurred

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<sup>38</sup> Root, Al. "Buying Tesla at \$180 and Other Investing Nuggets From NYU Professor Aswath Damodaran." Barron's, 25 June 2020, [www.barrons.com/articles/how-to-value-stocks-according-to-nyu-professor-aswath-damodaran-51593082800](http://www.barrons.com/articles/how-to-value-stocks-according-to-nyu-professor-aswath-damodaran-51593082800).

<sup>39</sup> Buffett, Warren. The Superinvestors of Graham-and-Doddsville. Columbia Business, 17 May 1984, [www8.gsb.columbia.edu/articles/columbia-business/superinvestors](http://www8.gsb.columbia.edu/articles/columbia-business/superinvestors).

1 as a result of the economic effects of COVID-19. Furthermore, analysts are  
2 considering the expected performance of utilities over the near-term given the  
3 current high valuations and the expected recovery of the economy. For example,  
4 Charles Schwab has classified the Utilities sector as “Underperform,” noting that:

5 The Utilities sector has tended to perform relatively better when  
6 concerns about slowing economic growth resurface, and to  
7 underperform when those worries fade. That’s partly because of the  
8 sector’s traditional defensive nature and steady revenues—people  
9 need water, gas and electric services during all phases of the  
10 business cycle. And low interest rates that typically come with a  
11 weak economy provide cheap funding for the large capital  
12 expeditions required in this industry.

13 However, valuations have been driven up in recent years as  
14 investors have reached for yield in this new era of low interest rates;  
15 this may decrease the sector’s traditional defensive characteristics.  
16 And while interest rates are expected to remain generally low, they  
17 could edge higher as the economy continues to expand. On the flip  
18 side, there is the potential for a renewed decline in the economy to  
19 push rates even lower, or there could be significant government  
20 funding to Utilities as part of clean-energy initiatives that would  
21 benefit the sector’s profit outlook.<sup>40</sup>

22 As Charles Schwab notes the utility sector typically underperforms during periods  
23 of economic growth; however, Charles Schwab also observes that given the high  
24 valuations of the utility sector even if volatility were to increase again, the utility

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<sup>40</sup> Charles Schwab, Utilities Sector Rating: Underperform, January 14, 2021.

1 sector might still underperform in a market setting where utilities have traditionally  
2 outperformed.

3 **Q35. What are your conclusions regarding the recent valuations of utilities and the**  
4 **effect on the cost of equity for Montana-Dakota in this proceeding?**

5 A35. The current high valuations of utilities result in low dividend yields for utilities,  
6 which means that DCF models using recent historical stock price likely  
7 underestimate investors' required returns. This consideration regarding the DCF  
8 model is important especially in light of the expectation that the utility sector will  
9 underperform relative to the broader market as the economy recovers from the  
10 COVID-19 pandemic. Alternatively, my CAPM analysis includes estimated returns  
11 based on near-term and longer-term projected interest rates, considers Beta  
12 coefficients that reflect the increased risk of utilities as a result of the COVID-19  
13 pandemic, and relies on a forward-looking estimate of the market return. Therefore,  
14 it is important to consider the results of each of the models to reflect investors'  
15 expectations of market conditions over the period that the rates established in this  
16 proceeding will be in effect.

17 **Q36. Has Mr. Rothschild considered the effects of the TCJA when developing his**  
18 **recommended ROE?**

19 A36. No, he has not. Mr. Rothschild does not consider the TCJA in his Direct Testimony.  
20 Because Mr. Rothschild did not specifically consider the effects of the TCJA, it  
21 appears he believes that any effect of the TCJA is already taken into consideration  
22 in the share prices that are used in the DCF models. As discussed in my Prepared  
23 Direct Testimony, the TCJA has been identified by the credit rating agencies as

1 credit negative due to the increase to the financial risk of the utilities sector.<sup>41</sup> As  
2 shown in Figure 8 of my Prepared Direct Testimony, Moody's has continued to  
3 downgrade utilities in 2020 as a result of tax reform, which suggests that Moody's  
4 is continuing to evaluate the effect of the TCJA on the cash flows of individual  
5 utilities. This is an important factor to consider in setting the appropriate ROE and  
6 equity ratio for Montana-Dakota.

#### 7 **IV. RESPONSE TO STAFF WITNESS MR. ROTHSCHILD**

8 **Q37. Please summarize Staff witness Rothschild's testimony and recommendations.**

9 A37. Mr. Rothschild develops a cost of equity range for the average company in his  
10 natural gas proxy group of 8.10 percent to 8.41 percent.<sup>42</sup> The low-end of his range  
11 is set equal to the average of the low-end results of Mr. Rothschild's DCF and  
12 CAPM analyses, while the high-end of the range is set equal to the high-end results  
13 of his DCF and CAPM analyses. Ultimately, Mr. Rothschild recommends an 8.09  
14 percent ROE for Montana-Dakota's natural gas operations in North Dakota. His  
15 recommendation is based on the midpoint of his cost of equity range minus a 16-  
16 basis point reduction to account for the decreased financial risk associated with the  
17 Company's proposed equity ratio which Mr. Rothschild claims is above the average  
18 equity ratio for his proxy group. Mr. Rothschild accepts Montana-Dakota's

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<sup>41</sup> Bulkley Prepared Direct, at 27-29.

<sup>42</sup> Rothschild Direct, at Schedule ALR-2.

1 proposed capital structure of consisting of 50.306 percent common equity, 42.37  
2 percent long-term debt and 7.324 percent short-term debt.<sup>43</sup>

3 **Q38. Please summarize the areas of disagreement between Mr. Rothschild's ROE**  
4 **analysis and yours.**

5 A38. Mr. Rothschild and I disagree in the following areas: 1) the composition of the  
6 proxy group; 2) the growth rates used in Mr. Rothschild's application of the  
7 Constant Growth DCF model and the reasonableness of his results; 3) Mr.  
8 Rothschild's application of the Non-Constant Growth DCF model; 4) the  
9 appropriate inputs to a forward-looking CAPM analysis and the reasonableness of  
10 the results of Mr. Rothschild's CAPM; 5) the relevance of considering alternative  
11 financial models, such as the Bond Yield Plus Risk Premium and Expected  
12 Earnings analyses; 6) whether the business risks of Montana-Dakota relative to the  
13 proxy group companies support an ROE higher than the mean for the proxy group;  
14 and 7) Mr. Rothschild's proposed adjustment to the cost of equity which he  
15 attributes to the Company's capital structure.

16 **A. Composition of the Proxy Group**

17 **Q39. Please comment on Mr. Rothschild's proxy group.**

18 A39. Mr. Rothschild testifies that he used "the same 10 publicly traded gas utility  
19 companies used by Ms. Bulkley" in her proxy group.<sup>44</sup> This is incorrect. While  
20 Mr. Rothschild included all of the companies used in my proxy group in his, he also

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<sup>43</sup> Rothschild Direct, at 4.

<sup>44</sup> *Id.*, at 32.

1 included four additional companies: Chesapeake Utilities Corporation  
2 (“Chesapeake”), NiSource Inc. (“NiSource”), New Jersey Resources Corporation  
3 (“NJR”), and UGI Corp. (“UGI”). As I discuss in more detail below, none of these  
4 companies satisfied the screening criteria I used to select my proxy group of  
5 companies comparable to Montana-Dakota. Mr. Rothschild doesn’t discuss the  
6 screening criteria he used to develop his proxy group.

7 **Q40. Please explain why the four companies Mr. Rothschild added did not satisfy**  
8 **the screening criteria you used to develop your proxy group.**

9 A40. Chesapeake was excluded from my proxy group because: (a) the company does not  
10 currently have a credit rating from either S&P or Moody’s and therefore would not  
11 meet my investment grade credit rating screen; and (b) does not generate 60 percent  
12 of regulated operating income from natural gas operations since the company has  
13 both regulated electric and natural gas transmission operations.

14 NiSource was excluded due to its \$1.1 billion sale of Columbia Gas of  
15 Massachusetts to Eversource Energy which just recently closed on October 9, 2020  
16 but would be included in the data relied on in my modeling.<sup>45</sup>

17 UGI was excluded from my proxy group because the company derives only  
18 approximately 27 percent of its total operating income from regulated operations  
19 and the remainder from unregulated propane and international operations. In order

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<sup>45</sup> Kirong Nephele, “NiSource closes \$1.1B sale of Columbia Gas to Eversource,” S&P Global Market Intelligence, October 9, 2020.

1 to establish a group of regulated natural gas companies, I rely on a screen that  
2 requires at least 70 percent of total operating income from regulated operations.

3 Finally, as I discussed in my Prepared Direct Testimony, NJR was excluded from  
4 my proxy group because the company did not derive more than 70 percent of its  
5 total operating income from regulated operations over the three-year period 2017  
6 to 2019.<sup>46</sup>

7 **Q41. What is your conclusion with respect to the proxy group used to estimate the**  
8 **cost of equity for Montana-Dakota?**

9 A41. My primary conclusion is that the composition of the proxy group is not a  
10 significant driver in the differences between Mr. Rothschild's recommended ROE  
11 and mine. While I continue to believe that my screening criteria result in a more  
12 risk comparable proxy group to Montana-Dakota, I have limited my response on  
13 this issue to focus more attention on what is causing the substantial differences in  
14 our respective ROE analyses and recommendations.

15 **B. Constant Growth DCF Model**

16 **Q42. Please summarize Mr. Rothschild's Constant Growth DCF analyses.**

17 A42. Mr. Rothschild's Constant Growth DCF analysis is based on average dividend  
18 yields and retention growth rates for the proxy companies. The results produced  
19 by Mr. Rothschild's Constant Growth DCF analysis are a low of 9.48 percent  
20 (based on spot stock prices as of December 31, 2020) and a high of 9.54 percent

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<sup>46</sup> Bulkley Prepared Direct, at 35.

1 (based on the average of the high and low stock price for the year ending December  
2 31, 2020).<sup>47</sup>

3 **Q43. Are there fundamental concerns with the retention growth rate calculation**  
4 **that Mr. Rothschild has relied on?**

5 A43. Yes. The retention growth rate calculation assumes that future earnings will  
6 increase as the retention ratio (i.e., the portion of earnings not paid out in dividends)  
7 increases. As Mr. Rothschild noted:

8 The primary cause of sustainable earnings growth is the retention of  
9 earnings. A company is able to create higher future earnings by  
10 retaining a portion of the prior year's earnings in the business and  
11 purchasing new business assets with those retained earnings.<sup>48</sup>

12 Although there are a few reasons why this assumption may not hold. For example,  
13 management may decide to either: a) conserve cash for capital investments; b)  
14 manage the dividend payout for the purpose of minimizing future dividend  
15 reductions; or c) signal future earnings prospects. These decisions can and do  
16 influence the dividend payout (and therefore earnings retention) in the near-term.

17 **Q44. Is there academic research that supports your conclusion?**

18 A44. Yes. In 2006, two articles were published in the *Financial Analysts Journal*, which  
19 discussed the theory that high dividend payouts (i.e., low retention ratios) are  
20 associated with low future earnings growth.<sup>49</sup> Each of those articles cited to a 2003

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<sup>47</sup> Rothschild Direct, at 42.

<sup>48</sup> *Id.*, at 76.

<sup>49</sup> Ping Zhou, William Ruland, *Dividend Payout and Future Earnings Growth*, Financial Analysts Journal, Vol. 62, No. 3, 2006. See also Owain ap Gwilym, James Seaton, Karina Suddason, Stephen Thomas, *International Evidence on the Payout Ratio, Earnings, Dividends and Returns*, Financial Analysts Journal, Vol. 62, No. 1, 2006.

1 study by Arnott and Asness<sup>50</sup> who found that, over the course of 130 years of data,  
2 future earnings growth is associated with high, rather than low payout ratios.<sup>51</sup>

3 Specifically, Arnott and Asness concluded:

4 Unlike optimistic new-paradigm advocates, we found that low  
5 payout ratios (high retention rates) historically precede low earnings  
6 growth. This relationship is statistically strong and robust. We found  
7 that the empirical facts conform to a world in which managers  
8 possess private information that causes them to pay out a large share  
9 of earnings when they are optimistic that dividend cuts will not be  
10 necessary and to pay out a small share when they are pessimistic,  
11 perhaps so that they can be confident of maintaining the dividend  
12 payouts. Alternatively, the facts also fit a world in which low payout  
13 ratios lead to, or come with, inefficient empire building and the  
14 funding of less than-ideal projects and investments, leading to poor  
15 subsequent growth, whereas high payout ratios lead to more  
16 carefully chosen projects. The empire-building story also fits the  
17 initial macroeconomic evidence quite well. At this point, these  
18 explanations are conjectures; more work on discriminating among  
19 competing stories is appropriate.<sup>52</sup>

20 Therefore, all three studies found that there is a negative, not a positive, relationship  
21 between earnings growth rates and retention ratios. As such, I do not believe Mr.  
22 Rothschild's reliance on retention growth rates in the Constant Growth DCF model  
23 is appropriate.

24 **Q45. Do you have other concerns regarding Mr. Rothschild's retention growth**  
25 **rates?**

26 A45. Yes. I have several additional concerns with Mr. Rothschild's reliance on retention  
27 growth rates in his Constant Growth DCF model. First, the use of the retention

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<sup>50</sup> Robert Arnott, Clifford Asness, *Surprise: Higher Dividends = Higher Earnings Growth*, Financial Analysts Journal, Vol. 59, No. 1, January/February 2003.

<sup>51</sup> Since the payout ratio is the inverse of the retention ratio, the authors found that future earnings growth is negatively related to the retention ratio.

<sup>52</sup> Robert Arnott, Clifford Asness, *Surprise: Higher Dividends = Higher Earnings Growth*, Financial Analysts Journal, Vol. 59, No. 1, January/February 2003.

1 growth rates involves estimating investor expectations for four separate variables  
2 over the near-term (i.e., the retention ratio (b), expected return on book equity (r),  
3 growth in the number of shares of common equity (s) and the portion of the market  
4 -to-book (M/B) ratio that exceeds unity (v)) which means that the growth estimate  
5 includes the forecasting error of the four separate variables. It is reasonable to  
6 assume the error associated with forecasting four separate variables to estimate  
7 growth is greater than the forecast error associated with developing a direct estimate  
8 of the growth rate similar to my use of earnings growth rates.

9 Second, Mr. Rothschild's retention growth rates require an estimate of the earned  
10 return on common equity and are therefore somewhat circular. For his gas proxy  
11 group, the projected earned return on common equity is the expected return on book  
12 value and is exactly what the regulatory commissions are determining when they  
13 set the allowed ROE for a company. As shown in Schedule ALR-3, page 1, Mr.  
14 Rothschild has determined that the earned return on common equity for his gas  
15 proxy group is 10.00 percent based on estimates from Value Line and Zacks.  
16 However, the resulting retention growth rates produce Constant Growth DCF  
17 estimates of 9.54 percent (based on the average of the high and low stock price for  
18 the year ending December 31, 2020) and 9.48 percent (using a spot stock price on  
19 December 31, 2020).<sup>53</sup> Therefore, Mr. Rothschild's Constant Growth DCF results  
20 are inconsistent with the expected earned return on equity he has assumed to  
21 calculate his growth rate. A natural gas utility could not earn a return on book  
22 equity of 10.00 percent if the ROE authorized was between 9.48 percent and 9.54

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<sup>53</sup> Schedule ALR-3, at 1.

1 percent. In summary, the return estimates produced by Mr. Rothschild's Constant  
2 Growth DCF analysis are approximately 46 to 52 basis points below the expected  
3 earned ROE of 10.00 percent that Mr. Rothschild has assumed for his proxy group  
4 companies.

