

BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION OF
MONTANA-DAKOTA UTILITIES CO., A
DIVISION OF MDU RESOURCES GROUP,
INC. FOR AUTHORITY TO ESTABLISH
INCREASED RATES FOR NATURAL GAS
SERVICE

DOCKET NO. PU-17-295

SURREBUTTAL TESTIMONY OF

MARLON F. GRIFFING, PH.D.

ON BEHALF OF

NORTH DAKOTA PUBLIC SERVICE COMMISSION STAFF

May 2, 2018

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EXHIBITS:

- MFG-21 Rate of Return (ROR) Analysis
- MFG-22, pages 1-2 Comparison Group Common Equity Share Prices
- MFG-23 Comparison Group Dividends
- MFG-24, Schedule 1 Constant-Growth Discounted Cash Flow (DCF) Analysis
- MFG-24, Schedule 2 Congressional Budget Office Gross Domestic Product (GDP) Projection
- MFG-24, Schedule 3 U.S. Energy Information Administration Gross Domestic Product (GDP) Projection
- MFG-24, Schedule 4 Multi-Stage DCF Analysis
- MFG-24, Schedule 5 Constant-Growth DCF with Gaske Flotation Cost Adjustment Analysis
- MFG-25, Schedule 1 Daily Treasury Yield Curve
- MFG-25, Schedule 2 Value Line Betas
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- MFG-26 Flotation-cost calculation from *New Regulatory Finance*
- MFG-27 Ben Bernanke statement regarding the Federal Reserve's balance sheet target size, CNBC

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.**

3 A. My name is Dr. Marlon F. Griffing. I am a Senior Consultant with the economic
4 consulting firm of PCMG & Associates Inc. (“PCMG”). My business address is 22
5 Brookes Drive, Gaithersburg, MD 20785.

6 **Q. ARE YOU THE SAME DR. MARLON F. GRIFFING WHO FILED DIRECT**
7 **TESTIMONY ON BEHALF OF THE NORTH DAKOTA PUBLIC SERVICE**
8 **COMMISSION ADVOCACY STAFF IN THIS DOCKET?**

9 A. Yes. I am filing Surrebuttal Testimony regarding the cost of capital for the natural-gas
10 distribution company Montana-Dakota Utilities (“Montana-Dakota” or the “Company”) in
11 this docket before the North Dakota Public Service Commission (“Commission”).

12 **Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

13 A. My testimony has two purposes. I update my recommended return on equity (“ROE”) and
14 overall rate of return (“ROR”) for Montana-Dakota, a wholly-owned division of MDU
15 Resources, Inc. (MDU Resources), using the same methods I used to develop an ROE and
16 ROR in my Direct Testimony. I also respond to the Rebuttal Testimony of Company
17 witness Dr. J. Stephen Gaske.

18 **Q. HOW IS YOUR TESTIMONY ORGANIZED?**

19 A. My testimony has six sections.
20 ■ First, I update my Discounted Cash Flow (“DCF”) model ROE analysis for Montana-
21 Dakota from the values I presented in my Direct Testimony. I apply the same methods,
22 but I include more recent values for common-equity share prices, dividends paid, and
23 forecasted earnings per share (EPS) growth rates for the natural-gas distribution

1 companies in my Comparison Group. I made a change in the membership of the
2 Comparison Group, dropping one company in recognition of its ongoing acquisition of
3 another natural-gas distribution company. I also modified my multistage DCF analysis,
4 adding a second source for a long-term gross domestic product (GDP) growth rate.

- 5 ■ Second, I update my capital asset pricing model (CAPM) analysis. Again, I use the
6 same methods employed in my Direct Testimony, but the inputs are the most recent
7 values for Comparison Group companies' betas, Value Line's projected dividend
8 earnings and growth rates for the universe of 1,700 stocks that it follows, and the risk-
9 free rate of return. I also perform CAPM analyses using methods adopted by Dr. Gaske
10 and by Federal Executive Agencies' (FEA) cost of capital witness Michael P. Gorman.
- 11 ■ Third, I respond to criticisms of my DCF ROE analysis by Dr. Gaske.
- 12 ■ Fourth, I respond to criticisms of my CAPM ROE analysis made by Dr. Gaske.
- 13 ■ Fifth, I recommend a capital structure and overall rate of return for the Company.
- 14 ■ Sixth, I summarize my testimony and recommendations.

15
16
17 **Q. PLEASE STATE YOUR CONCLUSIONS REGARDING THE COMPANY'S ROE**
18 **AND ROR.**

19 A. My recommended ROE for the Company is 9.23 percent. When this number is included in
20 the calculation of the ROR, the result is a weighted-average cost of capital of 7.15 percent
21 for Montana-Dakota. See Exhibit MFG-21.

1 **II. UPDATED DCF RETURN ON EQUITY ANALYSIS**

2 **1. Review of the DCF ROE Process**

3 **Q. FOR EASE OF REFERENCE, PLEASE SUMMARIZE YOUR PROCESS FOR**
4 **ESTIMATING AN ROE FOR MONTANA-DAKOTA.**

5 A. I performed a DCF analysis on a group of natural gas distribution utilities comparable to
6 Montana-Dakota that are publicly traded and have similar investment risk. Using proxies
7 to determine an ROE is typical for the DCF process. Therefore, I had to find companies
8 similar in risk to Montana-Dakota to develop the ROE for the Company. The estimated
9 rates of return for members of this group form the basis for my estimate of a fair rate of
10 return for the Company.

11 **Q. HOW DID YOU PROCEED IN FINDING PROXIES FOR MONTANA-DAKOTA?**

12 A. Montana-Dakota does not have an independent Standard & Poor's (S&P) credit rating, but
13 the credit rating for MDU Resources, its parent company, is BBB+, an investment-grade
14 rating. Montana-Dakota is one of four natural-gas distribution companies that are owned
15 and operated by MDU Resources.¹ These four companies, although not a majority of MDU
16 Resources' operations, represent a significant portion. Therefore, the Company's risk
17 profile is reflected S&P's credit rating for MDU Resources, making that BBB+ rating a
18 good surrogate credit rating for Montana-Dakota. In conjunction with the MDU Resources'
19 credit rating, I applied screens, which I described in my Direct Testimony, as I selected
20 companies from Value Line's Natural Gas Utility industry listing for my Comparison
21 Group.

¹ Great Plains Natural Gas Co., Cascade Natural Gas Corp., and Intermountain Gas Co. are the others.
Nicole A. Kivisto, Direct Testimony at 1.

1 **Q. WHAT WAS THE NEXT STEP AFTER THE COMPARISON GROUP WAS**
2 **CREATED?**

3 A. I applied the constant-growth DCF model to the Comparison Group's eight members to
4 determine my recommended ROE for the Company.

5 **Q. HAVE YOU CHANGED THE COMPARISON GROUP MEMBERSHIP FOR THIS**
6 **SURREBUTTAL TESTIMONY?**

7 A. Yes. As Mr. Gorman stated in his Direct Testimony, South Jersey Industries (SJI) entered a
8 definitive agreement to purchase Elizabethtown Gas Company (ETG). One screen for
9 inclusion in the Comparison Group is that a company not be expected to sell, merge into or
10 be acquired by another company, or be engaged in an unusual regulatory proceeding. The
11 SJI-ETG merger has not been completed, so I am excluding SJI from the Comparison
12 Group for my ROE analysis in this testimony.

13 **Q. PLEASE NAME THE COMPANIES THAT REMAIN IN THE COMPARISON**
14 **GROUP.**

15 A. There are seven companies remaining in the Comparison Group. They are Atmos Energy,
16 New Jersey Resources, NiSource, Inc., Northwest Natural Gas, ONE Gas, Inc., Southwest
17 Gas, and Spire, Inc.

18 **Q. IN GENERAL, WHAT IS THE STRUCTURE OF DCF MODELS?**

19 A. The DCF model uses publicly available data for the individual companies' growth-rate
20 estimates, dividends paid, and common-equity prices. I insert these values for each
21 company into the constant-growth DCF equation:

22

23

$$k = \frac{D_1}{P_0} + g$$

1 Where:

2 D_1 is the annual dividend one year from the present;

3 P_0 is the current price of a stock share;

4 g is the growth rate of the dividend; and

5 k is the discount rate and the fair rate of return on equity.

6 The first term on the right-hand side of the equation is the dividend yield and the second term
7 is the dividend growth rate. Together, they produce the estimated ROE for a company.

8 **Q. HOW DID YOU USE THE INFORMATION FOR THE COMPARISON GROUP**
9 **TO DETERMINE YOUR RECOMMENDED ROE FOR MONTANA-DAKOTA?**

10 A. Using the DCF model, I estimated a mean growth rate each company in my Comparison
11 Group. The mean growth rate is the average of the earnings per share (EPS) growth rates
12 from Value Line, Zacks, and Yahoo! Finance with each source weighted equally. Next, I
13 calculated the dividend yield for each company, then adjusted for dividend growth to find
14 the expected dividend yield. I further adjusted the expected dividend yield for flotation
15 costs, then added that value to the mean growth-rate estimate for each company to find
16 individual ROEs.

17 **Q. PLEASE CONTINUE.**

18 A. I checked my DCF ROE results against CAPM results and recent authorized ROEs for
19 natural gas distribution companies, as I did in my Direct Testimony before determining my
20 recommended ROE for the Company

1 **2. Updated DCF Analysis**

2 **Q. WHAT ARE THE DATES OF THE GROWTH-RATE PROJECTIONS WITH**
3 **WHICH YOU CALCULATED THE GROWTH-RATE COMPONENTS OF THE**
4 **COMPARISON GROUP COMPANIES' ROES?**

5 A. My Value Line growth rates were taken from the March 2, 2018 issue of the firm's research
6 reports. See Exhibit MFG-24, Schedule 1. The Zacks and Yahoo! Finance growth rates
7 were taken from those sources' websites on April 16, 2018. See Exhibit MFG-24,
8 Schedule 1.

9 **Q. WHAT ARE THE DATES OF THE EQUITY PRICES YOU USED TO**
10 **CALCULATE THE DIVIDEND-YIELD PORTION OF COMPARISON GROUP**
11 **COMPANIES' ROES?**

12 A. My equity prices are the average of closing prices on the 19 trading days for the period
13 March 19, 2018-April 13, 2018. See Exhibit MFG-22, pages 1-2. This period is long
14 enough to dampen any short-term aberrations in the capital market. It is also close to the
15 May 4, 2018 date of this Testimony, making the prices timely.