5 Finally, as discussed in more detail below, the use of retention growth rates ignores  
6 the academic research demonstrating that EPS growth rates are most relevant in  
7 stock price valuation.<sup>54</sup>

8 **Q46. Do you have any additional comments on Mr. Rothschild's Constant Growth**  
9 **DCF analysis?**

10 A46. Yes. While Mr. Rothschild's use of retention growth rates in the Constant Growth  
11 DCF model results in an estimate of growth that is approximately 80 to 100 basis  
12 points below the proxy group average growth rate I relied on, it is not the only  
13 reason the results of Mr. Rothschild's Constant Growth DCF model are  
14 understated. The other reason that Mr. Rothschild's Constant Growth DCF model  
15 is producing a lower ROE estimate than my own is the dividend yields for the gas  
16 utilities, which are below historical averages due to the current high valuation of  
17 gas utilities. Mr. Rothschild acknowledges that P/E ratios for the gas proxy group  
18 companies are high by historical standards.<sup>55</sup> What he fails to recognize is that the

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<sup>54</sup> See Robert S. Harris, Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return, *Financial Management*, Spring 1986, at 66; James H. Vander Weide, Willard T. Carleton, Investor growth expectations: Analysts vs. history, *The Journal of Portfolio Management*, Spring, 1988; Robert S. Harris, Felicia C. Marston, Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts, *Financial Management*, Summer, 1992; Advanced Research Center, Investor Growth Expectations, Summer, 2004; The Risk Premium Approach to Measuring a Utility's Cost of Equity, *Financial Management*, Spring, 1985; Dr. Roger A. Morin, *New Regulatory Finance*, Public Utilities Reports, Inc. (2006) pp. 299-303.

<sup>55</sup> Rothschild Direct, at 20.

1 high stock valuations are causing the dividend yields for the gas proxy group  
2 companies to be low. Further as noted in Section III, utilities are expected to  
3 underperform relative to the broader market over the near-term as the economy  
4 recovers from COVID-19; thus, investors do not expect the current valuations to be  
5 maintained in the future. As a result, estimates of the DCF model which rely on  
6 current averages of share prices will likely understate the cost of equity during the  
7 period that Montana-Dakota's rates will be in effect.

8 **Q47. How do you respond to Mr. Rothschild's criticism that you only relied on EPS**  
9 **growth rates in the DCF model?**

10 A47. As explained in my Prepared Direct Testimony, earnings are the fundamental driver  
11 of a company's ability to pay dividends; therefore, earnings growth is the  
12 appropriate measure of a company's long-term growth.<sup>56</sup> As noted by Brigham and  
13 Houston:

14 Growth in dividends occurs primarily as a result of growth in  
15 earnings per share (EPS). Earnings growth, in turn, results from a  
16 number of factors, including (1) inflation, (2) the amount of earnings  
17 the company retains and invests, and (3) the rate of return the  
18 company earns on its equity (ROE).<sup>57</sup>

19 In contrast, changes in a company's dividend payments are based on management  
20 decisions related to cash management and other factors. For example, a company  
21 may decide to retain certain earnings rather than include those earnings in a

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<sup>56</sup> Bulkley Prepared Direct, at 41.

<sup>57</sup> Eugene F. Brigham and Joel F. Houston, *Fundamentals of Financial Management*, at 317 (Concise Fourth Edition, Thomson South-Western, 2004).

1 dividend issuance. Therefore, dividend growth rates are less likely than earnings  
2 growth rates to reflect investor perceptions of a company's growth prospects.

3 Furthermore, investment analysts report predominant reliance on EPS growth  
4 projections. In a survey completed by 297 members of the Association for  
5 Investment Management and Research, the majority of respondents ranked  
6 earnings as the most important variable in valuing a security (more important than  
7 cash flow, dividends, or book value).<sup>58</sup>

8 Academic research also supports the use of EPS growth estimates. A 2002 study  
9 in the *Journal of Accounting Research*, examined "the valuation performance of a  
10 comprehensive list of value drivers" and found that "forward earnings explain stock  
11 prices remarkably well" and were generally superior to other value drivers  
12 analyzed.<sup>59</sup> A 2012 study from the journal *Contemporary Accounting Research*  
13 found that the sell-side analysts with the most accurate stock price targets were  
14 those whom the researchers found to have more accurate earnings forecasts.<sup>60</sup>

15 **Q48. Mr. Rothschild contends that analysts' earnings growth rate estimates are**  
16 **over-optimistic.<sup>61</sup> Do you agree?**

17 A48. No, I do not. The 2003 Global Analysts Research Settlement (the "Global  
18 Settlement") served to significantly reduce the bias referred to by Mr. Rothschild.  
19 The Global Settlement required financial institutions to insulate investment

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<sup>58</sup> Block, Stanley B., "A Study of Financial Analysts: Practice and Theory", *Financial Analysts Journal* (July/August 1999).

<sup>59</sup> Liu, Jing, et al., "Equity Valuation Using Multiples," *Journal of Accounting Research*, Vol. 40 No. 1, March 2002.

<sup>60</sup> Gleason, C.A., et al., "Valuation Model Use and the Price Target Performance of Sell-Side Equity Analysts," *Contemporary Accounting Research*.

<sup>61</sup> Rothschild Direct, at 42.

1 banking from analysis, prohibited analysts from participating in “road shows,” and  
2 required the settling financial institutions to fund independent third-party research.  
3 In addition, analysts covering the common stock of the proxy companies certify  
4 that their analyses and recommendations are not related, either directly or  
5 indirectly, to their compensation.

6 A 2010 article in *Financial Analysts Journal* found that analyst forecast bias  
7 declined significantly or disappeared entirely since the Global Settlement:

8 Introduced in 2002, the Global Settlement and related regulations  
9 had an even bigger impact than Reg FD on analyst behavior. After  
10 the Global Settlement, the mean forecast bias declined significantly,  
11 whereas the median forecast bias essentially disappeared. Although  
12 disentangling the impact of the Global Settlement from that or  
13 related rules and regulations aimed at mitigating analysts’ conflicts  
14 of interest is impossible, forecast bias clearly declined around the  
15 time the Global Settlement was announced. These results suggest  
16 that the recent efforts of regulators have helped neutralize analysts’  
17 conflicts of interest.<sup>62</sup>

18 **Q49. Do you agree with Mr. Rothschild that earnings growth rates are a “poor**  
19 **indicator” of dividend growth over the near-term?**<sup>63</sup>

20 A49. No, I do not. Mr. Rothschild states that earnings growth rates are a poor predictor  
21 of dividend growth over the near-term because a company will not decrease its  
22 dividend just because a company’s earnings were below expectations for one  
23 year.<sup>64</sup> However, as discussed above, dividends may be directly affected by short  
24 run management decisions. For example, as a result of the economic effects of

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<sup>62</sup> Armen Hovakimian and Ekkachai Saenyasiri, *Conflicts of Interest and Analyst Behavior: Evidence from Recent Changes in Regulation*, *Financial Analysts Journal*, Volume 66, Number 4, July/August 2010, at 195.

<sup>63</sup> Rothschild Direct, at 79.

<sup>64</sup> *Ibid.*

1 COVID-19, more than forty S&P 500 companies have temporarily suspended their  
2 dividends.<sup>65</sup> These dividend suspensions occurred because Companies believed  
3 earnings over the short-term would decline and therefore, elected to conserve cash  
4 to offset the financial effects of COVID-19. Counter to the assumption of Mr.  
5 Rothschild, a company's management will alter dividend policy to respond to  
6 changes in earnings.

7 **Q50. Do you have any other observations regarding Mr. Rothschild's critique of**  
8 **earnings growth rates?**

9 A50. Yes. Mr. Rothschild states the following regarding the use of earnings growth rates:

10 While they are not useful if used in their "raw" form, they can be  
11 very useful in computing estimates of what earned return on equity  
12 investors expect will be sustained in the future, and as such, are  
13 useful in developing long-term sustainable growth rates.<sup>66</sup>

14 Therefore, Mr. Rothschild admits that investors rely on earnings growth rates to  
15 determine their expected earned return.

16 **Q51. Have you revised Mr. Rothschild's Constant Growth DCF analysis to rely on**  
17 **earnings growth rate projections?**

18 A51. Yes. I have modified Mr. Rothschild's Constant Growth DCF analysis to rely on  
19 earnings growth rate projections from Zacks, Yahoo! and Value Line similar to the  
20 growth rates that I relied on to calculate my Constant Growth DCF model. As  
21 shown in Exhibit No. \_\_\_\_ (AEB-4), Schedule 9, Mr. Rothschild's Constant Growth  
22 DCF result based on the average of the high and low stock price for the year ending

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<sup>65</sup> Langley, Karen, Wall Street Journal. "U.S. Companies Slashed Dividends at Fastest Pace in More Than a Decade", July 8, 2020.

<sup>66</sup> Rothschild Direct, at 80.

1 December 31, 2020 would increase by 71 basis points from 9.54 percent to 10.25  
2 percent, while his Constant Growth DCF based on spot stock prices as of December  
3 31, 2020 would increase by 98 basis points from 9.48 percent to 10.46 percent.  
4 These adjusted results demonstrate that Mr. Rothschild's use of a retention growth  
5 rate understates the results produced by the Constant Growth DCF model.

6 **Q52. Please summarize your conclusions regarding Mr. Rothschild's Constant**  
7 **Growth DCF analysis.**

8 A52. First, although he acknowledges the current high valuations for his natural gas  
9 proxy group companies, Mr. Rothschild does not consider whether it is reasonable  
10 to assume that these high valuations will continue into perpetuity. Second, Mr.  
11 Rothschild should have relied on EPS growth rates instead of retention growth rates  
12 in his Constant Growth DCF analysis. As noted above, if Mr. Rothschild had relied  
13 on EPS growth rates, the range of his Constant Growth DCF results would have  
14 increased to 10.25 percent to 10.46 percent. Thus, these revised results, along with  
15 the other correctly specified ROE estimation methodologies, market conditions and  
16 company-specific risk factors, provide a more appropriate representation of  
17 investor-expected returns for the Company.

18 **C. Non-Constant Growth DCF Analysis**

19 **Q53. Please summarize Mr. Rothschild's Non-Constant Growth DCF analysis.**

20 A53. Mr. Rothschild also presents a Non-Constant Growth DCF analysis, which is based  
21 on projected capital appreciation, forecasted dividends per share, and projected  
22 book values for his natural gas proxy group as reported by Value Line. The Non-

1 Constant Growth DCF analysis produces proxy group average ROE results of 10.71  
2 percent (based on spot stock prices as of December 31, 2020) and 11.45 percent  
3 (based on the average of the high and low stock price for the year ending December  
4 31, 2020).<sup>67</sup>

5 **Q54. Please comment on Mr. Rothschild's Non-Constant Growth DCF analysis.**

6 A54. As I discussed in my response to Data Request Staff 7.1, the utility industry is  
7 considered a mature industry due to its regulated status and relatively stable  
8 demand. Thus, financial projections such as earnings growth rate projections are  
9 also likely to be relatively stable over the long-term. The relative stability of the  
10 financial forecasts for utilities supports the use of a Constant Growth DCF model  
11 to estimate the cost of equity for a mature industry like utilities. Therefore, I believe  
12 the Constant Growth DCF model is the more appropriate model to estimate the cost  
13 of equity for Montana-Dakota than the Non-Constant Growth DCF analysis relied  
14 on by Mr. Rothschild. However, while I disagree with Mr. Rothschild's  
15 specification of the Non-Constant Growth DCF analysis, the results range from  
16 10.71 percent to 11.45 percent which provides greater support for my ROE  
17 recommendation of 9.80 percent for Montana-Dakota than Mr. Rothschild's

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<sup>67</sup> *Id.*, at 43-44.

1 recommendation of 8.09 percent. Therefore, to limit the contested issues, I will not  
2 address Mr. Rothschild's specification of this model.

3 **D. CAPM Analysis**

4 **Q55. Please summarize the results of Mr. Rothschild's CAPM analysis.**

5 A55. Mr. Rothschild calculates his CAPM using the spot yields for the 3-month U.S.  
6 Treasury Bill and the 30-year Treasury Bond as of December 31, 2020 and  
7 weighted averages over the three months ending on that date for both yields.<sup>68</sup> Mr.  
8 Rothschild utilizes a forward and hybrid Beta. The forward Beta is an option-  
9 implied beta calculated using options data for each of the companies in his gas  
10 proxy group and the S&P 500. The hybrid Beta is a weighted Beta calculation  
11 where Mr. Rothschild weights his forward Beta with historical Betas that are  
12 calculated using data for historical periods of six months, two years and five  
13 years.<sup>69</sup> Mr. Rothschild calculates both a spot (as of December 31, 2020) and  
14 weighted (i.e., three months as of December 31, 2020) forward and hybrid Beta.  
15 For the market risk premium, Mr. Rothschild calculates his expected return on the  
16 S&P 500 using stock options and the same methodology he used to calculate his  
17 option-implied beta. He approximates the expected growth for the S&P 500 using  
18 a cumulative probability of 50 percent which he indicates is the median of his  
19 probability distribution and represent an "option-implied market consensus"  
20 regarding the growth in the S&P 500.<sup>70</sup> Mr. Rothschild calculates both a weighted

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<sup>68</sup> *Id.*, at 51.

<sup>69</sup> *Id.*, at 57.

<sup>70</sup> *Id.*, at 66.

1 (i.e., three months as of December 31, 2020) and spot (as of December 31, 2020)  
 2 risk premium.<sup>71</sup> Mr. Rothschild’s CAPM analysis produces cost of equity estimates  
 3 ranging from 6.61 percent to 7.43 percent using the weighted risk premium and  
 4 Betas and 7.05 percent to 7.80 percent using the spot risk premium and Betas.<sup>72</sup>

5 **Q56. How do you respond to Mr. Rothschild’s claim that his CAPM has been**  
 6 **“recognized by other commissions”?**<sup>73</sup>

7 A56. Mr. Rothschild references a decision by the South Carolina Public Service  
 8 Commission (“SCPSC”) for Blue Granite Water Company (“Blue Granite”) in  
 9 Docket No. 2019-290-WS where he claims the SCPSC adopted his recommended  
 10 ROE of 7.46 percent because of his approach which reflects both historical and  
 11 forward-looking inputs.<sup>74</sup> The cite to this decision is problematic for several  
 12 reasons. First, Blue Granite is currently appealing the SCPSC’s decision in the case  
 13 with the South Carolina Supreme Court in Appellate Case No. 2020-001283. The  
 14 South Carolina Supreme Court has not issued a decision in the appeal case and  
 15 therefore, it is not appropriate to conclude that the authorized ROE for Blue Granite  
 16 is 7.46 percent. Second, the referenced authorized ROE should not be considered  
 17 comparable because the ROE authorized by the SCPSC takes into consideration  
 18 service quality issues. Mr. Rothschild confirmed this understanding in his response  
 19 to Montana-Dakota DR to Advocacy Staff 1.5 where he notes that the South  
 20 Carolina Public Service Commission considered “all of the evidence” in the case

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<sup>71</sup> *Id.*, at 65-66.

<sup>72</sup> *Id.*, at 69.

<sup>73</sup> *Id.*, at 11.

<sup>74</sup> *Ibid.*

1 when determining the ROE for Blue Granite which included concerns regarding  
2 service quality. Finally, Mr. Rothschild did not recommend an ROE of 7.46 percent  
3 for Blue Granite. Mr. Rothschild's recommended an ROE of 8.75 percent which  
4 was the high-end of his recommended range of 7.46 percent to 8.75 percent.<sup>75</sup> Mr.  
5 Rothschild selected the high-end of his range to account for the small size of Blue  
6 Granite, a risk factor Mr. Rothschild has chosen not to address for Montana-  
7 Dakota.<sup>76</sup> Therefore, it is clear the SCPSC selected the low-end of Mr. Rothschild's  
8 range to account for the Blue Granite's service quality issues. As a result, the  
9 Commission should not consider the SCPSC's decision in the rate case for Blue  
10 Granite in the determination of the ROE for Montana-Dakota.

#### 11 1. Risk-Free Rate

12 **Q57. Do you agree with the risk-free rates that Mr. Rothchild relied on in his CAPM**  
13 **analyses?**

14 A57. No. I do not agree with Mr. Rothschild's reliance on the spot and historical average  
15 Treasury bill and bond yields. As discussed in Section III of my Prepared Rebuttal  
16 Testimony, volatility in the stock and bond markets has been at elevated levels since  
17 mid-February 2020 in response to investor uncertainty regarding the economic  
18 effects of the COVID-19 pandemic. Investors have responded to both positive and  
19 negative developments regarding the COVID-19 pandemic and the policy response  
20 of the Federal Reserve and the U.S. Congress. The use of spot market data subjects  
21 any analysis to over or understating the ROE based on the relative position of the

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<sup>75</sup> Docket No. 2019-290-WS, Direct Testimony of Aaron L. Rothschild, January 23, 2020, at 7.