16 **Q. WHAT ARE THE DATES OF THE DIVIDENDS YOU USED TO CALCULATE**
17 **THE DIVIDEND-YIELD PORTION OF COMPARISON GROUP COMPANIES'**
18 **ROES?**

19 A. I used the higher of the reported dividends annualized from either Value Line in its March
20 2, 2018 issue, or from Zacks as of April 16, 2018. The two sources report identical
21 dividends for the companies. See Exhibit MFG-23.

1 **Q. DID YOU MAKE ANY ADJUSTMENTS TO THE WEIGHTED-AVERAGE**
2 **GROWTH RATES BEFORE DETERMINING THE DCF ROE OF THE**
3 **COMPARISON GROUP?**

4 A. Yes. Value Line's EPS growth-rate estimate for NiSource, Inc. is 18.00 percent. This
5 projected growth rate is 8.5 percent higher than the next single highest EPS growth rate for
6 any of the Comparison Group companies from any of the three sources. This value is also
7 6-plus percent greater than the highest authorized ROE² awarded any U.S. natural gas
8 company in 2016 and 2017. The next highest award after that in 2016-2017 was 10.10
9 percent. The 18 percent growth rate for Value Line is not a value that any natural gas
10 distribution company in the continental 48 states would have to match as it competed for
11 capital in equity markets. Therefore, I, excluded this growth-rate estimate from my DCF
12 analysis. Instead, I used the weighted average of the Zacks and Yahoo! Finance EPS
13 growth rates for NiSource, similar to what I did for Southwest Gas, which does not have
14 an EPS growth rate from Zacks. See Exhibit MFG-24, Schedule 1.

15 **Q. WHAT ARE THE RESULTS OF YOUR DCF ROE ANALYSIS USING UPDATED**
16 **DATA?**

17 A. The mean ROE for the Comparison Group is 9.23 percent. See Exhibit MFG-21. This value
18 is composed of a mean expected dividend growth rate of 6.10 percent and a mean flotation-
19 adjusted expected dividend yield of 3.13 percent.

² ENSTAR Natural Gas Cop. Of Alaska received an 11.88 percent authorized ROE in 2017. However, ENSTAR's operations in Alaska include pipelines, meaning the ROE is not reflective of an award to a true natural gas distribution company.

1 **Q. DID YOU ALSO UPDATE YOUR MULTISTAGE DCF ANALYSIS FOR THE**
2 **COMPARISON GROUP?**

3 A. Yes. I updated the multistage DCF analysis, with one modification from the method I used
4 in my Direct Testimony. Whereas I previously assumed that the long-term growth rate
5 would be equal to the Congressional Budget Office (CBO) long-term forecast for nominal
6 GDP growth, in this testimony I added the long-term estimate of GDP by the U.S. Energy
7 Information Administration (EIA) to the calculation. The CBO estimate is 3.9 percent and
8 the EIA estimate is 4.3 percent. See Exhibit MFG-24, Schedules 2 and 3. I averaged the
9 two GDP growth estimates in my analysis and applied that average (4.1 percent) to my
10 multistage DCF analysis. See Exhibit MFG-24, Schedule 4.

11 **Q. WHAT IS THE RESULT OF YOUR UPDATED MULTISTAGE DCF ANALYSIS?**

12 A. The ROE for the Comparison Group from the multistage DCF analysis is 8.50 percent. See
13 Exhibit MFG-24, Schedule 4.

14 **3. The DCF Model and the 2017 Tax Cuts and Jobs Act (TCJA)**

15 **Q. DOES THE DCF MODEL CAPTURE THE EFFECT OF THE TCJA?**

16 A. Yes. Any effects of the TCJA, which was signed into law on December 22, 2017, on the
17 natural-gas distribution utilities in the Comparison Group are captured through common
18 equity share prices.

19 **Q. DOES YOUR UPDATED DCF ROE ANALYSIS REFLECT THE EFFECT OF THE**
20 **TCJA?**

21 A. It is difficult to assign all responsibility to one factor when considering movements in
22 common equity share prices, but it is true that average share prices for all the companies in
23 the Comparison Group were lower in the updated DCF analysis than they were in the

1 analysis conducted in my Direct Testimony. The effect of this decrease in share prices
2 causes the dividend-yield component of the DCF model, all other things equal, to increase.
3 With the adjustments since my direct testimony, the flotation-adjusted expected dividend
4 yield for the Comparison Group rose from 2.78 percent in my Direct Testimony to 3.13
5 percent.

6 **Q. PLEASE COMMENT ON THIS DIVIDEND YIELD INCREASE.**

7 A. The change in the dividend yield demonstrates that the DCF model is working. The change
8 in the investing environment caused by the passage of the TCJA occurred in the period
9 following my first DCF analysis and my updated DCF analysis. Investors have had time to
10 consider the projected effect of the TJCA on utilities, including natural-gas distribution
11 utilities, and have responded by reducing the price they are willing to pay for these common
12 equity shares.

13 **III. UPDATED CAPM RETURN ON EQUITY ANALYSIS**

14 **Q. PLEASE RESTATE THE ROLE OF THE CAPM IN YOUR ROE ANALYSIS.**

15 A. I use the CAPM as a check on the reasonableness of my DCF ROE analysis outcome. As
16 noted in my Direct Testimony, the possible input values for the riskless asset, beta, and
17 market risk premium can vary considerably.

18 **Q. DID YOU UPDATE THE CAPITAL ASSET PRICING MODEL (CAPM) ROE
19 ANALYSIS YOU PERFORMED IN YOUR DIRECT TESTIMONY?**

20 A. Yes. I updated the calculation of my CAPM ROE using the methods I employed in my
21 Direct Testimony. Responding to the comments of Dr. Gaske regarding the use of Value
22 Line's Median Price Appreciation Potential as an input in determining the market risk

1 premium component of the CAPM, I included additional inputs for the market risk
2 premium.

3 **Q. WHAT ADDITIONAL MARKET RISK PREMIUM INDICATORS DID YOU**
4 **INCLUDE IN THE UPDATED CAPM ANALYSIS.**

5 A. I introduced Dr. Gaske's 12.54 percent S&P 500 market return and Mr. Gorman's high
6 market risk premium estimate of 78.0 percent.

7 **Q. PLEASE REVIEW YOUR UPDATE OF YOUR CAPM ROE ANALYSIS.**

8 A. The updating process included using the average closing yield (3.04 percent) on a 30-year
9 Treasury bond for March 19, 2018-April 13, 2018 as my riskless asset rate. See Exhibit
10 MFG-25, Schedule 1. I also used the average (0.71) of the adjusted Betas for each company
11 as published in the Value Line Research Reports of March 2, 2018. See Exhibit MFG-25,
12 Schedule 2. To update the market risk premium, I used the Value Line April 13, 2018
13 Summary and Index, which forecasts aggregate dividend yields and growth rates for the broad
14 economy (1,700 stocks in the "Value Line Universe"). Value Line forecasts the dividend
15 yield (2.0 percent) and the 3- to 5-year appreciation potential (45 percent) for these
16 companies. MFG-25, Schedule 3. These inputs yield a market risk premium of 8.69 percent.
17 See Exhibit MFG-25, Schedule 4.

18 **Q. WHAT MARKET RISK PREMIUM DOES DR. GASKE'S S&P 500 MARKET**
19 **RETURN PRODUCE?**

20 A. Dr. Gaske's 12.54 percent S&P 500 market return produces a market risk premium of 9.50
21 percent when combined with my risk-free rate of 3.04 percent.³ See Exhibit MFG-25,
22 Schedule 4.

³ I showed in my Direct Testimony that risk-free rates based on forecasted Treasury bond yields overstate the risk-free rate. See Griffing Direct 42-43. Since 2015, the *Blue Chip Economic Indicators* forecasts

1 **Q. DO YOU ADJUST MR. GORMAN'S HIGH MARKET RETURN ESTIMATE?**

2 A. Yes. Mr. Gorman's 7.80 percent high market risk premium estimate is based on a risk-free
3 rate of 3.60 percent. When adjusted for my risk-free rate of 3.04 percent, his high market
4 risk premium becomes 8.34 percent. See Exhibit MFG-25, Schedule 4.

5 **Q. WHAT IS THE OUTCOME OF YOUR UPDATED CAPM ROE UPDATE?**

6 A. My updated CAPM ROE is 9.25 percent, while my updated ECAPM ROE is 9.87 percent.
7 See Exhibit MFG-25, Schedule 4.

8 **Q. WHAT ARE THE CAPM ROE OUTCOMES USING DR. GASKE'S AND MR.
9 GORMAN'S MARKET RISK PREMIUMS IN YOUR CAPM ANALYSIS?**

10 A. Dr. Gaske's CAPM ROE is 9.83 percent. The CAPM ROE for Mr. Gorman is 9.00 percent.
11 See Exhibit MFG-25, Schedule 4.

12 **Q. DOES THE CAPM MODEL CAPTURE THE EFFECT OF THE TCJA?**

13 A. Yes. The TCJA influences the CAPM through the β term. This term reflects how the share
14 price of an individual utility moves compared with the rest of the equity market.
15 Reviewing, a β of 1 means the utility share price is moving just like the market, a $\beta > 1$
16 means the utility share price is more volatile than the market, and a $\beta < 1$ means the utility
17 share price is less volatile than the market. Therefore, the movement of the common equity
18 share prices of the seven companies in the Comparison Group since the TJCA was passed
19 are reflected in β .

have exceeded actual ensuing yields by 63 to 113 basis points. See Exhibit MFG-17, Updated, Exhibit MFG-18, Updated. Dr. Gaske and Mr. Gorman relied on *Blue Chip* forecasts. Therefore, their risk-free rates are too high. I use the current average of the 30-year Treasury bond yield as my risk-free rate. See Exhibit MFG-25, Schedule 1. This average reflects investors' beliefs about future interest rates.

1 **Q. PLEASE RESTATE THE VALUES OF THE AUTHORIZED ROES STUDY YOU**
2 **PRESENTED IN YOUR DIRECT TESTIMONY?**

3 A. The 2017 values, excluding the outlier ENSTAR award in Alaska, are a mean of 9.48
4 percent, median of 9.50 percent and range of 8.70 percent to 10.10 percent. For 2016, the
5 results are a mean of 9.59 percent, median of 9.50 percent and range of 9.11 percent to
6 10.10 percent. All inputs to the study were taken from the Regulatory Research Associates
7 case history. See Exhibit MFG-15.

8
9 **IV. RESPONSE TO DR GASKE'S CRITICISMS OF THE NDPSO STAFF'S ROE**
10 **ANALYSIS**

11 **Q. DOES DR. GASKE MAKE CRITICISMS OF YOUR ROE ANALYSIS TO WHICH**
12 **YOU WANT TO RESPOND?**

13 A. Yes. I respond to Dr. Gaske regarding the:

- 14 1. use of GDP growth-rate estimates in my multistage DCF analysis;
- 15 2. correct adjustment for flotation costs in the DCF model;
- 16 3. market risk premium data used in my CAPM ROE analysis; and
- 17 4. role of size in determining risk for a regulated utility; and
- 18 5. activities of the Federal Reserve in financial markets.

1 **1. Use of GDP Growth-Rate Estimates in Multistage DCF Analysis**

2 **Q. WHAT CRITICISM DID DR. GASKE MAKE OF USING LONG-TERM GDP**
3 **GROWTH-RATE ESTIMATES AS INPUTS IN MULTISTAGE DCF ANALYSIS?**

4 A. Dr. Gaske asserts that the U.S. GDP growth rate has little or no connection to the growth
5 rates that investors expect. He states that industries can grow faster than the economy for
6 significant periods of time.

7 **Q. PLEASE DISCUSS THE USE OF LONG-TERM GDP GROWTH-RATE**
8 **ESTIMATES AS INPUTS IN MULTISTAGE DCF ANALYSIS.**

9 A. The multistage analysis joins short-term growth-rate estimates and long-term growth rate
10 estimates. An industry's growth rate may exceed the growth-rate of the economy for a time,
11 but the growth rate of mature industries such as natural-gas distribution companies
12 converge to the growth rate of the economy. Mr. Gorman supports this statement on pages
13 37-39 of his Direct Testimony. He cites academic studies that support the convergence
14 hypothesis and data that demonstrate the growth of electric utilities and energy use have
15 trailed growth in real GDP over the period 1988-2018. I agree with Mr. Gorman that long-
16 term GDP growth-rate estimates are appropriate to use as the proxy for the long-term
17 growth rate in multistage DCF analysis.

1 2. **The Correct Adjustment for Flotation Costs**

2 **Q. DOES DR. GASKE CONTINUE TO ARGUE FOR AN APPLICATION OF**
3 **FLOTATION COSTS THAT INCORRECTLY OVERSTATES THE SIZE OF THE**
4 **ADJUSTMENT FOR THOSE COSTS?**

5 A. Yes. Dr. Gaske continues to assert in his Rebuttal Testimony that Equation (1) is the correct
6 tool for making a cost to the ROE of a company for the issuance costs it incurs in floating
7 securities.

8 (1) $k = \left(\frac{D_1}{P_0} + g\right)(1 + f)$

9 I responded in my Direct Testimony by showing that Equation (2) is the correct approach
10 for making a flotation-cost adjustment.

11 (2) $k = \frac{D_1}{P_0} \left(\frac{1}{1-f}\right) + g$

12 By comparing the two equations, it can be seen that Dr. Gaske applies the flotation cost
13 factor (“f”) to the dividend-yield term, which is appropriate, and to the growth-rate term,
14 which is not. See Exhibit MFG-26. When Dr. Gaske’s incorrect Equation (1) is applied to
15 the inputs used in my DCF ROE analysis, the result is 21 basis points greater than my DCF
16 result using the correct equation. See Exhibit MFG-24, Schedule 5.

17 **Q. HOW DOES DR. GASKE SUPPORT HIS POSITION ABOUT FLOTATION**
18 **COSTS?**

19 A. Dr. Gaske states that the flotation-cost adjustment is explicitly designed to increase the
20 stock price by an amount sufficient to allow the regulated utility to issue common stock
21 without diluting the value of the existing investment.

1 **Q. DO YOU AGREE WITH DR. GASKE THAT THE PURPOSE OF FLOTATION**
2 **COSTS IS TO MAINTAIN THE STOCK PRICE OF A COMPANY ISSUING**
3 **EQUITY?**

4 A. No. The purpose of the flotation-cost adjustment is to allow a company to recover its costs
5 of issuing equity, not to maintain any specific share price. These costs are just like any
6 other expense of a utility and the utility deserves to recover them. Dr. Roger Morin, the
7 author of *New Regulatory Finance*, an authoritative handbook regarding public utility
8 regulation, states that the reason the flotation adjustment is applied to only the dividend
9 yield of the DCF formula and not to the growth component is because “flotation costs are
10 incurred only when new stock is sold, and not when earnings are retained.”⁴ In other words,
11 when a company’s equity increases due to retained earnings, no costs are incurred by the
12 company, unlike when the equity growth occurs due to issuing new equity.

13 **Q. CAN THE USE OF EQUATION (2) TO RECOVER FLOTATION COSTS RESULT**
14 **IN DIFFERENT RETURNS FOR COMPANIES WITH DIFFERENT DIVIDEND**
15 **YIELDS?**

16 A. Yes. Dr. Gaske presents an example on page 41 of his Rebuttal Testimony showing that
17 two firms with identical risks and required rates of return on common equity. He assumes
18 that the companies have different dividend yields and expected growth rates, then shows
19 that these two firms would receive different adjustments for flotation costs. Dr. Gaske
20 asserts that because the firms have identical risks that they should have the same net return
21 on equity after flotation costs adjustments are made.

⁴ Morin, Roger A. *New Regulatory Finance*. Page 336. Vienna, Virginia. 2006. Exhibit MFG-26.

1 **Q. IS DR. GASKE CORRECT THAT THESE TWO FIRMS SHOULD HAVE**
2 **IDENTICAL NET ROES?**

3 A. No. In fact, the different flotation cost adjustments shown in Dr. Gaske's example are to
4 be expected. As Dr. Morin says, "the larger the fraction of earnings retained, the higher the
5 growth rate, the lower the dividend yield component, and the smaller the flotation costs
6 adjustment."⁵ The two companies in Dr. Gaske's example should have different net ROEs
7 because they have made different decisions about how much of earnings to retain and how
8 much to pay out in dividends. Their identical risk is irrelevant to the size of the flotation
9 cost adjustment.

10 **3. CAPM Market Risk Premium Data**

11 **Q. PLEASE COMMENT ON DR. GASKE'S CRITICISM OF USING VALUE LINE'S**
12 **3- TO 5-YEAR PRICE APPRECIATION POTENTIAL VALUE TO DETERMINE**
13 **A MARKET RETURN IN A CAPM ANALYSIS.**

14 A. Dr. Gaske is correct that the price-appreciation potential value can be sensitive to market
15 price changes.⁶ In response to his criticism, I have adopted his S&P 500 market return
16 value and Mr. Gorman's high estimate of the market risk premium for use in CAPM
17 analysis.

⁵ Morin. Page 336. Exhibit MFG-26.

⁶ The volatility of the price-appreciation potential percentage has not prevented other analysts from using it in their CAPM ROE analyses. See, for example, Exhibit PT-16 of Paul Moul, Schedule 12, Page 2 of 3, *In the Matter of the Petition of New Jersey-American Water Company, Inc. for Approval of Increased Tariff Rates and Charges for Water and Wastewater Service, Increased Depreciation Rates and Other Tariff Revisions*, (New Jersey) BPU Docket No. WR17090985, and Direct Testimony of Roger A. Morin, PhD on behalf of Oklahoma Gas and Electric Company, Page 33 of 57, *In the Matter of the Application of Oklahoma Gas and Electric Company for an Order of the (Oklahoma Commerce) Commission Authorizing Applicant to Modify Its Rates, Charges, and Tariffs for Retail Electric Serviced in Oklahoma*, Cause No. PUD 201700496

1 **Q. WHAT ARE THE OUTCOMES OF USING DR. GASKE'S MARKET RISK**
2 **PREMIUM INPUT AND MR. GORMAN'S RISK PREMIUM INPUT RELATIVE**
3 **TO YOUR ANALYSIS.**

4 A. As presented above, using Dr. Gaske's input results in my CAPM ROE analysis results in
5 an ROE of 9.83 percent, using Mr. Gorman's input results in an ROE of 9.00 percent, while
6 my CAPM ROE is 9.25 percent.

7 **Q. PLEASE COMMENT.**

8 A. The results demonstrate the sensitivity of the CAPM to the chosen inputs of the analyst
9 conducting the CAPM ROE result. The range of the above outcomes where I have held
10 Beta and the risk-free rate constant, is 83 basis points. If these other variables are allowed
11 to change, the range becomes even larger. This is why I use CAPM results only as a check
12 on my DCF results. CAPM continues to support my DCF analysis.

13 **4. Size and Risk for a Public Utility**

14 **Q. PLEASE DISCUSS SIZE AND RISK FOR PUBLIC UTILITIES.**

15 A. Dr. Gaske continues to assert that Montana-Dakota deserves a size adjustment of at least
16 100 basis points. I have shown in my Direct Testimony that the Company has shared
17 operations with three other natural gas distribution companies within MDU Resources.
18 These units benefit from shared back-office operations and purchasing agreements, among
19 other benefits. Therefore, the Company's effective size is larger than its individual metrics
20 indicate. The Company is also a near-monopoly in its service territory. This means it is not
21 subject to same risks that a firm of the same size operating in a competitive industry is. The
22 Duff&Phelps size deciles that Dr. Gaske references to support his proposed size adjustment

1 are for all companies included in the study, the majority of which are in competitive
2 industries.

3 **Q. PLEASE CONTINUE.**

4 A. Dt. Gaske states that if MDU Resources sold Montana-Dakota or purchased utilities in
5 other jurisdictions that the risk of the operation would not change. This position is
6 inconsistent with Dr. Gaske's treatment of the natural-gas distribution companies in his
7 Proxy Group when he conducts a size analysis.

8 **Q. PLEASE ELABORATE.**

9 A. Dr. Gaske stated in his Direct Testimony that the proxy companies were between 16 and
10 41 times the size of Montana-Dakota's operations. See Gaske Direct 32. For example,
11 Atmos Energy and NiSource, Inc., the two largest Proxy Group companies have regulated
12 gas operations in eight and seven states, respectively. Following Dr. Gaske's logic that the
13 risk of any one of these operations is unaffected by the fact that the parent company
14 operates in several jurisdictions, the appropriate size measure should be the capitalizations
15 of the operating companies, not the aggregate capitalization of the parent company. Dr.
16 Gaske, however, compares Montana-Dakota with the parent companies, while arguing that
17 Montana-Dakota's shared operations with the other MDU natural-gas operating divisions
18 should not be considered in establishing its size.