<sup>76</sup> *Ibid.*

1 market on the date that the underlying data was accessed. It is for this reason that  
2 the majority of analysts and Commissions rely on an average of utility stock prices  
3 over some time period to ensure that one or two unusual data points cannot bias the  
4 results of the analysis. While an average is the preferred to a spot yield, it is  
5 important to note that the substantial increase in volatility demonstrated in Figure  
6 4 above could also affect the 3-month average Treasury bill and bond yields that  
7 Mr. Rothschild has included in his CAPM analysis.

8 Furthermore, the cost of equity is being estimated for the forward-looking period  
9 when the Company's rates will be in effect. Therefore, it is equally important that  
10 the risk-free rate be reflective of the expected risk-free rate during the Company's  
11 rate period. As discussed in Section III of my Prepared Rebuttal Testimony,  
12 investors are expecting the economy to enter the early expansion phase of the  
13 business cycle, which means government bond yields should increase over the near-  
14 term. In fact, interest rates have increased further in the month since Mr.  
15 Rothschild's CAPM analysis was developed. For example, as of January 31, 2021,  
16 Mr. Rothschild's spot 30-year Treasury Bond yield would have increased from 1.65  
17 percent to 1.87 percent while his 3-month average 30-year Treasury Bond yield  
18 would have increased from 1.63 percent to 1.72 percent.<sup>77</sup> Therefore, I believe it  
19 is more appropriate to rely on forward-looking interest rates that are expected to  
20 prevail during the period that the Company's rates will be in effect.

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<sup>77</sup> Source: Bloomberg Professional.

1 **Q58. Does Mr. Rothschild agree that the use of projected Treasury bond yields is**  
2 **appropriate in the CAPM?**

3 A58. No. Mr. Rothschild argues that current bond yields reflect investor expectations so  
4 there is no need to use forecasts and questions the accuracy of forecasts.  
5 Furthermore, Mr. Rothchild suggests that the projected interest rates that I relied  
6 on, which were published by the Blue Chip Financial Forecast are “based primarily  
7 on economist published projections and not investors’ expectations as indicated by  
8 current market yields”.<sup>78</sup> According to Mr. Rothschild, if investors believed that  
9 interest rates were going to increase, the price of the bond would decline  
10 immediately until the expected interest rate was achieved.<sup>79</sup> Thus, it is Mr.  
11 Rothschild’s position that current interest rates are superior to forecasted bond  
12 yields for the purpose of estimating the risk-free rate.

13 **Q59. Have you reviewed the Congressional Budget Office (“CBO”) study cited by**  
14 **Mr. Rothschild, which examined the potential bias in the interest rate**  
15 **projections by Blue Chip?**

16 A59. Yes, I have. Based on my review, I concluded that Mr. Rothschild misrepresented  
17 the conclusions of the article published by the CBO in 2017. In the article, the CBO  
18 evaluated the forecast accuracy of Blue Chip’s interest rate forecasts to three yield  
19 curve models and three benchmark models, including the random walk model  
20 which is Mr. Rothschild’s preferred approach and assumes current interest rates  
21 will exist over the near-term. The models were evaluated for accuracy using data

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<sup>78</sup> Rothschild Direct, at 53 and 83.

<sup>79</sup> *Id.*, at 83.

1 for the period of 1984 through 2012, a period which the CBO noted was reflective  
2 of a long-term downward trend in interest rates. The CBO noted the following  
3 results:

4 For the full sample of 57 forecasts, the Blue Chip consensus was  
5 generally as accurate (or more accurate) than the forecasts produced  
6 by the yield-curve methods—VAR, EH, and EHTP (see Table 3).  
7 Compared with the benchmark methods, the Blue Chip consensus  
8 forecasts were also consistently more accurate than those based on  
9 the ARMA model. The RW and ARMA models produced smaller  
10 RMSEs than the Blue Chip consensus at the longer forecast horizons  
11 (years 3 through 5), but the differences were not statistically  
12 significant. Using the Blue Chip consensus forecast of nominal GDP  
13 growth in place of the interest rate forecast would have produced a  
14 (significantly) smaller RMSE at the 5-year-ahead horizon.<sup>80</sup>

15 Thus, according to the CBO, the differences between the forecasts of Blue Chip  
16 and the random walk model were not statistically different over the period analyzed  
17 of 1984 through 2012. Additionally, the CBO noted following regarding the  
18 applicability of the study:

19 And, finally, it is important to note that the forecast evaluations in  
20 this analysis covered a period when long-term interest rates trended  
21 downward, on average. It is not necessarily the case that the most  
22 accurate forecast models in a period of persistently falling interest  
23 rates will also be the most accurate when interest rates are no longer  
24 consistently falling.<sup>81</sup>

25 This is an important point given that long-term interest rates have been at historical  
26 lows but as discussed above have started to increase. The results of the study  
27 examined a declining interest rate environment the results of which may not be

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<sup>80</sup> Did Treasury Debt Markets Anticipate the Persistent Decline in Long-Term Interest Rates?, Congressional Budget Office, Edward N. Gamber, page 2. This paper can be found at: <https://www.cbo.gov/system/files/115th-congress-2017-2018/workingpaper/53153-interestrateswp.pdf>

<sup>81</sup> *Ibid.*

1 applicable to a rising interest rate environment. Therefore, Mr. Rothschild's  
2 conclusion that the forecasts provided by Blue Chip are significantly biased  
3 misrepresents the findings of the CBO's study.

4 **Q60. Have you reviewed any other studies which provide support for the use of**  
5 **forecast provided by Blue Chip?**

6 A60. Yes. A recent paper published in February 2020 by the Federal Reserve Bank of  
7 San Francisco compared the forecasts from Blue Chip and the Federal Reserve  
8 (Greenbook) for various economic indicators. The result was that the forecasts  
9 from Blue Chip had very similar accuracy as those produced by the Federal  
10 Reserve. Specifically, the authors noted that:

11 [M]arkets aggregate information, and there are very large, liquid  
12 markets in the U.S. that are closely tied to interest rate and inflation  
13 forecasts (such as nominal and real Treasury bonds and Treasury,  
14 interest rate, and inflation futures, options, and swaps), and these  
15 market prices are closely followed by private sector forecaster.<sup>82</sup>

16 Given that the Federal Reserve Bank is analyzing the private sector forecasts  
17 summarized by Blue Chip, it is clear that Blue Chip forecasts are highly regarded  
18 among economic and financial experts. In fact, the American Economic  
19 Association states that Blue Chip "may be the best known organization for  
20 consensus macro forecasts."<sup>83</sup> Finally, Secretary Mnuchin recently cited Blue  
21 Chip's macroeconomic forecasts in his statement before the House Committee on

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<sup>82</sup> Bauer, Michael D. and Swanson, Eric T., "The Fed's Response to Economic News Explains the 'Fed Information Effect'", Federal Reserve Bank of San Francisco, Working Paper Series, February 2020, Working Paper 2020-06, at 6, footnote 3.

<sup>83</sup> American Economic Association, "Resources for Economists on the Internet", Blue Chip Economic Indicators, available here:[https://www.aeaweb.org/rfe/showRes.php?rfe\\_id=1922&cat\\_id=12](https://www.aeaweb.org/rfe/showRes.php?rfe_id=1922&cat_id=12).

1 Financial Services on June 30, 2020.<sup>84</sup> Therefore, the Blue Chip Financial Forecast  
2 is a well-respected source of projections that can and should be relied upon in the  
3 development of a forward-looking cost of equity.

4 **Q61. Does Mr. Rothschild also rely on forecasted market data in his ROE analysis?**

5 A61. Yes. Mr. Rothschild appears to have no objection to the use of forecasted data in  
6 his DCF analysis, where he developed sustainable retention growth rates based on  
7 projected data from Zacks and Value Line. Furthermore, as noted above, Mr.  
8 Rothschild calculates a forward Beta and forward market risk premium using  
9 options data, which he believes is reflective of investors' views regarding future  
10 returns.<sup>85</sup> It is unclear why Mr. Rothschild finds these inputs reasonable, and yet  
11 suggests that the use of projected Treasury bond yields, such as those available from  
12 Blue Chip Financial Forecasts, should not be considered.

13 **Q62. Do you have any other concerns with the risk-free rate relied on by Mr.**  
14 **Rothschild?**

15 A62. Yes. I do not agree with Mr. Rothschild's reliance on the yield on the 3-month  
16 Treasury Bill because he believes that Treasury Bills have "relatively low exposure  
17 to swings in the overall market".<sup>86</sup> In determining the security most relevant to the

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<sup>84</sup> U.S. Department of the Treasury, Statement of Secretary Steven T. Mnuchin Before the House Committee on Financial Services, June 30, 2020.

<sup>85</sup> Rothschild Direct, at 54.

<sup>86</sup> *Id.*, at 51.

1 application of the CAPM, it is important to select the term (or maturity) that best  
2 matches the life of the underlying investment. As noted by Morningstar:

3 The traditional thinking regarding the time horizon of the chosen  
4 Treasury security is that it should match the time horizon of  
5 whatever is being valued... Note that the horizon is a function of  
6 the investment, not the investor. If an investor plans to hold stock  
7 in a company for only five years, the yield on a five-year Treasury  
8 note would not be appropriate since the company will continue to  
9 exist beyond those five years.<sup>87</sup>

10 Because electric, natural gas and water utility assets represent long-duration  
11 investments, it is appropriate to use yields on long-term Treasury bonds as the risk-  
12 free rate component of the CAPM. The 30-year Treasury bond is the appropriate  
13 security for that purpose.

14 **Q63. What is your response to Mr. Rothschild's contention that it is also important**  
15 **to consider the 3-month Treasury bill as the estimate of the risk-free rate**  
16 **because the 30-year Treasury bond "has an established non-zero beta"?**<sup>88</sup>

17 A63. Mr. Rothschild asserts that the Beta for the 30-year Treasury Bond is greater than  
18 the Beta of the 3-month Treasury Bill; however, he provides no analytical support  
19 to support this assertion.

## 20 2. Beta

21 **Q64. Please summarize the Beta coefficients relied on by Mr. Rothschild.**

22 A64. Mr. Rothschild utilizes a forward and hybrid Beta to calculate his CAPM analysis.  
23 The forward Beta is an option-implied Beta calculated using options data for each  
24 of the companies in his natural gas proxy group and the S&P 500. The hybrid Beta

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<sup>87</sup> Morningstar Inc., Ibbotson SBBI 2013 Valuation Yearbook, at 44.

<sup>88</sup> Rothschild Direct, at 52.

1 is a weighted Beta calculation where Mr. Rothschild weights his forward Beta with  
2 historical Betas that are calculated using data for historical periods of six months,  
3 two years and five years. Mr. Rothschild emphasizes the importance of his forward  
4 Beta based on options data because he contends that this Beta calculation is  
5 reflective of investors' views regarding future returns. Moreover, Mr. Rothschild  
6 cites to an academic journal article as support for his conclusion that option-implied  
7 Betas "provide information regarding future perceived risks and expectations".<sup>89</sup>

8 **Q65. What is your concern with the Beta coefficients that Mr. Rothschild has relied**  
9 **on?**

10 A65. I have several concerns with the Beta coefficients that Mr. Rothschild has relied on  
11 to develop his CAPM analysis. First, in the calculation of the option-implied betas,  
12 Mr. Rothschild has relied on options data for a single trading day, and he has only  
13 considered options contracts with an expiration date of 180 days in the future.<sup>90</sup>  
14 The use of spot market data leaves Mr. Rothchild's analysis subject to the volatility  
15 in the market. As shown in Figure 4 above, the date of the spot market data could  
16 affect the results of the analysis very significantly in a volatile market.

17 Second, in his calculation of the hybrid Beta, Mr. Rothschild places 50 percent of  
18 the weight on historical Betas calculated using market data for the past 6 months,  
19 two years and five years. Specifically, Mr. Rothschild places 25 percent weight on  
20 his 6-month Beta, 15 percent weight on his two-year Betas and 10 percent on his  
21 five-year Betas. Therefore, of the historical Betas that Mr. Rothschild relies on, he

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<sup>89</sup> *Id.*, at 56.

<sup>90</sup> *Id.*, at 59-60.

1 places greatest weight on the Beta calculated using 6-months of market data.  
2 However, a Beta calculated using 6 months of weekly data would only contain 26  
3 data points. The reduced number of data points in this analysis can result in  
4 regression results that are not statistically significant. Furthermore, there have been  
5 recent events such as the implementation of the TCJA, the trade dispute between  
6 the U.S. and China and the economic effects of COVID-19 which have resulted in  
7 dislocations in the market. These market dislocations will have a larger effect on  
8 Beta coefficients that are calculated using shorter time periods, such as the 6-month  
9 historical Beta that Mr. Rothschild has relied on. Therefore, reliance on the 6-  
10 month historical Beta may distort the Hybrid Beta that Mr. Rothchild relies on.

11 **Q66. How does the use of options contracts for a specific trading day affect Mr.**  
12 **Rothschild's calculation of his forward Beta coefficient?**

13 A66. As discussed in Section III of my Prepared Rebuttal Testimony, volatility in the  
14 stock and bond markets has been at elevated levels since mid-February 2020. The  
15 increased volatility is measured by the VIX index, which uses options contracts to  
16 measure investors' expectations of volatility in the S&P 500 over the next 30 days.  
17 The options contract data used to determine the VIX is the same data that Mr.  
18 Rothschild is relying on to develop his option-implied Beta. Since, as shown in  
19 Figure 4 of my Prepared Rebuttal Testimony, the VIX index can change drastically  
20 on a daily basis, it stands to reason that the individual day that Mr. Rothchild  
21 selected to determine the option-implied Beta could have a large effect on the  
22 forward Beta that is calculated. In fact, in an article referenced by Mr. Rothschild

1 as support for the use of option-implied Betas, Chang, Christoffersen, Jacobs and  
2 Vainberg noted:

3 We compute option-implied moments and betas using option prices  
4 on a given day. While this is the most obvious and transparent initial  
5 approach to investigating the method's merits, the performance of  
6 the option-implied betas may be improved by adjusting these betas  
7 using a predetermined rule, or by smoothing betas and/or moments  
8 using information extracted from option prices on other days. The  
9 optimal use and optimal smoothing of information contained in  
10 option prices is certainly worthy of further study.<sup>91</sup>

11 Therefore, the authors understood that relying on option contracts for a single day  
12 may not produce optimal results. The forward Beta calculations in Schedule ALR-  
13 4, page 3 provide further support for the significant effect of relying on market day  
14 for a single day. As shown on page 3 of Schedule ALR-4, the option implied Beta  
15 was 0.65 on September 29, 2020, while it was 0.29 on October 6, 2020. A  
16 difference of one week resulted in a decrease in the option-implied Beta of 0.36,  
17 demonstrating that the use of such data based on spot market data is speculative.

18 **Q67. Does Mr. Rothschild rely only on the spot option-implied Beta as his estimate**  
19 **of the forward Beta?**

20 A67. No. Mr. Rothschild relies on two forward-looking estimates of Beta, the spot  
21 option-implied Beta is used to calculate his spot CAPM analysis. In addition, he  
22 relies on a three-month average weekly option-implied Betas, calculated over the

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<sup>91</sup> Bo-Young Chang & Peter Christoffersen & Kris Jacobs & Gregory Vainberg. (2011) Option-Implied Measures of Equity Risk, Review of Finance 16: 385-428.

1 period from September 29, 2020 to December 29, 2020 to calculate his weighted  
2 CAPM analysis.<sup>92</sup>

3 **Q68. What is the basis for Mr. Rothchild's average weekly option-implied Betas?**

4 A68. There appears to be no academic support for his calculation of the average option-  
5 implied Beta. Mr. Rothschild appears to use judgment in the selection of the three-  
6 month time period and the calculation of the three-month average of the weekly  
7 option-implied Betas, as it is not discussed by Chang, Christoffersen, Jacobs and  
8 Vainberg, nor does Mr. Rothschild provide any supporting documentation for the  
9 three-month average period in academic literature.