1 **5. Federal Reserve Activities in U.S. Financial Markets**

2 **Q. DR. GASKE ASSERTS THAT FEDERAL RESERVE ACTIVITIES IN RECENT**
3 **YEARS HAVE CAUSED THE DCF MODEL TO UNDERSTATE THE COST OF**
4 **COMMON EQUITY CAPITAL FOR UTILITIES AT THIS TIME.**

5 A. The Federal Reserve (“the Fed”) has taken steps in response to the Great Recession of
6 2007-2009 to stimulate the U.S. economy. Dr. Gaske asserts that these actions have
7 “artificially” reduced current dividend yields for utilities, a source of the DCF model
8 understating ROEs.

9 **Q. PLEASE RESPOND TO DR. GASKE’S ASSERTIONS ABOUT THE INFLUENCE**
10 **OF THE FEDERAL RESERVE ON PUBLIC UTILITY ROES.**

11 A. The Fed’s actions to keep interest rates low to stimulate the economy have not only
12 succeeded in doing that, but they have also propped up demand in the economy.
13 Consequently, demand for natural gas and other products have been higher than they would
14 have been without the Fed’s actions. Therefore, the EPS growth-rate estimates for the
15 companies in the Comparison Group have been higher than they would have been in an
16 economy where demand remained sluggish. Lower EPS growth estimates also would have
17 resulted in lower cost of capital results from the DCF model.

18 **Q. IS THE FED UNWINDING ITS BALANCE SHEET?**

19 A. Yes. The Fed announced in the fall of 2017 that it would begin unwinding its balance sheet
20 by not reinvesting the principal from maturing Treasury bonds and mortgage-backed
21 securities that it owns. The Fed will not reduce its balance sheet to the \$800 billion it was
22 at before the Great Recession. Former Fed Chair Ben Bernanke recently said that it is likely

1 the Fed will move its balance sheet to the range of \$2.3 trillion to \$2.8 trillion.⁷ Even so,
2 the unwinding will take at least three more years to complete at the fastest pace the Fed has
3 allowed for. Financial markets will have a chance to gradually absorb the changes, so
4 dramatic changes in interest rates and equity values are unlikely in response to Fed actions.
5

6 **V. RECOMMENDED ROE AND OVERALL RATE OF RETURN**

7 **Q. WHAT ROE DO YOU RECOMMEND FOR MONTANA-DAKOTA?**

8 A. My recommended ROE is 9.23 percent. This value is almost identical my CAPM ROE
9 result of 9.25 percent. It is between the CAPM ROEs of Dr. Gaske and Mr. Gorman I
10 developed using their market risk premium inputs. My multistage DCF analysis is much
11 lower than this value, while my ECAPM ROE result is much higher than this result., thus
12 offsetting one another. Finally, 9.23 percent falls with the range of authorized ROEs
13 awarded natural gas distribution companies in fully litigated rate cases in 2016 and 2017.
14 See Exhibit MFG-15.

15 **Q. WHAT OVERALL RATE OF RETURN DO YOU RECOMMEND FOR THE**
16 **COMPANY?**

17 A. Using my recommended ROE, and the Company's cost of debt and capital structure, I
18 recommend an overall rate of return of 7.15 percent for the Company. See Exhibit
19 MFG-21.
20

⁷ See Exhibit MFG-27. Evelyn Cheng, CNBC, May 1, 2018.

1 **VI. SUMMARY**

2 **Q. WHAT ARE THE CRITERIA THE COMMISSION SHOULD CONSIDER IN**
3 **SETTING THE COMPANY'S ROE AND ROR?**

4 A. The Commission should only consider whether the ROE and ROR meet the *Bluefield* and
5 *Hope* criteria for a fair return. Recounting, these criteria include returns commensurate with
6 returns being earned on other investments with equivalent risks, rate of return sufficient to
7 enable the utility to attract capital, and returns sufficient to enable the regulated company
8 to maintain its credit rating and financial integrity. The interpretation of the *Hope* and
9 *Bluefield* criteria is that a company should be given the opportunity to earn an ROE and
10 ROR sufficient to meet these standards.

11 **Q. WHAT DOES YOUR ROE ANALYSIS REFLECT?**

12 A. My ROE analysis reflects the latest views of investors regarding the prospects of the
13 Comparison Group companies. I have shown that the outcome of my forward-looking
14 DCF analysis is compatible with recent ROE awards to natural gas utilities and that the
15 CAPM results do not indicate my recommendations should be higher.

16 **Q. WHAT IS YOUR RECOMMENDED RETURN ON EQUITY AND OVERALL**
17 **COST OF CAPITAL?**

18 A. I recommend a return on equity of 9.23 percent and an overall rate of return of 7.15 percent.

19 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

20 A. Yes.

Sources: 30-year Treasuries-<http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2014>
 Federal funds rate-<https://www.federalreserve.gov/monetarypolicy/openmarket.htm>

Bold type indicates days the Federal Reserve's Open Market Committee met or the federal funds target rate changed.

Date	30-year Treasury rate	Federal Funds rate	Date	30-year Treasury rate	Federal Funds rate
1/3/2017	3.04	0.50-0.75	4/3/2017	2.98	0.75-1.00
1/4/2017	3.05	0.50-0.75	4/4/2017	2.99	0.75-1.00
1/5/2017	2.96	0.50-0.75	4/5/2017	2.98	0.75-1.00
1/6/2017	3.00	0.50-0.75	4/6/2017	2.99	0.75-1.00
1/9/2017	2.97	0.50-0.75	4/7/2017	3.00	0.75-1.00
1/10/2017	2.97	0.50-0.75	4/10/2017	2.99	0.75-1.00
1/11/2017	2.96	0.50-0.75	4/11/2017	2.93	0.75-1.00
1/12/2017	3.01	0.50-0.75	4/12/2017	2.92	0.75-1.00
1/13/2017	2.99	0.50-0.75	4/13/2017	2.89	0.75-1.00
1/17/2017	2.93	0.50-0.75	4/17/2017	2.92	0.75-1.00
1/18/2017	3.00	0.50-0.75	4/18/2017	2.84	0.75-1.00
1/19/2017	3.04	0.50-0.75	4/19/2017	2.87	0.75-1.00
1/20/2017	3.05	0.50-0.75	4/20/2017	2.89	0.75-1.00
1/23/2017	2.99	0.50-0.75	4/21/2017	2.89	0.75-1.00
1/24/2017	3.05	0.50-0.75	4/24/2017	2.93	0.75-1.00
1/25/2017	3.10	0.50-0.75	4/25/2017	2.99	0.75-1.00
1/26/2017	3.08	0.50-0.75	4/26/2017	2.97	0.75-1.00
1/27/2017	3.06	0.50-0.75	4/27/2017	2.96	0.75-1.00
1/30/2017	3.08	0.50-0.75	4/28/2017	2.96	0.75-1.00
1/31/2017	3.05	FOMC Hold 0.50-0.75	5/1/2017	3.00	0.75-1.00
2/1/2017	3.08	FOMC Hold 0.50-0.75	5/2/2017	2.97	FOMC Hold 0.75-1.00
2/2/2017	3.09	0.50-0.75	5/3/2017	2.97	FOMC Hold 0.75-1.00
2/3/2017	3.11	0.50-0.75	5/4/2017	3.00	0.75-1.00
2/6/2017	3.05	0.50-0.75	5/5/2017	2.99	0.75-1.00
2/7/2017	3.02	0.50-0.75	5/8/2017	3.02	0.75-1.00
2/8/2017	2.96	0.50-0.75	5/9/2017	3.04	0.75-1.00
2/9/2017	3.02	0.50-0.75	5/10/2017	3.03	0.75-1.00
2/10/2017	3.01	0.50-0.75	5/11/2017	3.03	0.75-1.00
2/13/2017	3.03	0.50-0.75	5/12/2017	2.98	0.75-1.00
2/14/2017	3.07	0.50-0.75	5/15/2017	3.00	0.75-1.00
2/15/2017	3.09	0.50-0.75	5/16/2017	2.99	0.75-1.00
2/16/2017	3.05	0.50-0.75	5/17/2017	2.91	0.75-1.00
2/17/2017	3.03	0.50-0.75	5/18/2017	2.90	0.75-1.00
2/21/2017	3.04	0.50-0.75	5/19/2017	2.90	0.75-1.00
2/22/2017	3.04	0.50-0.75	5/22/2017	2.91	0.75-1.00
2/23/2017	3.02	0.50-0.75	5/23/2017	2.95	0.75-1.00
2/24/2017	2.95	0.50-0.75	5/24/2017	2.92	0.75-1.00
2/27/2017	2.98	0.50-0.75	5/25/2017	2.92	0.75-1.00
2/28/2017	2.97	0.50-0.75	5/26/2017	2.92	0.75-1.00
3/1/2017	3.06	0.50-0.75	5/30/2017	2.88	0.75-1.00
3/2/2017	3.09	0.50-0.75	5/31/2017	2.87	0.75-1.00
3/3/2017	3.08	0.50-0.75	6/1/2017	2.87	0.75-1.00
3/6/2017	3.10	0.50-0.75	6/2/2017	2.80	0.75-1.00
3/7/2017	3.11	0.50-0.75	6/5/2017	2.84	0.75-1.00
3/8/2017	3.15	0.50-0.75	6/6/2017	2.81	0.75-1.00
3/9/2017	3.19	0.50-0.75	6/7/2017	2.84	0.75-1.00
3/10/2017	3.16	0.50-0.75	6/8/2017	2.85	0.75-1.00
3/13/2017	3.20	0.50-0.75	6/9/2017	2.86	0.75-1.00
3/14/2017	3.17	FOMC Raise 0.50-0.75	6/12/2017	2.86	0.75-1.00
3/15/2017	3.11	FOMC Raise 0.50-0.75	6/13/2017	2.87	FOMC Raise 0.75-1.00
3/16/2017	3.14	0.75-1.00	6/14/2017	2.79	FOMC Raise 0.75-1.00
3/17/2017	3.11	0.75-1.00	6/15/2017	2.78	1.00-1.25
3/20/2017	3.08	0.75-1.00	6/16/2017	2.78	1.00-1.25
3/21/2017	3.04	0.75-1.00	6/19/2017	2.79	1.00-1.25
3/22/2017	3.02	0.75-1.00	6/20/2017	2.74	1.00-1.25
3/23/2017	3.02	0.75-1.00	6/21/2017	2.73	1.00-1.25
3/24/2017	3.00	0.75-1.00	6/22/2017	2.72	1.00-1.25
3/27/2017	2.98	0.75-1.00	6/23/2017	2.71	1.00-1.25
3/28/2017	3.02	0.75-1.00	6/26/2017	2.70	1.00-1.25
3/29/2017	2.99	0.75-1.00	6/27/2017	2.75	1.00-1.25
3/30/2017	3.03	0.75-1.00	6/28/2017	2.77	1.00-1.25
3/31/2017	3.02	0.75-1.00	6/29/2017	2.82	1.00-1.25
			6/30/2017	2.84	1.00-1.25
2017Q1 Mean	3.05		2017Q2 Mean	2.90	

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7/3/2017	2.86	1.00-1.25	10/2/2017	2.87	1.00-1.25
7/5/2017	2.85	1.00-1.25	10/3/2017	2.87	1.00-1.25
7/6/2017	2.90	1.00-1.25	10/4/2017	2.87	1.00-1.25
7/7/2017	2.93	1.00-1.25	10/5/2017	2.89	1.00-1.25
7/10/2017	2.93	1.00-1.25	10/6/2017	2.91	1.00-1.25
7/11/2017	2.92	1.00-1.25	10/10/2017	2.88	1.00-1.25
7/12/2017	2.89	1.00-1.25	10/11/2017	2.88	1.00-1.25
7/13/2017	2.92	1.00-1.25	10/12/2017	2.86	1.00-1.25
7/14/2017	2.91	1.00-1.25	10/13/2017	2.81	1.00-1.25
7/17/2017	2.89	1.00-1.25	10/16/2017	2.82	1.00-1.25
7/18/2017	2.85	1.00-1.25	10/17/2017	2.80	1.00-1.25
7/19/2017	2.85	1.00-1.25	10/18/2017	2.85	1.00-1.25
7/20/2017	2.83	1.00-1.25	10/19/2017	2.83	1.00-1.25
7/21/2017	2.81	1.00-1.25	10/20/2017	2.89	1.00-1.25
7/24/2017	2.83	1.00-1.25	10/23/2017	2.89	1.00-1.25
7/25/2017	2.91	FOMC Hold 1.00-1.25	10/24/2017	2.92	1.00-1.25
7/26/2017	2.89	1.00-1.25	10/25/2017	2.95	1.00-1.25
7/27/2017	2.93	1.00-1.25	10/26/2017	2.96	1.00-1.25
7/28/2017	2.89	1.00-1.25	10/27/2017	2.93	1.00-1.25
7/31/2017	2.89	1.00-1.25	10/30/2017	2.88	1.00-1.25
8/1/2017	2.86	1.00-1.25	10/31/2017	2.88	FOMC Hold 1.00-1.25
8/2/2017	2.85	1.00-1.25	11/1/2017	2.85	FOMC Hold 1.00-1.25
8/3/2017	2.81	1.00-1.25	11/2/2017	2.83	1.00-1.25
8/4/2017	2.84	1.00-1.25	11/3/2017	2.82	1.00-1.25
8/7/2017	2.84	1.00-1.25	11/6/2017	2.80	1.00-1.25
8/8/2017	2.86	1.00-1.25	11/7/2017	2.77	1.00-1.25
8/9/2017	2.82	1.00-1.25	11/8/2017	2.79	1.00-1.25
8/10/2017	2.79	1.00-1.25	11/9/2017	2.81	1.00-1.25

ROE and ROR Analysis for Montana-Dakota Utilities
 30-Year Treasury Interest Rates, January 1, 2017-March 29, 2018

Docket No. PU-17-295
 Exhibit MFG-18, Updated

Sources: 30-year Treasuries-<http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2014>
 Federal funds rate-<https://www.federalreserve.gov/monetarypolicy/openmarket.htm>

Bold type indicates days the Federal Reserve's Open Market Committee met or the federal funds target rate changed.

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1/3/2017	3.04	0.50-0.75	4/3/2017	2.98	0.75-1.00
1/4/2017	3.05	0.50-0.75	4/4/2017	2.99	0.75-1.00
1/5/2017	2.96	0.50-0.75	4/5/2017	2.98	0.75-1.00
1/6/2017	3.00	0.50-0.75	4/6/2017	2.99	0.75-1.00
1/9/2017	2.97	0.50-0.75	4/7/2017	3.00	0.75-1.00
1/10/2017	2.97	0.50-0.75	4/10/2017	2.99	0.75-1.00
1/11/2017	2.96	0.50-0.75	4/11/2017	2.93	0.75-1.00
1/12/2017	3.01	0.50-0.75	4/12/2017	2.92	0.75-1.00
1/13/2017	2.99	0.50-0.75	4/13/2017	2.89	0.75-1.00
1/17/2017	2.93	0.50-0.75	4/17/2017	2.92	0.75-1.00
1/18/2017	3.00	0.50-0.75	4/18/2017	2.84	0.75-1.00
1/19/2017	3.04	0.50-0.75	4/19/2017	2.87	0.75-1.00
1/20/2017	3.05	0.50-0.75	4/20/2017	2.89	0.75-1.00
1/23/2017	2.99	0.50-0.75	4/21/2017	2.89	0.75-1.00
1/24/2017	3.05	0.50-0.75	4/24/2017	2.93	0.75-1.00
1/25/2017	3.10	0.50-0.75	4/25/2017	2.99	0.75-1.00
1/26/2017	3.08	0.50-0.75	4/26/2017	2.97	0.75-1.00
1/27/2017	3.06	0.50-0.75	4/27/2017	2.96	0.75-1.00
1/30/2017	3.08	0.50-0.75	4/28/2017	2.96	0.75-1.00
1/31/2017	3.05	FOMC Hold 0.50-0.75	5/1/2017	3.00	0.75-1.00
2/1/2017	3.08	FOMC Hold 0.50-0.75	5/2/2017	2.97	FOMC Hold 0.75-1.00
2/2/2017	3.09	0.50-0.75	5/3/2017	2.97	FOMC Hold 0.75-1.00
2/3/2017	3.11	0.50-0.75	5/4/2017	3.00	0.75-1.00
2/6/2017	3.05	0.50-0.75	5/5/2017	2.99	0.75-1.00
2/7/2017	3.02	0.50-0.75	5/8/2017	3.02	0.75-1.00
2/8/2017	2.96	0.50-0.75	5/9/2017	3.04	0.75-1.00
2/9/2017	3.02	0.50-0.75	5/10/2017	3.03	0.75-1.00
2/10/2017	3.01	0.50-0.75	5/11/2017	3.03	0.75-1.00
2/13/2017	3.03	0.50-0.75	5/12/2017	2.98	0.75-1.00
2/14/2017	3.07	0.50-0.75	5/15/2017	3.00	0.75-1.00
2/15/2017	3.09	0.50-0.75	5/16/2017	2.99	0.75-1.00
2/16/2017	3.05	0.50-0.75	5/17/2017	2.91	0.75-1.00
2/17/2017	3.03	0.50-0.75	5/18/2017	2.90	0.75-1.00
2/21/2017	3.04	0.50-0.75	5/19/2017	2.90	0.75-1.00
2/22/2017	3.04	0.50-0.75	5/22/2017	2.91	0.75-1.00
2/23/2017	3.02	0.50-0.75	5/23/2017	2.95	0.75-1.00
2/24/2017	2.95	0.50-0.75	5/24/2017	2.92	0.75-1.00
2/27/2017	2.98	0.50-0.75	5/25/2017	2.92	0.75-1.00
2/28/2017	2.97	0.50-0.75	5/26/2017	2.92	0.75-1.00
3/1/2017	3.06	0.50-0.75	5/30/2017	2.88	0.75-1.00
3/2/2017	3.09	0.50-0.75	5/31/2017	2.87	0.75-1.00
3/3/2017	3.08	0.50-0.75	6/1/2017	2.87	0.75-1.00
3/6/2017	3.10	0.50-0.75	6/2/2017	2.80	0.75-1.00
3/7/2017	3.11	0.50-0.75	6/5/2017	2.84	0.75-1.00
3/8/2017	3.15	0.50-0.75	6/6/2017	2.81	0.75-1.00
3/9/2017	3.19	0.50-0.75	6/7/2017	2.84	0.75-1.00
3/10/2017	3.16	0.50-0.75	6/8/2017	2.85	0.75-1.00
3/13/2017	3.20	0.50-0.75	6/9/2017	2.86	0.75-1.00
3/14/2017	3.17	FOMC Raise 0.50-0.75	6/12/2017	2.86	0.75-1.00
3/15/2017	3.11	FOMC Raise 0.50-0.75	6/13/2017	2.87	FOMC Raise 0.75-1.00
3/16/2017	3.14	FOMC Raise 0.75-1.00	6/14/2017	2.79	FOMC Raise 0.75-1.00
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3/20/2017	3.08	0.75-1.00	6/16/2017	2.78	1.00-1.25
3/21/2017	3.04	0.75-1.00	6/19/2017	2.79	1.00-1.25
3/22/2017	3.02	0.75-1.00	6/20/2017	2.74	1.00-1.25
3/23/2017	3.02	0.75-1.00	6/21/2017	2.73	1.00-1.25
3/24/2017	3.00	0.75-1.00	6/22/2017	2.72	1.00-1.25
3/27/2017	2.98	0.75-1.00	6/23/2017	2.71	1.00-1.25
3/28/2017	3.02	0.75-1.00	6/26/2017	2.70	1.00-1.25
3/29/2017	2.99	0.75-1.00	6/27/2017	2.75	1.00-1.25
3/30/2017	3.03	0.75-1.00	6/28/2017	2.77	1.00-1.25
3/31/2017	3.02	0.75-1.00	6/29/2017	2.82	1.00-1.25
			6/30/2017	2.84	1.00-1.25
2017Q1 Mean	3.05		2017Q2 Mean	2.90	