10 **Q69. Do you have any other concerns with Mr. Rothschild's option-implied Beta**  
11 **calculation?**

12 A69. Yes. Mr. Rothschild indicates that he has relied on options contracts that have an  
13 expiration date of six months. Therefore, the options contracts only reflect  
14 investors' views on Beta for the next six months. However, in the current  
15 proceeding, we are estimating the cost of equity for the period that Montana-  
16 Dakota's rates will be in effect. Since Mr. Rothschild's forward Beta is only based  
17 on options data for the next six months, this does not cover the period that Montana-  
18 Dakota's rates will be in effect. In fact, in another article referenced by Mr.  
19 Rothschild titled "Forward-Looking Betas", Christoffersen, Jacobs and Vainberg  
20 suggest that six months may not be the appropriate time-period to use when

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<sup>92</sup> Rothschild Direct, Schedule ALR-4, at 3.

1 estimating the cost of capital. Specifically, Christoffersen, Jacobs and Vainberg  
2 note that:

3 [T]he main focus in this paper has been on forecasting 180-day ex-  
4 post betas, which are relevant for certain applications such as  
5 abnormal returns. **For other applications, such as cost of capital**  
6 **calculations, longer-horizon betas may be needed.** We plan to  
7 investigate the performance of option implied betas in this context  
8 by using LEAPS as well as option contracts with longer maturities  
9 traded on non-U.S markets. Indeed, our option-implied beta  
10 approach allows for the computation of a complete term structure of  
11 beta for each company so long as the options data is available.<sup>93</sup>

12 Long-term equity anticipation securities (“LEAPS”) are option contracts with  
13 expiration dates of typically more than one year. In the current proceeding, we are  
14 estimating the cost of equity for Montana-Dakota; therefore, Mr. Rothschild should  
15 have used options contracts with an expiration date of one year or longer and not  
16 six months.

17 **Q70. Does Mr. Rothschild explain why he has not considered LEAPS in the**  
18 **estimation of his option-implied Beta?**

19 A70. Mr. Rothschild’s explanation for why he did not use LEAPS is that the options  
20 contracts are not traded for a number of the companies in his proxy group.<sup>94</sup> This  
21 admission by Mr. Rothschild is important for two reasons. First, this highlights the  
22 data limitations of using options contract data to estimate the Beta coefficient for  
23 utilities. If the options contract data for one or more of the utilities in his proxy  
24 group is limited this will have an effect on the Beta coefficient for that company  
25 and the proxy group average. Second, Christoffersen, Jacobs and Vainberg suggest

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<sup>93</sup> Peter Christoffersen, Kris Jacobs, and Gregory Vainberg, “Forward-Looking Betas”, April 25, 2008, at 24. (Emphasis added)

<sup>94</sup> Rothschild Direct, at 63.

1 that options contracts with expiration dates longer than six months may be needed  
2 to estimate the cost of capital.<sup>95</sup> Since contracts of this length are not available for  
3 utilities then an alternative approach such as the use of historical Betas should be  
4 used to estimate the cost of equity for utilities. It is not appropriate to use option  
5 contract data with expiration dates less than six months as Mr. Rothschild has if the  
6 authors believe the data is not appropriate for estimating the cost of equity.

7 **Q71. Do you agree with the approach Mr. Rothschild relies on to develop his**  
8 **historical Betas?**

9 A71. No, I do not. As I discussed above, recent events, such as the TCJA and COVID-  
10 19, have resulted in dislocations in the market. These market dislocations will have  
11 a larger effect on Beta coefficients that are calculated using short time periods.  
12 Furthermore, the shorter the time-period used to develop the regression analysis for  
13 Beta, the more likely the results will not be statistically significant. In developing  
14 his hybrid Beta, Mr. Rothschild considers historical Beta coefficients estimated  
15 using market data for six months, two year and five years. However, of the three  
16 historical estimates considered, he places greatest weight on his calculation of the  
17 six-month Beta. Given that a six-month Beta calculation contains so few data points  
18 and can be greatly affected by short-term changes in the market, Mr. Rothschild  
19 should have placed greater weight on the historical Betas calculated using two and

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<sup>95</sup> Peter Christoffersen, Kris Jacobs, and Gregory Vainberg, "Forward-Looking Betas", April 25, 2008, at 24.

1 five-years of market data because these regressions contain significantly more data  
2 points.

3 **Q72. Does Mr. Rothschild provide any analytical support for the relative weights of**  
4 **the forward and historical Betas that he used to calculate his hybrid Beta?**

5 A72. No, he does not. Mr. Rothchild claims that he placed greater weight on the option-  
6 implied Betas and the six-month historical Beta calculation because Christoffersen,  
7 Jacobs and Vainberg concluded that these calculations of Beta outperformed the  
8 one-year and five-year historical Beta calculations when predicting realized Betas  
9 at six-months, one-year and two-years into the future.<sup>96</sup> However, Mr. Rothschild  
10 fails to acknowledge that the results of their study depended entirely on how they  
11 estimated the realized Beta. Specifically, the authors noted:

12 The results from the three case studies encourage a full-scale  
13 investigation using the 30 Dow Jones components. However, they  
14 also illustrate that the realized beta computed over a relatively short  
15 period such as 180 days can produce questionable estimates of the  
16 true but unknown beta. This caveat is important when interpreting  
17 the results below. The three case studies also illustrate that the  
18 forward-looking betas contain a certain amount of high-frequency  
19 noise when estimated from only one day of options data. We could  
20 reduce this noise by estimating the forward-looking betas using  
21 several days of options. However, in order to be as transparent as  
22 possible all the forward looking betas below are estimated using just  
23 one day of options data.<sup>97</sup>

24 Christoffersen, Jacobs and Vainberg estimated the realized Beta over a period of  
25 only 180-days which the authors acknowledge could produce “questionable  
26 estimates” of the realized Beta.<sup>98</sup> In fact, for Exxon, the realized Beta was negative

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<sup>96</sup> Rothschild Direct, at 63.

<sup>97</sup> Peter Christoffersen, Kris Jacobs, and Gregory Vainberg, “Forward-Looking Betas”, April 25, 2008, at 14.

<sup>98</sup> *Ibid.*

1 in some instances which the authors acknowledged was “unrealistic” and  
2 “indicative of a problem with our proxy for the ex post realized beta”.<sup>99</sup>  
3 Furthermore, the authors only evaluated the performance of the various Beta  
4 calculations using the Dow Jones 30 which as shown in Table 1 of the report did  
5 not include any utility companies.<sup>100</sup> As a result, it is clear that Christoffersen,  
6 Jacobs and Vainberg acknowledge that much additional work needs to be  
7 completed to analyze to effectiveness of option-implied Betas as a stand-alone Beta  
8 estimate and when combined with historical estimates of Beta. Therefore, it is not  
9 appropriate to subject the estimation process of the cost of equity for Montana-  
10 Dakota to an experimental estimate of Beta which is highly variable.

11 **Q73. Do you agree with Mr. Rothschild that your historical Beta coefficients of five  
12 and ten-years result in an overstated cost of equity for Montana-Dakota?**

13 A73. No, I do not. Mr. Rothschild contends that the five and ten-year historical Beta  
14 coefficients that I rely on to calculate my CAPM analysis result in an overstated  
15 estimate of the cost of equity based on a comparison of my historical Beta  
16 coefficients to his option-implied Beta coefficient as of December 31, 2020.  
17 However, as discussed above, the process Mr. Rothschild uses to develop his  
18 option-implied Beta yields results that can change drastically based on the day that  
19 is used to estimate the Beta. For example, Mr. Rothschild calculated the option-  
20 implied beta for a specific day each week for the three-month period of October  
21 2020 through December 2020 which resulted in a range of option-implied Betas

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<sup>99</sup> *Ibid.*

<sup>100</sup> *Id.*, at 48.

1 from 0.29 to 0.75. This wide range shows the variability that can result from Mr.  
2 Rothschild's calculation in just a small time period of three weeks. Therefore, I do  
3 not believe Mr. Rothschild has conducted a meaningful comparison and thus has  
4 not provided any support that my Beta coefficients result in an overstated estimate  
5 of the cost of equity.

6 **Q74. What Beta coefficient should be relied on in the CAPM?**

7 A74. I continue to support the use of the average Beta coefficients for the proxy group  
8 companies as reported by Value Line and Bloomberg. The purpose of the CAPM  
9 analysis is to estimate the investor-required return on equity. As discussed in my  
10 Prepared Direct Testimony, I relied on Value Line and Bloomberg as the sources  
11 of the Betas in my analyses, both of which are reasonably accessible and  
12 consistently public Betas on the industry group. Therefore, it is reasonable to  
13 expect that investors would consider the Betas published by these sources. Value  
14 Line calculates the Beta coefficient for each company using five years of weekly  
15 returns relative to the New York Stock Exchange Composite Index, while  
16 Bloomberg's Beta coefficients were calculated using ten years of weekly returns  
17 relative to the S&P 500 Index. The estimation process employed by Bloomberg  
18 and Value Line produces more robust estimates of the Beta coefficient than Mr.

1           Rothschild’s use of options contracts for a single trading day or weekly market data  
2           for a six-month period.

3                           **3. Market Risk Premium**

4   **Q75. Please discuss the market risk premium used by Mr. Rothschild.**

5   A75. Similar to the process used to calculate his forward Beta, Mr. Rothschild calculates  
6           a weighted (i.e., three months as of December 31, 2020) and spot (as of December  
7           31, 2020) risk premium using options data for the S&P 500.<sup>101</sup> The weighted risk  
8           premium ranges from 9.05 percent (30-year Treasury Bond yield) to 10.59 percent  
9           (3-month Treasury Bond yield), while the spot risk premium ranges from 8.57  
10          percent (30-year Treasury Bond yield) to 10.13 percent (3-month Treasury Bond  
11          yield).<sup>102</sup>

12   **Q76. What is your concern with Mr. Rothschild’s market risk premium estimates?**

13   A76. Similar to Mr. Rothschild’s option-implied Betas, the weighted and spot risk  
14          premia that Mr. Rothschild relies on in his CAPM analysis are calculated using  
15          options contracts for the S&P 500. While Mr. Rothschild also includes options  
16          contracts that expire up to 35 months in the future, as opposed to six-months for his  
17          option-implied Beta calculations, his spot risk premium still relies on options  
18          contracts for a signal trading day, which can change considerably depending on the  
19          trading day that is used. In fact, as shown in Figure 7, since Mr. Rothschild has  
20          relied on options contract data, his market return calculation is highly dependent on  
21          the value of the VIX. For example, between October and November, the VIX

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<sup>101</sup> Rothschild Direct, at 65-66.

<sup>102</sup> *Id.*, at 66.

1 declined from 38.02 to 23.08 which resulted in a 175-basis point decline in Mr.  
 2 Rothschild's market return estimate. This relationship is important because as  
 3 shown in Figure 4, the VIX has been quite volatile over the past year as investors  
 4 have responded to news regarding the COVID-19 pandemic. This type of volatility  
 5 will result in large changes in the market return using Mr. Rothschild's estimation  
 6 process. It is not appropriate to estimate the cost of equity for Montana-Dakota  
 7 over the period that the Company's rates will be in effect using a calculation that  
 8 can vary greatly from day to day.

9 Additionally, as noted, Mr. Rothschild does calculate a weighted risk premium  
 10 based on the most recent three months. However, Mr. Rothschild appears to apply  
 11 his judgment in selecting the three-month period as he does not provide any  
 12 academic support or supporting analyses to show that a three-month average  
 13 produces more accurate estimates of the market return.

14 **Figure 7: Comparison of Mr. Rothschild's Market Return and the VIX**

Date	Market Return <sup>103</sup>	VIX <sup>104</sup>
10/30/2020	12.01%	38.02
11/24/2020	10.25%	21.64
12/29/2020	10.22%	23.08

15  
 16 **Q77. Do you have any additional concerns with the methodology that Mr.**  
 17 **Rothschild has used to estimate the market risk premium?**

18 **A77.** Yes, I do. While Mr. Rothchild has indicated that he relies on options contract data  
 19 to estimate the market risk premium, it appears that Mr. Rothschild has changed

<sup>103</sup> Response to DR 1.1, Attachment: 2020.12.31 - Montana-Dakota Cost of Capital (RFC Gas PG) – FINAL.

<sup>104</sup> Bloomberg Professional.

1           how he performs the calculation from previous cases where he has testified  
2           recently. For example, in September 2020, in Docket No. R-2020-3019369 for  
3           Pennsylvania-American Water Company (“PAWC), Mr. Rothschild also claims to  
4           have relied on options contract data to estimate his market return and thus his  
5           market risk premium.<sup>105</sup> In that case., Mr. Rothschild estimated a spot market return  
6           as of July 31, 2020 of 15.36 percent and a three-month weighted market return of  
7           as of July 31, 2020 of 16.41 percent.<sup>106</sup> However, the current case for Montana-  
8           Dakota in an attachment to DR. 1.1, Mr. Rothschild estimated a market return as of  
9           July 31, 2020 of 11.49 percent which is 492 basis points below the market return  
10          he estimated September 2020, only four months prior to the analysis relied on in  
11          the current case.<sup>107</sup> This example highlights why options contract data should not  
12          be used in the estimation of the cost of equity for utilities. While the methodology  
13          leads to results that vary greatly based on the date that it used, it appears that Mr.

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<sup>105</sup> Docket No. R-2020-3019369, Direct Testimony of Aaron L. Rothschild, September 8, 2020, at 55-57.

<sup>106</sup> *Id.*, at 58.

<sup>107</sup> Response to DR 1.1, Attachment: 2020.12.31 - Montana-Dakota Cost of Capital (RFC Gas PG) – FINAL.

1 Rothschild has changed methodology itself which results in very different estimates  
2 of the market return even if the same date is used.

3 **Q78. Has Mr. Rothschild acknowledged that there is not a specific approach to**  
4 **estimating the market return from the options contract data?**

5 A78. Yes. In Docket No. 2020-125-E on behalf of Consumer Affairs in a rate case for  
6 Dominion Energy South Carolina (“DESC”), Mr. Rothschild noted the following  
7 regarding the calculation of the market return using options contract data:

8           There is no confidence level that yields a “correct” answer for the  
9           expected growth rate since everything comes down to probabilities  
10          implied by option prices. But it is important to note that values on  
11          the tails of the probability function get increasingly separated,  
12          requiring an ever-increasing growth rate for every additional  
13          percentage in the confidence level, and making it impossible to ever  
14          arrive at 100%.<sup>108</sup>

15 In the rate case for DESC, Mr. Rothschild estimated the market return using a  
16 cumulative probability of 80 percent which resulted in an estimated market return  
17 of 12.92 percent.<sup>109</sup> According to Mr. Rothschild, an 80 percent cumulative  
18 probability means that investors believe there is only a 20 percent chance that the  
19 S&P 500 will grow at a higher rate than the growth rate Mr. Rothschild used to  
20 estimate the market return. In the current case for Montana-Dakota, Mr. Rothschild  
21 is using a cumulative probability of 50 percent which is much lower than the 80  
22 percent cumulative probability used in the rate case for DESC and implies that  
23 investors think there is 50 percent chance that the S&P 500 will grow at a rate  
24 higher than the growth rate relied on by Mr. Rothschild. The use of a lower

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<sup>108</sup> Docket No. 2020-125-E, Direct Testimony of Aaron L. Rothschild, November 10, 2020, at 65.

<sup>109</sup> *Id.*, at 66.

1 cumulative probability means that Mr. Rothschild's estimate of the market return  
2 is likely to be lower than his estimate of the market return in the rate case for DESC.  
3 Further, Mr. Rothchild criticizes my ROE recommendation of 10.20 percent  
4 because it would imply a cumulative probability of 61.1 percent for the market  
5 return; however, this is lower than the cumulative probability he used in the rate  
6 case for DESC.<sup>110</sup> Because there is not a consensus regarding the selection of the  
7 cumulative probability used to estimate the market return, Mr. Rothschild is able to  
8 arbitrarily select the probability used to estimate the market return. Mr.  
9 Rothschild's use of different probabilities from case to case is quite concerning  
10 because the selection can heavily influence the results of his CAPM analysis. As  
11 a result, I recommend the Commission place zero weight on the CAPM analysis  
12 developed by Mr. Rothschild in determining the authorized ROE for Montana-  
13 Dakota.

14 **Q79. What is Mr. Rothschild's concern with the MRP you have used in your CAPM**  
15 **analysis?**

16 A79. The MRP is estimated by calculating the total market return and deducting from  
17 that the risk-free rate. Mr. Rothschild criticizes the assumptions I have relied on to  
18 calculate the total market return, in particular, my use of the dividend yield and  
19 earnings growth forecast for the S&P 500. Mr. Rothschild contends that these are  
20 analyst forecasts that are not based on market data.<sup>111</sup> Instead, Mr. Rothschild  
21 contends it is more appropriate to rely on "investor expectations as revealed by

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<sup>110</sup> Rothschild Direct, at 68.

<sup>111</sup> *Id.*, at 82.

1 market data” which is achieved by calculating the market return using options  
2 contracts.<sup>112</sup> Mr. Rothschild also takes issue with my estimate of the market return  
3 of 13.95 percent since it is based on an earnings growth rate provided by S&P which  
4 Mr. Rothschild believes is overstated.<sup>113</sup>

5 **Q80. What is your response to Mr. Rothschild’s concerns about your forward-  
6 looking MRP?**

7 A80. It is unclear how Mr. Rothschild has concluded that my calculation of the market  
8 return is not market based. The forward-looking market return that is calculated in  
9 my CAPM analysis is developed using a DCF methodology. To develop the market  
10 return, I rely on a Constant Growth DCF model and use it to calculate the return on  
11 the S&P 500. As discussed in my Prepared Direct Testimony, I specifically rely  
12 on S&P’s published dividend yield and five-year projected growth rate for the  
13 entire S&P 500 Index.<sup>114</sup> This model is very similar to the Constant Growth DCF  
14 model that Mr. Rothschild relies on to develop his recommended ROE for  
15 Montana-Dakota. Therefore, it would stand to reason that if my Constant Growth  
16 DCF analysis of the S&P 500 is not market based then neither is the Constant  
17 Growth DCF analysis developed by Mr. Rothschild for his natural gas proxy group.  
18 Furthermore, Mr. Rothschild incorrectly assumes that I have relied on analyst  
19 forecasts of the S&P dividend yield. The dividend yield is the actual dividend yield  
20 for the S&P 500 as of July 31, 2020, which would be considered historical market  
21 data. While we disagree on the estimate of growth for the Constant Growth DCF (I

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<sup>112</sup> *Ibid.*

<sup>113</sup> *Id.*, at 6.

<sup>114</sup> Bulkley Prepared Direct, at 46.

1           rely on earnings growth, while Mr. Rothschild relies on a sustainable retention  
2           growth rate), both growth rates are based on projected data by analysts. As a result,  
3           it is unclear how Mr. Rothschild has concluded that my calculation of the market  
4           return is not market based.

5   **Q81. Have other regulators endorsed the calculation of the forward-looking market**  
6   **risk premium that is similar to the methodology you relied on?**

7   A81. Yes. The Minnesota Public Utilities Commission (“Minnesota PUC”) has also  
8   relied on the Constant Growth DCF model to estimate the market return. In Docket  
9   No. G-004/GR-19-511 for Great Plains Natural Gas Company, the Department of  
10   Commerce in Minnesota (“Minnesota DOC”) relied on a Constant Growth DCF  
11   analysis for the S&P 500 to estimate the market return for the CAPM. Specifically,  
12   the Minnesota DOC relied on the dividend yield reported by S&P for the S&P 500  
13   and the three-five year earnings growth estimate for the State Street Global  
14   Advisors S&P 500 exchange traded fund (“ETF”), which resulted in a market return  
15   of 13.44 percent.<sup>115</sup> The Minnesota DOC has historically relied on the Constant

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<sup>115</sup> Docket No. G-004/GR-19-511, In the Matter of the Petition By Great Plains Natural Gas Co., a Division of Montana-Dakota Utilities Co., for Authority to Increase Natural Gas Rates in Minnesota (March 3, 2020), at Ex. DER-9, CMA-S-8.

1 Growth DCF model to estimate the market return for the CAPM, which has in turn  
2 been considered by the Minnesota PUC in prior proceedings.<sup>116</sup>

3 **Q82. What is your response to Mr. Rothschild's criticism of your use of the earnings**  
4 **growth rate published by S&P to estimate the Constant Growth DCF model**  
5 **for the S&P 500?**

6 A82. Mr. Rothschild believes that it is inappropriate to rely on the earnings growth rate  
7 published by S&P because of an email exchange he had with S&P Global analyst  
8 Howard Silverblatt who indicated that caution should be used when relying on the  
9 S&P earnings growth rate.<sup>117</sup> First, it is important to note that Mr. Rothschild asked  
10 Mr. Silverblatt the following question:

11 Do you recommend using your earnings growth rate projection in a  
12 DCF model? In other words do you think it is reasonable to expect  
13 a 13.97% (12.42% growth + 1.55% dividend yield) return by  
14 investing in the S&P 500 over the long-term?

15 I am concerned that your 12.42% five-year forecast may not be  
16 appropriate to use in a constant growth DCF model because your  
17 forecast is for only a 5-year period, not in perpetuity. Given that  
18 we're coming out of this COVID mess it might be reasonable to  
19 expect that your 12.42% includes some short-term growth that could  
20 be lower in the long-term (longer than 5-years).<sup>118</sup>

21 Mr. Rothchild specifically asked if the earnings growth rate was appropriate to use  
22 in a Constant Growth DCF model. In his response while Mr. Silverblatt indicated  
23 caution should be used, he did not say it is not appropriate to use the earnings

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<sup>116</sup> See Docket No. E017/GR-15-1033, Findings of Fact, Conclusions and Order, May 1, 2017, at 54-56; and Docket No. E015/GR-16-664, Findings of Fact, Conclusions and Order, March 12, 2018, at 60-61.

<sup>117</sup> Rothschild Direct, at 6.

<sup>118</sup> Source: Advocacy Staff Set No. 1.4 - Email Exchange Between Mr. Rothschild and Howard Silverblatt.

1 growth rate published by S&P in a Constant Growth DCF model. Second, in this  
2 case we are trying to determine investors' expectations of the cost of equity during  
3 the period that Montana-Dakota's rates will be in effect. While investors understand  
4 that all forecasts should be used with caution, it is reasonable to assume that  
5 investors rely on the forecasts provided by S&P as well as other services such as  
6 Zacks and Value Line to develop their return expectations over the near-term since  
7 these forecasts are the best estimate of future market conditions. In fact, in the  
8 calculation of his Constant Growth DCF model, Mr. Rothschild relies on the  
9 forecasts of Zacks and Value Line to develop his retention growth estimate.

10 **Q83. Please comment on Mr. Rothschild's statement that your estimated market**  
11 **return is "off the charts high".<sup>119</sup>**

12 A83. Interestingly, Mr. Rothschild states that my market return estimate of 13.95 percent  
13 is too high; however, as noted above, in the recent rate case for PAWC in Docket  
14 No. R-2020-3019369, Mr. Rothschild relied on estimates of the market return that  
15 were as high as 16.41 percent.<sup>120</sup> Furthermore, given the range of annual equity  
16 returns that have been observed over the past century (shown in Figure 8), a current  
17 expected return of 13.95 percent is not unreasonable. In 47 out of the past 94 years  
18 (or roughly 50 percent of observations), the realized equity return was at least 13.95  
19 percent or greater. Furthermore, as shown in Figure 9, my estimate of the market  
20 return of 13.95 percent is well below the actual average market return for Large  
21 Company Stocks from 2009 to 2019 of 15.27 percent as reported by Duff & Phelps.

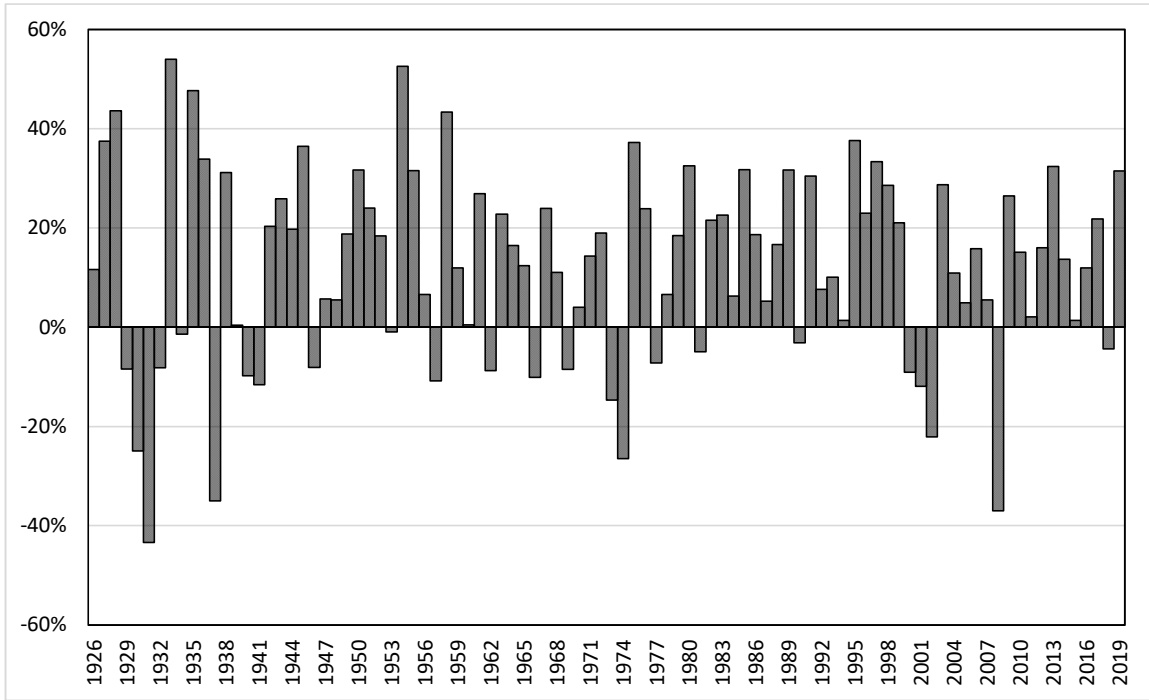
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<sup>119</sup> Rothschild Direct, at 6.

<sup>120</sup> Docket No. R-2020-3019369, Direct Testimony of Aaron L. Rothschild, September 8, 2020, at 58.

1 Therefore, my estimate of the market return is more than reasonable considering  
 2 the historical returns achieved by Large Company Stocks.

3 **Figure 8: Realized U.S. Equity Market Returns (1926-2019)<sup>121</sup>**



4

<sup>121</sup> Depicts total annual returns on large company stocks, as reported in the 2020 Duff and Phelps SBBI Yearbook.

1  
2  
3

**Figure 9: Duff and Phelps – Total Return for Large Company Stocks –  
2009-2019<sup>122</sup>**

<b>Year</b>	<b>Large Company Stock Total Return</b>
2009	26.46%
2010	15.06%
2011	2.11%
2012	16.00%
2013	32.39%
2014	13.69%
2015	1.38%
2016	11.96%
2017	21.83%
2018	-4.38%
2019	31.49%
<b>Average</b>	<b>15.27%</b>

4

5 **Q84. Have you adjusted Mr. Rothschild's CAPM analysis to reflect some of the**  
6 **changes you have discussed?**

7 A84. Yes. Specifically, I adjusted Mr. Rothschild's CAPM analysis to: (a) only rely on  
8 the 30-year Treasury Bond yield as the estimate of the risk-free rate; and (b) to rely  
9 on my estimate of the market return of 13.95 percent as shown in Exhibit  
10 No. \_\_\_\_ (AEB-2), Schedule 5.<sup>123</sup> As shown in Exhibit No. \_\_\_\_ (AEB-4), Schedule  
11 10, by making reasonable modifications to Mr. Rothschild's CAPM analysis, the

<sup>122</sup> Source: Duff and Phelps, Cost of Capital Navigator.

<sup>123</sup> While I also disagree with Mr. Rothschild's use of the historical average and spot 30-year Treasury Bond yield as the risk-free rate and the forward and hybrid Betas calculated using options contracts, the selection of the market return represents the most significant methodological difference in our CAPM analyses. Therefore, I have not calculated a revised version of Mr. Rothschild's CAPM analysis using projected interest rates and the two and five-year historical Beta coefficients.

1 ROE results range from 9.26 percent to 10.50 percent, which is a substantially  
2 higher range than the 6.61 percent to 7.80 percent range developed by Mr.  
3 Rothschild's CAPM Analysis. Furthermore, the adjusted results are: 1) consistent  
4 with the recently authorized ROEs for natural gas utilities as shown in Figure 2;  
5 and 2) closer to my recommended ROE for Montana-Dakota of 9.80 percent than  
6 Mr. Rothschild's recommendation of 8.09 percent.

7 **Q85. What are your conclusions regarding Mr. Rothschild's CAPM analysis?**

8 A85. Mr. Rothschild's CAPM analysis results in a range of ROE results from 6.61  
9 percent to 7.80 percent. Even the high-end of the range does not provide a risk  
10 premium sufficient to compensate investors for the additional risk of an equity  
11 investment. Further, there has never been an authorized ROE for a natural gas  
12 utility in the range estimated using Mr. Rothschild's CAPM approach. The flaws  
13 in Mr. Rothschild's CAPM are reliance on: (a) the yield on the 3-month Treasury  
14 Bill as an estimate of the risk-free rate; (b) the historical average and spot yield on  
15 both the 3-month Treasury Bill and the 30-year Treasury Bond; (c) consideration  
16 of the option-implied Beta coefficient and 6-month historical Beta coefficient; and  
17 (d) use of options contracts to estimate the market return. As shown in Exhibit  
18 No. \_\_\_\_ (AEB-4), Schedule-10, adjusting Mr. Rothschild's CAPM analysis to rely  
19 only on the 30-year Treasury Bond yield as the estimate of the risk-free rate and on  
20 my estimate of the market return of 13.95 percent as shown in Exhibit  
21 No. \_\_\_\_ (AEB-2), Schedule 5 results in an ROE range of 9.26 percent to 10.50  
22 percent. These results are more consistent with my recommendation of 9.80 percent  
23 than with Mr. Rothschild's recommendation of 8.09 percent. Thus, I recommend

1 that the Commission place greater weight on this revised CAPM analysis because  
2 it is internally consistent and more appropriately reflects investor-expected return  
3 requirements than the CAPM estimate developed by Mr. Rothschild.

4 **E. Adjustments to Mr. Rothschild's ROE Analyses**

5 **Q86. Have you updated Mr. Rothschild's range of ROE results to reflect your**  
6 **suggested adjustments to his ROE estimation models?**

7 A86. Yes, I recalculated the range of ROE results produced by my adjustments to Mr.  
8 Rothschild's Constant Growth DCF and CAPM analyses. As shown in Figure 10,  
9 this results in an ROE range of 9.93 percent to 10.64 percent, which is much higher  
10 than the range of results reported by Mr. Rothschild of 8.10 percent to 8.41 percent.  
11 Furthermore, my recommended ROE of 9.80 percent is only slightly below the

1 range of adjusted results, while Mr. Rothschild recommended ROE of 8.09 percent  
 2 is significantly below the adjusted range of results.

3 **Figure 10: Adjusted Cost of Equity Model Results for Mr. Rothschild**

<b>DCF Model</b>		
	<b>Low</b>	<b>High</b>
Constant Growth	10.25%	10.46%
Non-Constant Growth	10.71%	11.45%
<b>CAPM</b>		
	<b>Low</b>	<b>High</b>
Forward Beta	9.26%	10.50%
Hybrid Beta	9.51%	10.13%
<b>Range of ROE Results</b>		
	<b>Low</b>	<b>High</b>
Average	9.93%	10.64%

4  
 5 **F. Expected Earnings Analysis**

6 **Q87. Please summarize Mr. Rothschild's criticism of your Expected Earnings**  
 7 **analysis.**

8 A87. Mr. Rothschild states that his biggest concern with my Expected Earnings analysis  
 9 is that the approach is not market based but instead relies on the expected return on  
 10 book equity projected by Value Line for the next 3 to 5 years.<sup>124</sup> According to Mr.  
 11 Rothschild, the cost of equity is a completely different concept from the earned  
 12 return on book equity.<sup>125</sup> As a result, Mr. Rothschild concludes that the Expected

<sup>124</sup> Rothschild Direct, at 85.