Date	30-year Treasury rate	Federal Funds rate	Date	30-year Treasury rate	Federal Funds rate
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7/5/2017	2.85	1.00-1.25	10/3/2017	2.87	1.00-1.25
7/6/2017	2.90	1.00-1.25	10/4/2017	2.87	1.00-1.25
7/7/2017	2.93	1.00-1.25	10/5/2017	2.89	1.00-1.25
7/10/2017	2.93	1.00-1.25	10/6/2017	2.91	1.00-1.25
7/11/2017	2.92	1.00-1.25	10/10/2017	2.88	1.00-1.25
7/12/2017	2.89	1.00-1.25	10/11/2017	2.88	1.00-1.25
7/13/2017	2.92	1.00-1.25	10/12/2017	2.86	1.00-1.25
7/14/2017	2.91	1.00-1.25	10/13/2017	2.81	1.00-1.25
7/17/2017	2.89	1.00-1.25	10/16/2017	2.82	1.00-1.25
7/18/2017	2.85	1.00-1.25	10/17/2017	2.80	1.00-1.25
7/19/2017	2.85	1.00-1.25	10/18/2017	2.85	1.00-1.25
7/20/2017	2.83	1.00-1.25	10/19/2017	2.83	1.00-1.25
7/21/2017	2.81	1.00-1.25	10/20/2017	2.89	1.00-1.25
7/24/2017	2.83	1.00-1.25	10/23/2017	2.89	1.00-1.25
7/25/2017	2.91	FOMC Hold 1.00-1.25	10/24/2017	2.92	1.00-1.25
7/26/2017	2.89	FOMC Hold 1.00-1.25	10/25/2017	2.95	1.00-1.25
7/27/2017	2.93	1.00-1.25	10/26/2017	2.96	1.00-1.25
7/28/2017	2.89	1.00-1.25	10/27/2017	2.93	1.00-1.25
7/31/2017	2.89	1.00-1.25	10/30/2017	2.88	1.00-1.25
8/1/2017	2.86	1.00-1.25	10/31/2017	2.88	FOMC Hold 1.00-1.25
8/2/2017	2.85	1.00-1.25	11/1/2017	2.85	FOMC Hold 1.00-1.25
8/3/2017	2.81	1.00-1.25	11/2/2017	2.83	1.00-1.25
8/4/2017	2.84	1.00-1.25	11/3/2017	2.82	1.00-1.25
8/7/2017	2.84	1.00-1.25	11/6/2017	2.80	1.00-1.25
8/8/2017	2.86	1.00-1.25	11/7/2017	2.77	1.00-1.25
8/9/2017	2.82	1.00-1.25	11/8/2017	2.79	1.00-1.25
8/10/2017	2.79	1.00-1.25	11/9/2017	2.81	1.00-1.25

**ROE and ROR Analysis for Montana-Dakota Utilities
ROR for Comparison Group**

**Docket No. PU-17-295
Exhibit MFG-21**

	Constant-Growth DCF ROE Analysis			Other ROE Analyses Results					
	DCF Ratio	DCF Cost	WACC	Multistage DCF Cost	WACC	CAPM Cost	WACC	ECAP M Cost	WACC
Long-Term Debt	43.04%	5.28%	2.27%	5.28%	2.27%	5.28%	2.27%	5.28%	2.27%
Short-Term Debt	5.97%	2.83%	0.17%	2.83%	0.17%	2.83%	0.17%	2.83%	0.17%
Common Equity	51.00%	9.23%	4.71%	8.50%	4.33%	9.25%	4.72%	9.87%	5.03%
	100%								
Overall Rate of Return			7.15%		6.77%		7.16%		7.48%

The recommended common equity cost of 9.23 percent is taken from ROE analysis in Exhibit MFG-xx, Schedule 1. The Multistage DCF common equity cost is taken from ROE analysis performed in Exhibit MFG-xx, Schedule 3. The CAPM and ECAPM costs of common equity are taken from ROE analysis performed in Exhibit MFG-xx, Schedule 4.

The long-term debt cost, short-term debt cost, and capital structure ratios are those proposed by Montana-Dakota Utilities Co. in Statement D, page 1. They are accepted. The ratios shown differ slightly from those proposed by Montana-Dakota. The values in the cells are carried out to three decimal places as Montana-Dakota presents them, but are rounded to two places.

**ROE and ROR Analysis for Montana-Dakota Utilities
Comparison Group
Common Equity Share Prices March 19, 2018-April 13, 2018
From Yahoo Finance, April 16, 2018**

**Docket No. PU-17-295
Exhibit MFG-22, page 1 of 2**

Atmos Energy (ATO)		New Jersey Resources (NJR)		NiSource (NI)		Northwest Natural Gas (NWN)	
Date	Close	Date	Close	Date	Close	Date	Close
3/19/2018	\$ 81.70	3/19/2018	\$ 39.85	3/19/2018	\$ 23.24	3/19/2018	\$ 57.00
3/20/2018	\$ 81.27	3/20/2018	\$ 39.05	3/20/2018	\$ 23.18	3/20/2018	\$ 56.20
3/21/2018	\$ 81.38	3/21/2018	\$ 39.20	3/21/2018	\$ 23.29	3/21/2018	\$ 56.25
3/22/2018	\$ 81.17	3/22/2018	\$ 39.10	3/22/2018	\$ 23.39	3/22/2018	\$ 56.45
3/23/2018	\$ 80.03	3/23/2018	\$ 38.15	3/23/2018	\$ 23.06	3/23/2018	\$ 55.40
3/26/2018	\$ 81.69	3/26/2018	\$ 38.80	3/26/2018	\$ 23.39	3/26/2018	\$ 56.25
3/27/2018	\$ 83.13	3/27/2018	\$ 39.25	3/27/2018	\$ 23.79	3/27/2018	\$ 56.90
3/28/2018	\$ 83.70	3/28/2018	\$ 39.80	3/28/2018	\$ 23.72	3/28/2018	\$ 57.70
3/29/2018	\$ 84.24	3/29/2018	\$ 40.10	3/29/2018	\$ 23.91	3/29/2018	\$ 57.65
4/2/2018	\$ 82.85	4/2/2018	\$ 39.45	4/2/2018	\$ 23.85	4/2/2018	\$ 57.30
4/3/2018	\$ 83.99	4/3/2018	\$ 40.10	4/3/2018	\$ 24.02	4/3/2018	\$ 57.70
4/4/2018	\$ 83.70	4/4/2018	\$ 40.25	4/4/2018	\$ 24.19	4/4/2018	\$ 58.00
4/5/2018	\$ 84.53	4/5/2018	\$ 40.85	4/5/2018	\$ 24.43	4/5/2018	\$ 58.90
4/6/2018	\$ 84.15	4/6/2018	\$ 40.60	4/6/2018	\$ 24.25	4/6/2018	\$ 59.00
4/9/2018	\$ 84.18	4/9/2018	\$ 40.50	4/9/2018	\$ 24.15	4/9/2018	\$ 58.80
4/10/2018	\$ 84.06	4/10/2018	\$ 40.20	4/10/2018	\$ 24.11	4/10/2018	\$ 58.60
4/11/2018	\$ 83.84	4/11/2018	\$ 40.55	4/11/2018	\$ 23.98	4/11/2018	\$ 58.95
4/12/2018	\$ 82.68	4/12/2018	\$ 39.85	4/12/2018	\$ 23.52	4/12/2018	\$ 58.05
4/13/2018	\$ 83.38	4/13/2018	\$ 40.20	4/13/2018	\$ 23.55	4/13/2018	\$ 58.30
	\$ 82.93		\$ 39.78		\$ 23.74		\$ 57.55

**ROE and ROR Analysis for Montana-Dakota Utilities
Comparison Group
Common Equity Share Prices
Yahoo Finance, December 4, 2017**

**Docket No. Docket No. PU-17-295
Exhibit MFG-22, page 2 of 2**

ONE Gas, Inc. (OGS)			Southwest Gas (SWX)			Spire, Inc. (SR)		
Date	Close		Date	Close		Date	Close	
3/19/2018	\$ 65.57		3/19/2018	\$ 69.48		3/19/2018	\$ 69.85	
3/20/2018	\$ 64.98		3/20/2018	\$ 68.57		3/20/2018	\$ 69.35	
3/21/2018	\$ 65.06		3/21/2018	\$ 68.52		3/21/2018	\$ 69.40	
3/22/2018	\$ 65.29		3/22/2018	\$ 67.21		3/22/2018	\$ 69.85	
3/23/2018	\$ 63.55		3/23/2018	\$ 66.20		3/23/2018	\$ 68.35	
3/26/2018	\$ 64.88		3/26/2018	\$ 66.68		3/26/2018	\$ 69.65	
3/27/2018	\$ 65.63		3/27/2018	\$ 67.19		3/27/2018	\$ 70.30	
3/28/2018	\$ 65.81		3/28/2018	\$ 67.62		3/28/2018	\$ 71.70	
3/29/2018	\$ 66.02		3/29/2018	\$ 67.63		3/29/2018	\$ 72.30	
4/2/2018	\$ 65.55		4/2/2018	\$ 67.65		4/2/2018	\$ 71.85	
4/3/2018	\$ 66.42		4/3/2018	\$ 67.56		4/3/2018	\$ 72.50	
4/4/2018	\$ 66.52		4/4/2018	\$ 67.29		4/4/2018	\$ 72.85	
4/5/2018	\$ 67.60		4/5/2018	\$ 68.67		4/5/2018	\$ 73.70	
4/6/2018	\$ 67.77		4/6/2018	\$ 69.07		4/6/2018	\$ 73.65	
4/9/2018	\$ 67.32		4/9/2018	\$ 69.42		4/9/2018	\$ 72.85	
4/10/2018	\$ 67.02		4/10/2018	\$ 69.51		4/10/2018	\$ 72.00	
4/11/2018	\$ 67.05		4/11/2018	\$ 69.29		4/11/2018	\$ 71.85	
4/12/2018	\$ 66.16		4/12/2018	\$ 68.61		4/12/2018	\$ 70.25	
4/13/2018	\$ 66.77		4/13/2018	\$ 68.96		4/13/2018	\$ 70.60	
	\$ 66.05			\$ 68.16			\$ 71.20	

**ROE and ROR Analysis for Montana-Dakota Utilities
Comparison Group
Dividends**

**Docket No. PU-17-295
Exhibit MFG-23**

Name	Value Line	Zacks	Highest Dividend
Atmos Energy	\$ 1.94 \$	1.94	\$ 1.94
New Jersey Resources	\$ 1.09 \$	1.09	\$ 1.09
NiSource, Inc.	\$ 0.78 \$	0.78	\$ 0.78
Northwestern Natural Gas	\$ 1.89 \$	1.89	\$ 1.89
ONE Gas, Inc.	\$ 1.84 \$	1.84	\$ 1.84
Southwest Gas	\$ 1.98 \$	1.98	\$ 1.98
Spire, Inc.	\$ 2.25 \$	2.25	\$ 2.25

Value Line dividends taken from March 2, 2018 research reports.