<sup>125</sup> *Ibid.*

1 Earnings methodology is not a valid method for estimating the cost of equity for  
2 Montana-Dakota.

3 **Q88. Do you agree with Mr. Rothschild's position on this issue?**

4 A88. No, I do not. The *Hope* and *Bluefield* standards establish that a utility should be  
5 granted the opportunity to earn a return that is commensurate with the return on  
6 other investments of similar risk. Therefore, it is reasonable to consider the returns  
7 that investors expect to earn on the common equity of the natural gas utility  
8 companies in the proxy group as a benchmark for a just and reasonable return  
9 because that is the expected earned return on equity that an investor will consider  
10 in determining whether to purchase shares in the company or to seek alternative  
11 investments with a better risk/reward profile. As Dr. Morin notes:

12 The Comparable Earnings standard has a long and rich history in  
13 regulatory proceedings, and finds its origins in the fair return  
14 doctrine enunciated by the U.S. Supreme Court in the landmark  
15 Hope case. The governing principle for setting a fair return decreed  
16 in Hope is that the allowable return on equity should be  
17 commensurate with returns on investments in other firms having  
18 comparable risks, and that the allowed return should be sufficient to  
19 assure confidence in the financial integrity of the firm, in order to  
20 maintain creditworthiness and ability to attract capital on reasonable  
21 terms. Two distinct standards emerge from this basic premise: a  
22 standard of Capital Attraction and a standard of Comparable  
23 Earnings. The Capital Attraction standard focuses on investors'  
24 return requirements, and is applied through market value methods  
25 described in prior chapters, such as DCF, CAPM, or Risk Premium.  
26 The Comparable Earnings standard uses the return earned on book  
27 equity investment by enterprises of comparable risks as the measure  
28 of fair return.<sup>126</sup>

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<sup>126</sup> New Regulatory Finance, Roger A. Morin Ph.D., Public Utility Reports, 2006, at 381.

1           What Mr. Rothschild fails to note in his critique of the Expected Earnings analysis  
2           is that the ROE that is established in this case will be applied to the net book value  
3           of the Company's rate base (subject to certain regulatory adjustments). In this  
4           regard, the Expected Earnings approach provides valuable insight into the  
5           opportunity cost of investing in the Company. If investors devote capital to the  
6           Company (which would offer a return of only 8.09 percent on book value if Mr.  
7           Rothschild's recommendation were adopted), they forgo the opportunity for that  
8           same capital to earn a potentially greater return on book value through investment  
9           in the proxy companies. As a result, the Expected Earnings approach is informative  
10          because it provides a measure of the return on book value that is available to  
11          investors through other investments with comparable risk to Montana-Dakota.

12   **Q89. Does Mr. Rothschild rely on the projected ROEs for 2023 through 2025 from**  
13   **Value Line to calculate his Constant Growth DCF analysis?**

14   A89. Yes, he did. Mr. Rothschild considers the return projections from Value Line for  
15   the period of 2023-2025 to develop the sustainable retention growth rate that he  
16   relies on in his Constant Growth DCF model. Therefore, Mr. Rothschild relies on  
17   the projected ROEs over the same time period to conduct his Constant Growth DCF  
18   analysis as I relied on to develop my Expected Earnings analysis.

19   **G. Capital Structure**

20   **Q90. Please summarize Mr. Rothchild's capital structure recommendation.**

21   A90. Mr. Rothschild supports the Company's proposed capital structure, which includes  
22   50.306 percent common equity, 42.37 percent long-term debt and 7.324 percent

1 short-term debt.<sup>127</sup> While Mr. Rothschild does not propose any adjustments to the  
2 Company's capital structure, he does propose a downward adjustment of 16 basis  
3 points to his recommended ROE to account for the decreased financial risk  
4 associated with the Company's proposed equity ratio since it is approximately 4  
5 percentage points higher than the average of his gas proxy group.<sup>128</sup>

6 **Q91. Do you have any concerns with the analysis of proxy company capital**  
7 **structures on which Mr. Rothschild relies?**

8 A91. Yes. First, Mr. Rothschild's capital structure analysis was based on his natural gas  
9 proxy group which includes Chesapeake, Northwest Natural, NJR and UGI. As I  
10 discussed above, these four companies did not meet the screening criteria that I  
11 used to develop my proxy group. Therefore, as shown in Figure 11, I adjusted Mr.  
12 Rothschild's capital structure analysis to exclude Chesapeake, Northwest Natural,  
13 NJR and UGI. This results in an average equity ratio of 50.2 percent and a median  
14 equity ratio of 51.1 percent for Mr. Rothschild's adjusted proxy group which is  
15 consistent with the Company's proposed equity ratio of 50.306 percent.

16 Furthermore, as shown on page 4 of Schedule ALR-5, the data relied upon by Mr.  
17 Rothschild for his analysis of the proxy company capital structures is reported at  
18 the holding company level. As such, Mr. Rothschild's analysis includes corporate-  
19 level debt that is not part of the regulated or financial capital structure of the  
20 operating utilities. The relevant capital structure for comparison purposes is at the  
21 operating company level, not the holding company. The Commission in this case

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<sup>127</sup> Rothschild Direct, at 16.

<sup>128</sup> *Ibid.*

1 will be setting the capital structure for Montana-Dakota, the operating company,  
2 which will be used to finance investments in rate base that provides natural gas  
3 service to customers.

4 Exhibit No. \_\_\_\_ (AEB-2), Schedule 11 provides the actual capital structures for the  
5 natural gas companies included in my proxy group at the operating level. As  
6 shown, the average equity ratio for the natural gas proxy group companies is 55.73  
7 percent, which is greater than the equity ratio proposed by the Company. Therefore,  
8 counter to Mr. Rothchild's conclusion, the Company has greater financial risk than  
9 the proxy group. Applying Mr. Rothschild's proposed 0.04 percent change in the  
10 ROE for every 1 percent change in common equity ratio<sup>129</sup> would result in an  
11 upward adjustment to ROE of approximately 20 basis points ((55.73 percent –  
12 50.306 percent) x 0.04) to account for the increased financial risk associated with  
13 the Company's proposed equity ratio relative to the proxy group. The Commission

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<sup>129</sup> Rothschild Direct, at 16.

1 should consider this increased financial risk in determining the authorized ROE for  
 2 Montana-Dakota's natural gas operations in North Dakota.

3 **Figure 11: Adjusted Capital Structure Analysis for Mr. Rothschild<sup>130</sup>**

<b>Company</b>	<b>Equity Ratio</b>
Atmos Energy Corporation	62.0%
Northwest Natural Gas Company	44.0%
ONE Gas Inc.	58.0%
South Jersey Industries, Inc.	34.8%
Southwest Gas Corporation	51.2%
Spire, Inc.	50.9%
<b>Average</b>	<b>50.2%</b>
<b>Median</b>	<b>51.1%</b>

4  
 5 **Q92. What effect does the TCJA have on the appropriate capital structure for**  
 6 **Montana-Dakota?**

7 A92. As discussed in my Prepared Direct Testimony, the TCJA places additional  
 8 pressure on utility operating company cash flows and has been viewed negatively  
 9 by credit rating agencies.<sup>131</sup> All three rating agencies have commented on the  
 10 potential negative implications for utilities from the loss of bonus depreciation and  
 11 the reduction in income taxes collected, both of which affect utility cash flows. As  
 12 also discussed in my Prepared Direct Testimony, in the first quarter of 2018, the  
 13 credit rating agencies issued reports identifying this risk factor and suggesting  
 14 mitigation approaches that included increasing the authorized ROE or the equity

<sup>130</sup> Source: Schedule ALR-5, page 4.

<sup>131</sup> Bulkley Prepared Direct, at 27-28.

1 ratio of utility operating subsidiaries.<sup>132</sup> Moody's has since downgraded the credit  
2 rating of several utilities due to concerns about cash flow metrics. The heightened  
3 concern from rating agencies highlights the importance of considering the equity  
4 ratios of the utility operating subsidiaries as the appropriate benchmark to be used  
5 in determining the equity ratio for Montana-Dakota in this proceeding.

6 **Q93. What are your conclusions with respect to the Company's proposed capital**  
7 **structure?**

8 A93. While Mr. Rothschild and I both support the Company's proposed capital structure,  
9 we disagree on how the Company's proposed capital structure affects Montana-  
10 Dakota's risk relative to the proxy group. Mr. Rothschild's comparison of the  
11 Company's proposed capital structure to the capital structures of the holding  
12 companies in his proxy group is inappropriate because the data for the holding  
13 companies reflects the financing of both the regulated and unregulated businesses.  
14 It is more appropriate to rely on my analysis which reviews the capital structures of  
15 the operating subsidiaries of the proxy group companies. Given that the Company's  
16 proposed equity ratio is lower than my proxy group average and considering the  
17 credit rating agencies' guidance for addressing the risks related to the TCJA, it is  
18 reasonable to conclude that Montana-Dakota has greater financial risk relative to

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<sup>132</sup> *Ibid.*

1 the proxy group. As a result, the Commission should consider this additional risk  
2 when determining the authorize ROE for Montana-Dakota.

3 **V. CONCLUSIONS AND RECOMMENDATIONS**

4 **Q94. Please summarize your conclusions and recommendations.**

5 A94. I continue to support the analyses and recommendation contained in my Prepared  
6 Direct Testimony. Specifically, the range of reasonable ROE results for the proxy  
7 group companies is between 9.75 percent and 10.25 percent, and a reasonable cost  
8 of equity for Montana-Dakota is 10.20 percent. The Company, however, has  
9 reduced its requested ROE to 9.80 percent, which is within the range established  
10 by the results of my ROE estimation models and the recently authorized returns in  
11 other jurisdictions, in an effort to mitigate the rate impact on customers in these  
12 difficult economic conditions. An authorized ROE at this level balances the  
13 interests of Montana-Dakota's customers and shareholders, is comparable to the  
14 authorized returns for similarly-situated natural gas utilities, maintains the  
15 Company's financial integrity, and enables Montana-Dakota to attract capital on  
16 reasonable terms and conditions.

17 **Q95. What factors support Montana-Dakota's requested ROE in this case?**

18 A95. Based on my updated analyses, I conclude that my recommended ROE of 9.80  
19 percent remains reasonable for Montana-Dakota's natural gas operations in  
20 Montana. A return at this level is:

- 21 1. Supported by the analyses contained in my Prepared Direct Testimony and  
22 updated in my Prepared Rebuttal Testimony;

- 1           2. Consistent with current and prospective financial market conditions;
- 2           3. Supported by the methodologies considered by the Commission and other
- 3           regulatory jurisdictions;
- 4           4. Consistent with the range of ROEs awards for natural gas distribution
- 5           companies in other state jurisdictions;
- 6           5. Considers the unique business and operating risks of Montana-Dakota's
- 7           natural gas operations in North Dakota; and
- 8           6. Will support Montana-Dakota's ability to attract capital to finance
- 9           investments at reasonable rates, which will provide long-term benefits to
- 10          ratepayers by limiting the long-term cost of capital.

11   **Q96. What is your recommendation with respect to the capital structure?**

12   A96. Montana-Dakota's proposed capital structure of 50.306 percent common equity,  
13       42.37 percent long-term debt and 7.324 percent short-term is reasonable relative to  
14       the operating utilities held by the proxy group companies and takes into  
15       consideration the effect of the TCJA on the cash flows of utilities. Therefore, I  
16       recommend the Commission adopt Montana-Dakota's proposed capital structure.

17   **Q97. Does this conclude your Prepared Rebuttal Testimony?**

18   A97. Yes, it does.

SUMMARY OF ROE ANALYSES RESULTS<sup>1,2</sup>

<b>Constant Growth DCF</b>			
	Median Low	Median	Median High
<b>Excluding NJR</b>			
30-Day Average	8.67%	9.72%	11.40%
90-Day Average	8.84%	9.69%	11.41%
180-Day Average	9.59%	9.57%	11.11%
<b>Including NJR</b>			
30-Day Average	8.67%	9.68%	10.07%
90-Day Average	8.84%	9.62%	10.37%
180-Day Average	9.59%	9.45%	10.28%
<b>CAPM</b>			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
<b>Excluding NJR</b>			
Value Line Beta	12.48%	12.52%	12.62%
Bloomberg Beta	11.60%	11.66%	11.82%
<b>Including NJR</b>			
Value Line Beta	12.61%	12.65%	12.74%
Bloomberg Beta	11.64%	11.70%	11.86%
<b>CAPM - Long-term Average Beta</b>			
Long-term Avg. Beta	10.55%	10.64%	10.87%
<b>ECAPM</b>			
<b>Excluding NJR</b>			
Value Line Beta	12.86%	12.89%	12.97%
Bloomberg Beta	12.20%	12.25%	12.37%
<b>Including NJR</b>			
Value Line Beta	12.96%	12.99%	13.06%
Bloomberg Beta	12.23%	12.28%	12.40%
<b>ECAPM - Long-term Average Beta</b>			
Long-term Avg. Beta	11.42%	11.49%	11.66%
<b>Treasury Yield Plus Risk Premium</b>			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium Analysis	9.22%	9.36%	9.70%
Risk Premium Mean Result	9.42%		
<b>Expected Earnings</b>			
	Mean		Median
Excluding NJR	9.53%		9.12%
Including NJR	9.59%		9.46%

**Notes:**

[1] The analytical results included in the table reflect the results of the Constant Growth DCF analysis excluding the results for individual companies that did not meet the minimum threshold of 7 percent.

[2] Based on the low-end outlier test, scenarios with lower growth rates can result in a higher ROE than scenarios that rely on higher growth rates.

30-DAY CONSTANT GROWTH DCF -- MDU NORTH DAKOTA PROXY GROUP

Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	All Proxy Group			With Exclusions			
										[2]	[3]	[4]	[5]	[6]	[7]	[8]
Almos Energy Corporation	ATO	\$2.50	\$96.40	2.59%	2.68%	7.00%	7.10%	7.10%	7.07%	9.68%	9.68%	9.75%	9.68%	9.75%	9.79%	9.79%
New Jersey Resources Corporation	NJR	\$1.33	\$34.77	3.83%	3.91%	2.00%	6.00%	6.00%	4.67%	5.86%	5.86%	8.58%	8.58%	8.58%	8.58%	9.94%
Northwest Natural Gas Company	NWN	\$1.92	\$48.14	3.99%	4.07%	5.97%	3.10%	3.10%	4.06%	7.15%	7.15%	8.12%	8.12%	8.12%	10.07%	10.07%
ONE Gas Inc.	OGS	\$2.16	\$78.48	2.75%	2.83%	6.50%	5.00%	5.50%	5.67%	7.82%	7.82%	8.50%	8.50%	8.50%	9.34%	9.34%
South Jersey Industries, Inc.	SJI	\$1.21	\$22.68	5.34%	5.86%	12.50%	24.50%	24.50%	20.50%	18.17%	18.17%	26.38%	26.38%	26.38%	30.49%	30.49%
Southwest Gas Corporation	SWX	\$2.28	\$63.83	3.57%	3.68%	9.00%	4.00%	5.00%	6.00%	7.64%	7.64%	9.68%	9.68%	9.68%	12.73%	12.73%
Splite, Inc.	SR	\$2.60	\$64.47	4.03%	4.22%	5.50%	5.37%	16.50%	9.12%	9.51%	9.51%	13.34%	13.34%	13.34%	20.87%	20.87%
Median Excluding NJR				3.78%	3.87%	6.75%	5.19%	6.30%	6.53%	8.67%	8.67%	9.72%	9.72%	9.72%	11.40%	11.40%
Median Including NJR				3.83%	3.91%	6.50%	5.37%	6.00%	6.00%	7.82%	7.82%	9.68%	9.68%	9.68%	10.07%	10.07%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals 30-day average as of December 31, 2020
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [8])
- [5] Source: Value Line
- [6] Source: Yahoo! Finance
- [7] Source: Zacks
- [8] Equals Average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Maximum ([5], [6], [7]))
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Minimum ([5], [6], [7]))
- [12] Equals [9] if greater than 7.00%
- [13] Equals [10] if greater than 7.00%
- [14] Equals [11] if greater than 7.00%
- [15] The Value Line Growth Rate for NWN was adjusted to exclude the negative EPS data for 2017 which resulted in an adjusted projected EPS growth rate of 5.97% (Source: Schedule-2, page 4).