Zacks dividends taken from website on April 16, 2018

ROE and ROR Analysis for Montana-Dakota Utilities
Comparison Group
Discounted Cash Flow Constant-Growth Model Analysis
Common Equity Share Prices--March 19, 2018--April 13, 2018
Zacks, Yahoo! Finance, and Value Line EPS Growth-Rate
Estimates--March--April 2018

	A	B	C	D	E	F
	Zacks Growth Rate (%)	Yahoo! Finance Growth Rates (%)	Value Line EPS Growth Rates (%)	Zacks-Yahoo! Finance-Value Line Mean Growth Rate (%)	Average of Closing Prices	Annualized Dividend
Atmos Energy	7.00%	7.15%	7.50%	7.22%	\$ 82.93	\$ 1.94
New Jersey Resources	6.00%	6.00%	9.50%	7.17%	\$ 39.78	\$ 1.09
NiSource, Inc.*	5.40%	5.57%	-	5.49%	\$ 23.74	\$ 0.78
Northwest Natural Gas	4.00%	4.00%	7.00%	5.00%	\$ 57.55	\$ 1.89
ONE Gas, Inc.	5.60%	5.50%	8.00%	6.37%	\$ 66.05	\$ 1.84
Southwest Gas	NA	4.00%	7.50%	5.75%	\$ 68.16	\$ 1.98
Spire, Inc.	4.03%	4.10%	9.00%	5.71%	\$ 71.20	\$ 2.25
Mean	5.34%	5.19%	8.08%	6.10%		

*-Value Line EPS growth rate of 18.00 percent excluded from analysis.

	G	H	I	J
	Dividend Yield (Rate/Price)	Expected Dividend Yield	Flotation-Adjusted Expected Dividend Yield	Required Rate of Return on Equity
Atmos Energy	2.34%	2.42%	2.51%	9.73%
New Jersey Resources	2.74%	2.84%	2.95%	10.12%
NiSource, Inc.*	3.29%	3.38%	3.50%	8.99%
Northwest Natural Gas	3.28%	3.37%	3.49%	8.49%
ONE Gas, Inc.	2.79%	2.87%	2.98%	9.35%
Southwest Gas	2.90%	2.99%	3.10%	8.85%
Spire, Inc.	3.16%	3.25%	3.37%	9.08%
Mean	2.93%	3.02%	3.13%	9.23%

A: Zacks website, April 16, 2018. MFG-Workpaper 5.
B: Yahoo! Finance website; April 16, 2018. MFG-Workpaper 6.
C: Value Line Investment Survey: March 2, 2018. MFG-Workpaper 7.
E: Yahoo! Finance website; March 19, 2018-April 13, 2018 (19 trading days).
F: Higher of Value Line Investment Survey: March 2, 2018 and Zacks report, April 16, 2018. See Exhibit MFG-623

D: (A + B + C)/3
G: E/E
H: G*(1+(0.5*D))
I: H/(1.00 - 0.036)
Flotation adjustment
See Exhibit MFG-7
J: D + I

Congressional Budget Office, *Budget and Economic Outlook: 2018 to 2028* (April), available at www.cbo.gov/publication/52801.

10-Year Economic Projections

April 2018 Baseline Forecast—Data Release (Calendar Year)

Output	Units	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Average annual change
Gross Domestic Product (GDP)	Billions of dollars	18625	19387	20362	21369	22247	23079	23937	24857	25832	26849	27867	28957	30087	3.9
	Percentage change, annual rate	2.8	4.1	5.0	4.9	4.1	3.7	3.7	3.8	3.9	3.9	3.8	3.9	3.9	3.9
	Billions of dollars	18622	19603	20544	21506	22340	23160	24028	24968	25969	26991	28006	29088	30210	3.9
Gross National Product (GNP)	Percentage change, annual rate	2.7	4.2	4.8	4.7	3.9	3.7	3.7	3.9	4.0	3.9	3.8	3.9	3.9	3.9
	Billions of dollars	18875	19531	20278	21118	22022	22966	23933	24934	25958	26990	28037	29114	30238	3.9
	Percentage change, annual rate	3.0	3.5	3.8	4.1	4.3	4.3	4.2	4.2	4.1	4.0	3.9	3.8	3.9	3.9
Real GDP	Billions of 2009 dollars	16716	17093	17613	18118	18472	18754	19040	19347	19679	20028	20361	20728	21101	1.8
	Percentage change, annual rate	1.5	2.3	3.0	2.9	2.0	1.5	1.5	1.6	1.7	1.8	1.7	1.8	1.8	1.8
	Billions of 2009 dollars	16879	17271	17757	18218	18531	18800	19090	19410	19756	20106	20432	20789	21152	1.7
Real Potential GDP	Percentage change, annual rate	1.4	2.3	2.8	2.6	1.7	1.5	1.5	1.7	1.8	1.8	1.6	1.7	1.7	1.7
	Billions of 2009 dollars	16940	17219	17541	17905	18285	18663	19037	19407	19774	20133	20485	20841	21207	1.8
	Percentage change, annual rate	1.7	1.6	1.9	2.1	2.1	2.1	2.0	1.9	1.9	1.8	1.7	1.7	1.7	1.8
Price Index, Personal Consumption Expenditures (PCE)	2009=100	110.8	112.7	114.7	116.9	119.4	121.9	124.5	127.2	129.8	132.4	135.1	137.8	140.5	2.0
	Percentage change, annual rate	1.2	1.7	1.8	1.9	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0
	2009=100	111.4	113.1	115.1	117.4	120.0	122.6	125.2	127.8	130.5	133.1	135.7	138.3	141.1	2.0
Price Index, PCE, Excluding food and energy	Percentage change, annual rate	1.8	1.5	1.8	2.0	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0
	1982-84=100	240.0	245.1	250.4	256.0	262.3	268.9	275.6	282.3	289.1	296.0	303.0	310.1	317.5	2.4
	Percentage change, annual rate	1.3	2.1	2.2	2.2	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4
CPI-U, Excluding Food and Energy	1982-84=100	247.6	252.2	257.5	263.7	270.6	277.7	284.7	291.6	298.5	305.6	312.7	320.1	327.6	2.4
	Percentage change, annual rate	2.2	1.8	2.1	2.4	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.4
	Dec 1999=100	136.6	139.2	142.0	144.8	148.0	151.3	154.7	158.1	161.5	164.9	168.4	171.9	175.5	2.1
Chained CPI-U	Percentage change, annual rate	0.9	1.9	2.0	2.0	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1
	2009=100	111.4	113.4	115.6	117.9	120.4	123.1	125.7	128.5	131.3	134.1	136.9	139.7	142.6	2.1
	Percentage change, annual rate	1.3	1.8	1.9	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1

The long-term growth rate is the Gross Domestic Product 3.9 percent average growth rate per year from 2024-2028.
The Real GDP average annual increase plus the GDP Price Index average annual increase equal the GDP average growth rate per year.

Table A20. Macroeconomic indicators
(billion 2009 chain-weighted dollars, unless otherwise noted)

Indicators	Reference case							Annual growth 2017-2050 (percent)
	2016	2017	2025	2030	2035	2040	2050	
Real gross domestic product	16,716	17,075	20,221	22,421	24,802	27,356	33,205	2.0%
Components of real gross domestic product								
Real consumption	11,572	11,877	14,364	16,126	17,940	19,871	24,338	2.2%
Real investment	2,210	2,306	2,981	3,425	3,913	4,487	5,905	2.9%
Real government spending	2,900	2,905	3,016	3,176	3,370	3,573	4,004	1.0%
Real exports	2,120	2,200	2,920	3,532	4,224	5,019	6,819	3.5%
Real imports	2,706	2,810	3,830	4,656	5,550	6,552	8,990	3.6%
Energy intensity (thousand Btu per 2009 dollar of GDP)								
Delivered energy	4.28	4.22	3.71	3.35	3.06	2.84	2.47	-1.6%
Total energy	5.80	5.67	4.95	4.49	4.10	3.80	3.28	-1.6%
Price indices								
GDP chain-type price index (2009=1.00)	1.11	1.13	1.37	1.53	1.71	1.91	2.44	2.3%
Consumer price index (1982-4=1.00)								
All-urban	2.40	2.45	3.02	3.43	3.89	4.43	5.79	2.6%
Energy commodities and services	1.90	1.99	2.90	3.32	3.79	4.35	5.64	3.2%
Wholesale price index (1982=1.00)								
All commodities	1.85	1.93	2.33	2.54	2.74	2.97	3.50	1.8%
Fuel and power	1.46	1.59	2.33	2.67	3.04	3.50	4.61	3.3%
Metals and metal products	1.94	2.07	2.30	2.38	2.43	2.47	2.53	0.6%
Industrial commodities excluding energy	1.93	1.99	2.28	2.46	2.61	2.78	3.14	1.4%
Interest rates (percent, nominal)								
Federal funds rate	0.40	1.03	3.00	3.00	3.00	3.00	3.00	--
10-year treasury note	1.84	2.40	4.03	4.01	4.03	4.07	4.07	--
AA utility bond rate	3.73	3.92	6.07	5.97	5.95	5.97	5.91	--
Value of shipments (billion 2009 dollars)								
Non-industrial and service sectors	21,674	22,698	27,021	30,402	34,118	38,086	46,102	2.2%
Total industrial	7,335	7,575	8,777	9,540	10,320	11,171	12,908	1.6%
Agriculture, mining, and construction	2,046	2,031	2,450	2,603	2,744	2,905	3,265	1.4%
Manufacturing	5,289	5,544	6,327	6,936	7,576	8,266	9,643	1.7%
Energy-intensive	1,903	1,971	2,244	2,377	2,506	2,654	2,939	1.2%
Non-energy-intensive	3,386	3,573	4,082	4,560	5,070	5,612	6,704	1.9%
Total shipments	29,008	30,272	35,798	39,942	44,439	49,257	59,010	2.0%
Population and employment (millions)								
Population, with armed forces overseas	324	326	347	359	370	379	398	0.6%
Population, aged 16 and over	258	261	280	291	301	310	327	0.7%
Population, aged 65 and over	49	51	66	74	79	82	88	1.7%
Employment, nonfarm	144	146	156	161	166	172	182	0.7%
Employment, manufacturing	12.0	12.5	14.1	14.6	14.7	14.8	14.8	0.5%
Key labor indicators								
Labor force (millions)	159	160	170	176	181	187	198	0.6%
Nonfarm labor productivity (2009=1.00)	1.07	1.08	1.22	1.32	1.43	1.55	1.81	1.6%
Unemployment rate (percent)	4.85	4.40	4.58	4.70	4.66	4.73	4.68	--
Key indicators for energy demand								
Real disposable personal income	12,609	12,826	15,706	17,698	19,747	21,822	26,328	2.2%
Housing starts (millions)	1.26	1.31	1.61	1.62	1.67	1.65	1.75	0.9%
Commercial floorspace (billion square feet)	90	91	99	104	110	115	126	1.0%
Unit sales of light-duty vehicles (millions)	17.5	17.1	16.9	17.4	17.5	18.0	19.5	0.4%

GDP = Gross domestic product.