90-DAY CONSTANT GROWTH DCF -- MDU NORTH DAKOTA PROXY GROUP

Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	All Proxy Group			With Exclusions		
										[2]	[3]	[4]	[5]	[6]	[7]
Almos Energy Corporation	ATO	\$2.50	\$96.22	2.60%	2.69%	7.00%	7.10%	7.10%	7.07%	9.69%	9.76%	9.79%	9.69%	9.76%	9.79%
New Jersey Resources Corporation	NJR	\$1.33	\$31.37	4.24%	4.34%	2.00%	6.00%	6.00%	4.67%	6.28%	9.01%	10.37%	6.28%	9.01%	10.37%
Northwest Natural Gas Company	NWN	\$1.92	\$47.35	4.05%	4.14%	5.97%	3.10%	3.10%	4.06%	7.22%	8.19%	10.14%	7.22%	8.19%	10.14%
ONE Gas Inc.	OGS	\$2.16	\$74.13	2.91%	3.00%	6.50%	5.00%	5.50%	5.67%	7.99%	8.66%	9.51%	7.99%	8.66%	9.51%
South Jersey Industries, Inc.	SJI	\$1.21	\$21.29	5.68%	6.27%	12.50%	24.50%	24.50%	20.50%	18.54%	26.77%	30.88%	18.54%	26.77%	30.88%
Southwest Gas Corporation	SWX	\$2.28	\$64.91	3.51%	3.62%	9.00%	4.00%	5.00%	6.00%	7.58%	9.62%	12.67%	7.58%	9.62%	12.67%
Splite, Inc.	SR	\$2.60	\$59.16	4.39%	4.60%	5.50%	5.37%	16.50%	9.12%	9.88%	13.72%	21.26%	9.88%	13.72%	21.26%
Median Excluding NJR				3.78%	3.88%	6.75%	5.19%	6.30%	6.53%	8.84%	9.69%	11.41%	8.84%	9.69%	11.41%
Median Including NJR				4.05%	4.14%	6.50%	5.37%	6.00%	6.00%	7.99%	9.62%	10.37%	7.99%	9.62%	10.37%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals 90-day average as of December 31, 2020
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [8])
- [5] Source: Value Line
- [6] Source: Yahoo! Finance
- [7] Source: Zacks
- [8] Equals Average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7]))
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7]))
- [12] Equals [9] if greater than 7.00%
- [13] Equals [10] if greater than 7.00%
- [14] Equals [11] if greater than 7.00%
- [15] The Value Line Growth Rate for NWN was adjusted to exclude the negative EPS data for 2017 which resulted in an adjusted projected EPS growth rate of 5.97% (Source: Schedule-2, page 4).

180-DAY CONSTANT GROWTH DCF – MDU NORTH DAKOTA PROXY GROUP

Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	All Proxy Group			With Exclusions		
										[2]	[3]	[4]	[5]	[6]	[7]
Almos Energy Corporation	ATO	\$2.50	\$98.86	2.53%	2.62%	7.00%	7.10%	7.10%	7.07%	9.62%	9.68%	9.72%	9.62%	9.68%	9.72%
New Jersey Resources Corporation	NJR	\$1.33	\$31.98	4.16%	4.26%	2.00%	6.00%	6.00%	4.67%	6.20%	8.92%	10.28%	6.20%	8.92%	10.28%
Northwest Natural Gas Company	NWN	\$1.92	\$52.66	3.65%	3.72%	5.97%	3.10%	3.10%	4.06%	6.80%	7.78%	9.72%	6.80%	7.78%	9.72%
ONE Gas Inc.	OGS	\$2.16	\$76.19	2.84%	2.92%	6.50%	5.00%	5.50%	5.67%	7.91%	8.58%	9.43%	7.91%	8.58%	9.43%
South Jersey Industries, Inc.	SJI	\$1.21	\$23.36	5.18%	5.71%	12.50%	24.50%	24.50%	20.50%	18.00%	26.21%	30.31%	18.00%	26.21%	30.31%
Southwest Gas Corporation	SWX	\$2.28	\$68.16	3.35%	3.45%	9.00%	4.00%	5.00%	6.00%	7.41%	9.45%	12.50%	7.41%	9.45%	12.50%
Splite, Inc.	SR	\$2.60	\$63.27	4.11%	4.30%	5.50%	16.50%	16.50%	9.12%	9.59%	13.42%	20.95%	9.59%	13.42%	20.95%
Median Excluding NJR				3.50%	3.58%	6.75%	5.19%	6.30%	6.53%	8.75%	9.57%	11.11%	9.59%	9.57%	11.11%
Median Including NJR				3.65%	3.72%	6.50%	5.37%	6.00%	6.00%	7.91%	9.45%	10.28%	9.59%	9.45%	10.28%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals 180-day average as of December 31, 2020
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [8])
- [5] Source: Value Line
- [6] Source: Yahoo! Finance
- [7] Source: Zacks
- [8] Equals Average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
- [12] Equals [9] if greater than 7.00%
- [13] Equals [10] if greater than 7.00%
- [14] Equals [11] if greater than 7.00%
- [15] The Value Line Growth Rate for NWN was adjusted to exclude the negative EPS data for 2017 which resulted in an adjusted projected EPS growth rate of 5.97% (Source: Schedule-2, page 4).

**Actual and Adjusted Calculation of Northwest Natural's  
 Projected Earnings Growth Rate from Value Line**

	[1]	[2]	[3]
	Actual Earnings Per Share	Projected Earnings Per Share (2023-2025)	Projected Earnings Growth Rate
2017	-1.94		
2018	2.33		
2019	2.19		
Mean (2017-2019)	0.86	3.2	24.48%
Mean (2018-2019)	2.26	3.2	5.97%

**Notes:**

[1] Source: Value Line, dated November 27, 2020.

[2] Source: Value Line, dated November 27, 2020.

[3] Equals  $([2] / [1])^{(1/6)} - 1$

CAPITAL ASSET PRICING MODEL – CURRENT RISK-FREE RATE & VL BETA

$$K = R_f + \beta (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE
Atmos Energy Corporation	ATO	1.65%	0.80	14.02%	12.38%	11.55%	12.17%
New Jersey Resources Corporation	NJR	1.65%	0.95	14.02%	12.38%	13.40%	13.56%
Northwest Natural Gas Company	NWN	1.65%	0.80	14.02%	12.38%	11.55%	12.17%
ONE Gas Inc.	OGS	1.65%	0.80	14.02%	12.38%	11.55%	12.17%
South Jersey Industries, Inc.	SJI	1.65%	1.05	14.02%	12.38%	14.64%	14.49%
Southwest Gas Corporation	SWX	1.65%	0.95	14.02%	12.38%	13.40%	13.56%
Spire, Inc.	SR	1.65%	0.85	14.02%	12.38%	12.17%	12.63%
Mean Excluding NJR						12.48%	12.86%
Mean Including NJR						12.61%	12.96%

Notes:

- [1] Source: Bloomberg Professional  
 [2] Source: Value Line Reports, November 27, 2020  
 [3] Source: Schedule-6  
 [4] Equals [3] - [1]  
 [5] Equals [1] + [2] x [4]  
 [6] Equals [1] + 0.25 x (4) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL – NEAR-TERM PROJECTED RISK-FREE RATE & VL BETA

$$K = R_f + \beta (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q2 2021 - Q2 2022)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE
Atmos Energy Corporation	ATO	1.98%	0.80	14.02%	12.04%	11.61%	12.22%
New Jersey Resources Corporation	NJR	1.98%	0.95	14.02%	12.04%	13.42%	13.57%
Northwest Natural Gas Company	NWN	1.98%	0.80	14.02%	12.04%	11.61%	12.22%
ONE Gas Inc.	OGS	1.98%	0.80	14.02%	12.04%	11.61%	12.22%
South Jersey Industries, Inc.	SJI	1.98%	1.05	14.02%	12.04%	14.62%	14.47%
Southwest Gas Corporation	SWX	1.98%	0.95	14.02%	12.04%	13.42%	13.57%
Spire, Inc.	SR	1.98%	0.85	14.02%	12.04%	12.22%	12.67%
Mean Excluding NJR						12.52%	12.89%
Mean Including NJR						12.65%	12.99%

Notes:

- [1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 1, January 1, 2021, at 2  
 [2] Source: Value Line Reports, November 27, 2020  
 [3] Source: Schedule-6  
 [4] Equals [3] - [1]  
 [5] Equals [1] + [2] x [4]  
 [6] Equals [1] + 0.25 x (4) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL – LONG-TERM PROJECTED RISK-FREE RATE & VL BETA

$$K = R_f + \beta (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2022 - 2026)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE
Atmos Energy Corporation	ATO	2.80%	0.80	14.02%	11.22%	11.78%	12.34%
New Jersey Resources Corporation	NJR	2.80%	0.95	14.02%	11.22%	13.46%	13.60%
Northwest Natural Gas Company	NWN	2.80%	0.80	14.02%	11.22%	11.78%	12.34%
ONE Gas Inc.	OGS	2.80%	0.80	14.02%	11.22%	11.78%	12.34%
South Jersey Industries, Inc.	SJI	2.80%	1.05	14.02%	11.22%	14.58%	14.44%
Southwest Gas Corporation	SWX	2.80%	0.95	14.02%	11.22%	13.46%	13.60%
Spire, Inc.	SR	2.80%	0.85	14.02%	11.22%	12.34%	12.76%
Mean Excluding NJR						12.62%	12.97%
Mean Including NJR						12.74%	13.06%

Notes:

- [1] [1] Source: Blue Chip Financial Forecasts, Vol. 39, No. 12, December 1, 2020, at 14  
 [2] Source: Value Line Reports, November 27, 2020  
 [3] Source: Schedule-6  
 [4] Equals [3] - [1]  
 [5] Equals [1] + [2] x [4]  
 [6] Equals [1] + 0.25 x (4) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL – CURRENT RISK-FREE RATE & BLOOMBERG BETA

$$K = R_f + \beta (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE
Atmos Energy Corporation	ATO	1.65%	0.75	14.02%	12.38%	10.99%	11.75%
New Jersey Resources Corporation	NJR	1.65%	0.83	14.02%	12.38%	11.90%	12.43%
Northwest Natural Gas Company	NWN	1.65%	0.74	14.02%	12.38%	10.82%	11.62%
ONE Gas Inc.	OGS	1.65%	0.85	14.02%	12.38%	12.12%	12.60%
South Jersey Industries, Inc.	SJI	1.65%	0.85	14.02%	12.38%	12.20%	12.65%
Southwest Gas Corporation	SWX	1.65%	0.87	14.02%	12.38%	12.37%	12.78%
Spire, Inc.	SR	1.65%	0.76	14.02%	12.38%	11.07%	11.81%
Mean Excluding NJR						11.60%	12.20%
Mean Including NJR						11.64%	12.23%

Notes:

- [1] Source: Bloomberg Professional  
 [2] Source: Bloomberg Professional  
 [3] Source: Schedule-6  
 [4] Equals [3] - [1]  
 [5] Equals [1] + [2] x [4]  
 [6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL – NEAR-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$$K = R_f + \beta (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q2 2021 - Q2 2022)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE
Atmos Energy Corporation	ATO	1.98%	0.75	14.02%	12.04%	11.07%	11.81%
New Jersey Resources Corporation	NJR	1.98%	0.83	14.02%	12.04%	11.96%	12.48%
Northwest Natural Gas Company	NWN	1.98%	0.74	14.02%	12.04%	10.91%	11.69%
ONE Gas Inc.	OGS	1.98%	0.85	14.02%	12.04%	12.17%	12.64%
South Jersey Industries, Inc.	SJI	1.98%	0.85	14.02%	12.04%	12.25%	12.69%
Southwest Gas Corporation	SWX	1.98%	0.87	14.02%	12.04%	12.42%	12.82%
Spire, Inc.	SR	1.98%	0.76	14.02%	12.04%	11.15%	11.87%
Mean Excluding NJR						11.66%	12.25%
Mean Including NJR						11.70%	12.28%

Notes:

- [1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 1, January 1, 2021, at 2  
 [2] Source: Bloomberg Professional  
 [3] Source: Schedule-6  
 [4] Equals [3] - [1]  
 [5] Equals [1] + [2] x [4]  
 [6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL – LONG-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$$K = R_f + \beta (R_m - R_f)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2022 - 2026)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm - Rf)	ROE (K)	ECAPM ROE
Atmos Energy Corporation	ATO	2.80%	0.75	14.02%	11.22%	11.27%	11.96%
New Jersey Resources Corporation	NJR	2.80%	0.83	14.02%	11.22%	12.10%	12.58%
Northwest Natural Gas Company	NWN	2.80%	0.74	14.02%	11.22%	11.12%	11.85%
ONE Gas Inc.	OGS	2.80%	0.85	14.02%	11.22%	12.30%	12.73%
South Jersey Industries, Inc.	SJI	2.80%	0.85	14.02%	11.22%	12.37%	12.78%
Southwest Gas Corporation	SWX	2.80%	0.87	14.02%	11.22%	12.53%	12.90%
Spire, Inc.	SR	2.80%	0.76	14.02%	11.22%	11.35%	12.02%
Mean Excluding NJR						11.82%	12.37%
Mean Including NJR						11.86%	12.40%

Notes:

- [1] [1] Source: Blue Chip Financial Forecasts, Vol. 39, No. 12, December 1, 2020, at 14  
 [2] Source: Bloomberg Professional  
 [3] Source: Schedule-6  
 [4] Equals [3] - [1]  
 [5] Equals [1] + [2] x [4]  
 [6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL – LONG-TERM AVERAGE BETA

$CAPM: K = R_f + \beta (R_m - R_f) / ECAPM: K = R_f + 0.25(R_m - R_f) + 0.75\beta (R_m - R_f)$

	[4]	[5]	[6]	[7]	[8]	[9]
	Risk-Free Rate ( $R_f$ )	Beta ( $\beta$ )	Market Return ( $R_m$ )	Market Risk Premium ( $R_m - R_f$ )	CAPM ( $K$ )	ECAPM ( $K$ )
Current 30-day average of 30-year U.S. Treasury bond yield [1]	1.65%	0.719	14.02%	12.38%	10.55%	11.42%
Near-term projected 30-year U.S. Treasury bond yield (Q2 2021 - Q2 2022) [2]	1.98%	0.719	14.02%	12.04%	10.64%	11.49%
Projected 30-year U.S. Treasury bond yield (2022 - 2026) [3]	2.80%	0.719	14.02%	11.22%	10.87%	11.66%
				<b>Average:</b>	<b>10.69%</b>	<b>11.52%</b>

Notes:

- [1] Source: Bloomberg Professional  
 [2] Source: Blue Chip Financial Forecasts, Vol. 40, No. 1, January 1, 2021, at 2  
 [3] Source: Blue Chip Financial Forecasts, Vol. 39, No. 12, December 1, 2020, at 14  
 [4] See Notes [1], [2], and [3]  
 [5] Source: Schedule-5  
 [6] Source: Schedule-6  
 [7] Equals [6] - [4]  
 [8] Equals [4] + [5] x [7]  
 [9] Equals [4] + 0.25 x ([7]) + 0.75 x ([5] x [7])

HISTORICAL BETA - 2011 - 2020

Company	Ticker	[1] 12/31/2011	[2] 12/31/2012	[3] 12/31/2013	[4] 12/31/2014	[5] 12/31/2015	[6] 12/31/2016	[7] 12/31/2017	[8] 12/31/2018	[9] 12/31/2019	[10] 12/31/2020	[11] Average
Atmos Energy Corporation	ATO	0.70	0.70	0.80	0.80	0.80	0.70	0.70	0.60	0.60	0.80	0.72
New Jersey Resources Corporation	NJR	0.65	0.65	0.70	0.80	0.80	0.80	0.80	0.70	0.70	0.80	0.76
Northwest Natural Gas Company	NWN	0.60	0.55	0.65	0.70	0.65	0.60	0.70	0.60	0.60	0.80	0.65
ONE Gas Inc.	OGS	N/A	N/A	N/A	N/A	N/A	N/A	0.70	0.65	0.65	0.80	0.70
South Jersey Industries, Inc.	SJI	0.65	0.65	0.70	0.80	0.80	0.80	0.85	0.80	0.80	1.05	0.79
Southwest Gas Corporation	SWX	0.75	0.75	0.80	0.85	0.80	0.75	0.80	0.70	0.70	0.95	0.79
Spire, Inc.	SR	0.60	0.55	0.65	0.70	0.70	0.70	0.70	0.65	0.65	0.85	0.68
Mean Excluding NJR		0.66	0.64	0.72	0.77	0.75	0.71	0.74	0.67	0.67	0.88	0.72
Mean Including NJR		0.66	0.64	0.72	0.78	0.76	0.73	0.75	0.67	0.67	0.89	0.72

Notes:

- [1] Value Line, dated December 9, 2011.
- [2] Value Line, dated December 7, 2012.
- [3] Value Line, dated December 6, 2013.
- [4] Value Line, dated December 5, 2014.
- [5] Value Line, dated December 4, 2015.
- [6] Value Line, dated December 2, 2016.
- [7] Value Line, dated December 1, 2017.
- [8] Value Line, dated November 30, 2018.
- [9] Value Line, dated November 29, 2019.
- [10] Value Line, dated November 27, 2020.
- [11] Average ([1] - [10])

MARKET RISK PREMIUM DERIVED FROM S&P EARNINGS AND ESTIMATE REPORT

[7] S&P's estimate of the S&P 500 Dividend Yield	1.51%
[8] S&P's estimate of the S&P 500 Growth Rate	12.42%
[9] S&P 500 Estimated Required Market Return	14.02%

Notes:

[7] Source: S&P Dow Jones Indices, S&P 500 Earnings and Estimate Report, December 31, 2020

[8] Source: S&P Dow Jones Indices, S&P 500 Earnings and Estimate Report, December 31, 2020

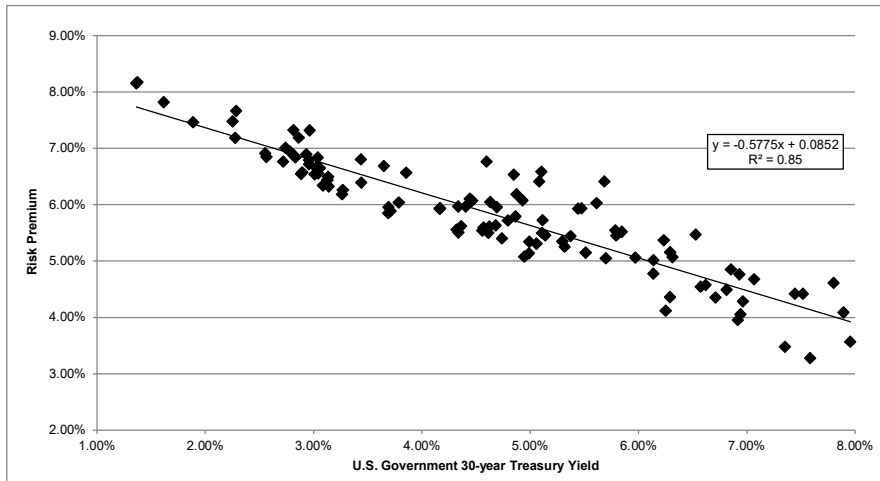
[9] Equals  $([7] \times (1 + (0.5 \times [8]))) + [8]$

BOND YIELD PLUS RISK PREMIUM

	[1] Average Authorized Gas ROE	[2] U.S. Govt. 30-year Treasury	[3] Risk Premium
1992.1	12.42%	7.80%	4.62%
1992.2	11.98%	7.89%	4.09%
1992.3	11.87%	7.45%	4.42%
1992.4	11.94%	7.52%	4.42%
1993.1	11.75%	7.07%	4.68%
1993.2	11.71%	6.86%	4.85%
1993.3	11.39%	6.31%	5.07%
1993.4	11.16%	6.14%	5.02%
1994.1	11.12%	6.57%	4.55%
1994.2	10.84%	7.35%	3.48%
1994.3	10.87%	7.58%	3.28%
1994.4	11.53%	7.96%	3.57%
1995.2	11.00%	6.94%	4.06%
1995.3	11.07%	6.71%	4.35%
1995.4	11.61%	6.23%	5.37%
1996.1	11.45%	6.29%	5.16%
1996.2	10.88%	6.92%	3.96%
1996.3	11.25%	6.96%	4.29%
1996.4	11.19%	6.62%	4.58%
1997.1	11.31%	6.81%	4.49%
1997.2	11.70%	6.93%	4.77%
1997.3	12.00%	6.53%	5.47%
1997.4	10.92%	6.14%	4.78%
1998.2	11.37%	5.85%	5.52%
1998.3	11.41%	5.47%	5.94%
1998.4	11.69%	5.10%	6.59%
1999.1	10.82%	5.37%	5.44%
1999.2	11.25%	5.79%	5.46%
1999.4	10.38%	6.25%	4.12%
2000.1	10.66%	6.29%	4.36%
2000.2	11.03%	5.97%	5.06%
2000.3	11.33%	5.79%	5.55%
2000.4	12.10%	5.69%	6.41%
2001.1	11.38%	5.44%	5.93%
2001.2	10.75%	5.70%	5.05%
2001.4	10.65%	5.30%	5.35%
2002.1	10.67%	5.51%	5.15%
2002.2	11.64%	5.61%	6.03%
2002.3	11.50%	5.08%	6.42%
2002.4	11.01%	4.93%	6.08%
2003.1	11.38%	4.85%	6.53%
2003.2	11.36%	4.60%	6.76%
2003.3	10.61%	5.11%	5.50%
2003.4	10.84%	5.11%	5.73%
2004.1	11.06%	4.88%	6.18%
2004.2	10.57%	5.32%	5.25%
2004.3	10.37%	5.06%	5.31%
2004.4	10.66%	4.86%	5.79%
2005.1	10.65%	4.69%	5.96%
2005.2	10.54%	4.47%	6.07%
2005.3	10.47%	4.44%	6.03%
2005.4	10.32%	4.68%	5.63%
2006.1	10.68%	4.63%	6.05%
2006.2	10.60%	5.14%	5.46%
2006.3	10.34%	4.99%	5.34%
2006.4	10.14%	4.74%	5.40%
2007.1	10.52%	4.80%	5.72%
2007.2	10.13%	4.99%	5.14%
2007.3	10.03%	4.95%	5.08%
2007.4	10.12%	4.61%	5.50%
2008.1	10.38%	4.41%	5.97%
2008.2	10.17%	4.57%	5.60%
2008.3	10.55%	4.44%	6.11%
2008.4	10.34%	3.65%	6.69%
2009.1	10.24%	3.44%	6.81%
2009.2	10.11%	4.17%	5.94%
2009.3	9.88%	4.32%	5.56%
2009.4	10.31%	4.34%	5.97%
2010.1	10.24%	4.62%	5.61%
2010.2	9.99%	4.36%	5.62%
2010.3	10.43%	3.86%	6.57%
2010.4	10.09%	4.17%	5.93%
2011.1	10.10%	4.56%	5.54%
2011.2	9.85%	4.34%	5.51%
2011.3	9.65%	3.69%	5.96%
2011.4	9.88%	3.04%	6.84%
2012.1	9.63%	3.14%	6.50%
2012.2	9.83%	2.93%	6.90%
2012.3	9.75%	2.74%	7.01%
2012.4	10.06%	2.86%	7.19%
2013.1	9.57%	3.13%	6.44%
2013.2	9.47%	3.14%	6.33%
2013.3	9.60%	3.71%	5.89%

BOND YIELD PLUS RISK PREMIUM

	[1]	[2]	[3]
	Average Authorized Gas ROE	U.S. Govt. 30-year Treasury	Risk Premium
2013.4	9.83%	3.79%	6.04%
2014.1	9.54%	3.69%	5.85%
2014.2	9.84%	3.44%	6.39%
2014.3	9.45%	3.26%	6.19%
2014.4	10.28%	2.96%	7.32%
2015.1	9.47%	2.55%	6.91%
2015.2	9.43%	2.88%	6.55%
2015.3	9.75%	2.96%	6.79%
2015.4	9.68%	2.96%	6.72%
2016.1	9.48%	2.72%	6.76%
2016.2	9.42%	2.57%	6.85%
2016.3	9.47%	2.28%	7.19%
2016.4	9.67%	2.83%	6.84%
2017.1	9.60%	3.04%	6.56%
2017.2	9.47%	2.90%	6.58%
2017.3	10.14%	2.82%	7.32%
2017.4	9.70%	2.82%	6.88%
2018.1	9.68%	3.02%	6.66%
2018.2	9.43%	3.09%	6.34%
2018.3	9.71%	3.06%	6.65%
2018.4	9.53%	3.27%	6.26%
2019.1	9.55%	3.01%	6.54%
2019.2	9.73%	2.78%	6.94%
2019.3	9.95%	2.29%	7.66%
2019.4	9.73%	2.25%	7.48%
2020.1	9.35%	1.89%	7.46%
2020.2	9.55%	1.38%	8.17%
2020.3	9.52%	1.37%	8.15%
2020.4	9.44%	1.62%	7.82%
AVERAGE	10.48%	4.63%	5.84%
MEDIAN	10.37%	4.63%	5.93%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.921943
R Square	0.849978
Adjusted R Square	0.848614
Standard Error	0.003925
Observations	112

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.009602	0.009602	623.225685	0.000000
Residual	110	0.001695	0.000015		
Total	111	0.011296			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.0852	0.0011339	75.14	0.000000	0.082949	0.087443	0.082949	0.087443
U.S. Govt. 30-year Treasury	(0.5775)	0.0231321	(24.96)	0.000000	(0.623323)	(0.531638)	(0.623323)	(0.531638)

	[7]	[8]	[9]
	U.S. Govt. 30-year Treasury	Risk Premium	ROE
Current 30-day average of 30-year U.S. Treasury bond yield [4]	1.65%	7.57%	9.22%
Blue Chip Consensus Forecast (Q2 2021 - Q2 2022) [5]	1.98%	7.38%	9.36%
Blue Chip Consensus Forecast (2022-2026) [6]	2.80%	6.90%	9.70%
<b>AVERAGE</b>			<b>9.42%</b>

Notes:

- [1] Source: Regulatory Research Associates, rate cases through December 31, 2020
- [2] Source: Bloomberg Professional, quarterly bond yields are the average of each trading day in the quarter
- [3] Equals Column [1] - Column [2]
- [4] Source: Bloomberg Professional, 30-day average as of December 31, 2020
- [5] Source: Blue Chip Financial Forecasts, Vol. 40, No. 1, January 1, 2021, at 2
- [6] Source: Blue Chip Financial Forecasts, Vol. 39, No. 12, December 1, 2020, at 14
- [7] See notes [4], [5] & [6]
- [8] Equals 0.084369 + (-0.562291 x Column [7])
- [9] Equals Column [7] + Column [8]

EXPECTED EARNINGS ANALYSIS

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
	Value Line ROE 2023-2025	Value Line Total Capital 2019	Value Line Common Equity Ratio 2019	Total Equity 2019	Value Line Total Capital 2023-2025	Value Line Common Equity Ratio 2023-2025	Total Equity 2023-2025	Compound Annual Growth Rate	Adjustment Factor	Adjusted Return on Common Equity
Atmos Energy Corporation	9.00%	9,279.7	62.00%	5,753.41	16,000.0	60.00%	9,600.00	10.78%	1.051	9.46%
New Jersey Resources Corporation	9.50%	3,088.9	50.20%	1,550.63	4,580.0	56.50%	2,587.70	10.79%	1.051	9.99%
Northwest Natural Gas Company	8.50%	1,672.0	51.80%	866.10	1,825.0	52.50%	958.13	2.04%	1.010	8.59%
ONE Gas Inc.	8.50%	3,415.5	62.30%	2,127.86	4,800.0	62.00%	2,976.00	6.94%	1.034	8.79%
South Jersey Industries, Inc.	12.00%	3,493.9	40.80%	1,425.51	5,500.0	41.00%	2,255.00	9.61%	1.046	12.55%
Southwest Gas Corporation	10.00%	4,806.4	52.10%	2,504.13	7,200.0	55.50%	3,996.00	9.80%	1.047	10.47%
Spite, Inc.	7.00%	4,625.6	55.00%	2,544.08	7,200.0	55.00%	3,960.00	9.25%	1.044	7.31%
Mean Excluding NJR										9.53%
Median Including NJR										9.59%
Median Excluding NJR										9.12%
Median Including NJR										9.46%

Notes:

- [1] Source: Value Line Reports, November 27, 2020
- [2] Source: Value Line Reports, November 27, 2020
- [3] Source: Value Line Reports, November 27, 2020
- [4] Equals [2] x [3]
- [5] Source: Value Line Reports, November 27, 2020
- [6] Source: Value Line Reports, November 27, 2020
- [7] Equals [5] x [6]
- [8] Equals  $([7] / [4]) ^ (1/5) - 1$
- [9] Equals  $2 \times (1 + [8]) / (2 + [8])$
- [10] Equals [1] x [9]

MR. ROTHSCHILD'S ADJUSTED CONSTANT GROWTH DCF ANALYSIS

	Line No.	Formula/Note	Based on Average Market Price For Year Ending 12/31/2020	Based on Market Price As Of 12/31/2020
Dividend Yield	[1]	Schedule ALR-3, page 1	3.34%	3.55%
Average Earnings Growth Rate	[2]	Zacks, Yahoo! and Value Line	6.79%	6.79%
Increment to Dividend Yield for Growth to Next Year	[3]	Equals [1] x (0.5 x [2])	0.11%	0.12%
Required Return for Montana-Dakota	[4]	Equals [1] + [2] + [3]	10.25%	10.46%

ZACKS, YAHOO! FINANCE AND VALUE LINE EARNINGS GROWTH RATES AS OF DECEMBER 31, 2020

Company	Ticker	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate
Atmos Energy Corporation	ATO	7.00%	7.10%	7.10%	7.07%
Chesapeake Utilities Corporation	CPK	9.00%	4.74%	NA%	6.87%
New Jersey Resources Corporation	NJR	2.00%	6.00%	6.00%	4.67%
NiSource Inc.	NI	13.00%	1.65%	5.60%	6.75%
Northwest Natural Gas Company	NWN	5.97%	3.10%	3.10%	4.06%
ONE Gas, Inc.	OGS	6.50%	5.00%	5.50%	5.67%
South Jersey Industries, Inc.	SJI	12.50%	24.50%	24.50%	20.50%
Southwest Gas Corporation	SWX	9.00%	4.00%	5.00%	6.00%
Spire, Inc.	SR	5.50%	5.37%	16.50%	9.12%
UGI Corporation	UGI	5.50%	7.00%	8.00%	6.83%
Median		6.75%	5.19%	6.00%	6.79%

Notes:

[1] The Value Line Growth Rate for NWN was adjusted to exclude the negative EPS data for 2017 which resulted in an adjusted projected EPS growth rate of 5.97% (Source: Schedule-2, page 4).

MR. ROTHSCHILD'S ADJUSTED CAPM ANALYSIS

	Line No.	Formula/Note	Weighted Beta & Risk-Free Rate		Spot Beta & Risk-Free Rate	
			Forward Beta	Hybid Beta	Forward Beta	Hybid Beta
Risk Free	[1]	Schedule ALR-4, page 2	1.63%	1.63%	1.65%	1.65%
Beta	[2]	Schedule ALR-4, page 3	0.62	0.64	0.72	0.69
Market Return	[3]	Exhibit No.__(AEB-2), Schedule 5	13.95%	13.95%	13.95%	13.95%
Required Return for Montana-Dakota	[4]	Equals [1] + [2] x ([3] - [1])	9.26%	9.51%	10.50%	10.13%