Btu = British thermal unit.

-- = Not applicable.

Sources: 2016 and 2017: IHS Markit, Macroeconomic and Employment models, August 2017; and IHS Markit, Industry model, May 2017. **Projections:** U.S. Energy Information Administration, AEO2018 National Energy Modeling System run ref2018.d121317a.

ROE and ROR Analysis for Montana-Dakota Utilities
Comparison Group
Discounted Cash Flow Multistage Model Analysis
Common Equity Share Prices--March 19, 2018-April 13, 2018
Zacks, Yahoo! Finance, and Value Line EPS Growth-Rate
Estimates--March-April 2018

Docket No. PU-17-295
Exhibit MFG-24, Schedule 4

	A	B	C	D	E	F
	Zacks EPS Growth Rate (%)	Yahoo! Finance EPS Rates (%)	Value Line EPS Growth Rates (%)	Zacks-Yahoo! Finance-Value Line Mean Growth Rate (%)	Average of Closing Prices	Annualized Dividend
Company Name						
Atmos Energy	7.00%	7.15%	7.50%	7.22%	\$ 82.93	\$ 1.94
New Jersey Resources	6.00%	6.00%	9.50%	7.17%	\$ 39.78	\$ 1.09
NiSource, Inc.	5.40%	5.57%	-	5.49%	\$ 23.74	\$ 0.78
Northwest Natural Gas	4.00%	4.00%	7.00%	5.00%	\$ 57.55	\$ 1.89
ONE Gas, Inc.	5.60%	5.50%	8.00%	6.37%	\$ 66.05	\$ 1.84
Southwest Gas	NA	4.00%	7.50%	5.75%	\$ 68.16	\$ 1.98
Spire, Inc.	4.03%	4.10%	9.00%	5.71%	\$ 71.20	\$ 2.25
Mean	5.34%	5.19%	8.08%	6.10%		

	G	H	I	J	K	L	M
	Dividend Yield (Rate/Price)	Expected Dividend Yield	Flotation Adjusted Expected Dividend Yield	CBO Long- Run Projected Growth Rate, 3.9%	EIA Long- Run Projected Growth Rate, 4.3%	Weighted Projected Growth Rate 4.1%	Multistage Weighted Cost of Equity 4.1%
Company Name							
Atmos Energy	2.34%	2.42%	2.51%	3.90%	4.30%	6.18%	8.69%
New Jersey Resources	2.74%	2.84%	2.95%	3.90%	4.30%	6.14%	9.09%
NiSource, Inc.	3.29%	3.38%	3.50%	3.90%	4.30%	5.02%	8.53%
Northwest Natural Gas	3.28%	3.37%	3.49%	3.90%	4.30%	4.70%	8.19%
ONE Gas, Inc.	2.79%	2.87%	2.98%	3.90%	4.30%	5.61%	8.59%
Southwest Gas	2.90%	2.99%	3.10%	3.90%	4.30%	5.20%	8.30%
Spire, Inc.	3.16%	3.25%	3.37%	3.90%	4.30%	5.17%	8.54%
Mean	2.93%	3.02%	3.13%	3.90%	4.30%	5.37%	8.50%

A: Zacks website, April 16, 2018. MFG-Workpaper 5.

B: Yahoo! Finance website; April 16, 2018. MFG-Workpaper 6.

C: Value Line Investment Survey: March 2, 2018. MFG-Workpaper 7.

E: Yahoo! Finance website; March 19, 2018-April 13, 2018 (19 trading days).

F: Higher of Value Line Investment Survey: March 2, 2018 and Zacks report, April 16, 2018. See Exhibit MFG-23.

J: Congressional Budget Office, *Budget and Economic Outlook: 2018 to 2028*, April 9, 2018, www.cbo.gov/publication/52801

K: U.S. Energy Information Administration, *Annual Energy Outlook 2018*, Table A20

$$D = (A + B + C)/3$$

$$G = F/E$$

$$H = G*(1+(0.5*J))$$

$$I = H/(1.00 - 0.036)$$

$$L: \text{Long-term growth: } (J +$$

Flotation adjustment

$$K)/2 = 4.1\%$$

$$L = ((2/3 * D) + (1/3 * (4.1)))$$

$$M = I + L$$

See Exhibit MFG-7

ROE and ROR Analysis for Montana-Dakota Utilities

Docket No. PU-17-295
Exhibit MFG-24, Schedule 5

Comparison Group

Discounted Cash Flow Constant-Growth Model Analysis with Gaske Flotation Adjustment

Common Equity Share Prices--March 19, 2018-April 13, 2018

Zacks, Yahoo! Finance, and Value Line EPS Growth-Rate

Estimates--March-April 2018

Company Name	A		B		C		D		E		F
	Zacks Growth Rate (%)	EPS Growth Rates (%)	Yahoo! Finance Growth Rates (%)	Value Line EPS Growth Rates (%)	Zacks-Yahoo! Finance-Value Line Mean Growth Rate (%)	Average of Closing Prices	Annualized Dividend				
Atmos Energy	7.00%	7.15%	7.15%	7.50%	7.22%	\$ 82.93	\$ 1.94				
New Jersey Resources	6.00%	6.00%	6.00%	9.50%	7.17%	\$ 39.78	\$ 1.09				
NiSource, Inc.	5.40%	5.57%	5.57%	-	5.49%	\$ 23.74	\$ 0.78				
Northwest Natural Gas	4.00%	4.00%	4.00%	7.00%	5.00%	\$ 57.55	\$ 1.89				
ONE Gas, Inc.	5.60%	5.50%	5.50%	8.00%	6.37%	\$ 66.05	\$ 1.84				
Southwest Gas	NA	4.00%	4.00%	7.50%	5.75%	\$ 68.16	\$ 1.98				
Spire, Inc.	4.03%	4.10%	4.10%	9.00%	5.71%	\$ 71.20	\$ 2.25				
Mean	5.34%	5.19%	5.19%	8.08%	6.10%						

Company Name	G		H		I		J		K	
	Dividend Yield (Rate/Price)	Expected Dividend Yield	Expected Dividend Yield	Adjusted Expected Dividend Yield	Flotation Rate of Return on Equity	Required Rate of Return on Equity w/ Gaske Flotation	Required Rate of Return on Equity w/ Gaske Flotation	Required Rate of Return on Equity w/ Gaske Flotation	Required Rate of Return on Equity w/ Gaske Flotation	Required Rate of Return on Equity w/ Gaske Flotation
Atmos Energy	2.34%	2.42%	2.42%	2.51%	9.73%	9.99%	9.99%	9.99%	9.99%	9.99%
New Jersey Resources	2.74%	2.84%	2.84%	2.95%	10.12%	10.37%	10.37%	10.37%	10.37%	10.37%
NiSource, Inc.	3.29%	3.38%	3.38%	3.50%	8.99%	9.18%	9.18%	9.18%	9.18%	9.18%
Northwest Natural Gas	3.28%	3.37%	3.37%	3.49%	8.49%	8.67%	8.67%	8.67%	8.67%	8.67%
ONE Gas, Inc.	2.79%	2.87%	2.87%	2.98%	9.35%	9.57%	9.57%	9.57%	9.57%	9.57%
Southwest Gas	2.90%	2.99%	2.99%	3.10%	8.85%	9.05%	9.05%	9.05%	9.05%	9.05%
Spire, Inc.	3.16%	3.25%	3.25%	3.37%	9.08%	9.28%	9.28%	9.28%	9.28%	9.28%
Mean	2.93%	3.02%	3.02%	3.13%	9.23%	9.44%	9.44%	9.44%	9.44%	9.44%

A: Zacks website, November 26, 2017. MFG-Workpaper 5.

B: Yahoo! Finance website; November 28, 2017. MFG-Workpaper 6.

C: Value Line Investment Survey: December 1, 2017. MFG-Workpaper 7.

E: Yahoo! Finance website; November 6, 2017-December 1, 2017 (19 trading days).

F: Higher of Value Line Investment Survey: December 1, 2017 and Zacks report, November 26, 2017. See Exhibit MFG-6.

D: (A + B + C)/3

G: F/E

H: $G*(1+(0.5*D))$

I: $H/(1.00 - 0.0360)$

J: D + I

K: (D + H)*1.036

Flotation adjustment

See Exhibit MFG-7

Daily Treasury Yield Curve Rates (Percent)

March 19, 2018-April 13, 2018

Date	1 mo	3 mo	6 mo	1 yr	2 yr	3 yr	5 yr	7 yr	10 yr	20 yr	30 yr
3/19/2018	1.70	1.80	1.99	2.08	2.31	2.45	2.65	2.78	2.85	2.97	3.09
3/20/2018	1.76	1.81	1.97	2.08	2.34	2.49	2.69	2.82	2.89	3.01	3.12
3/21/2018	1.71	1.74	1.95	2.06	2.31	2.46	2.69	2.82	2.89	3.01	3.12
3/22/2018	1.67	1.72	1.95	2.05	2.29	2.43	2.63	2.76	2.83	2.94	3.06
3/23/2018	1.69	1.74	1.92	2.04	2.28	2.41	2.61	2.74	2.82	2.94	3.06
3/26/2018	1.71	1.79	1.94	2.06	2.33	2.44	2.64	2.78	2.85	2.96	3.08
3/27/2018	1.69	1.77	1.93	2.10	2.26	2.39	2.58	2.70	2.78	2.90	3.03
3/28/2018	1.65	1.73	1.95	2.12	2.28	2.41	2.59	2.72	2.77	2.89	3.01
3/29/2018	1.63	1.73	1.93	2.09	2.27	2.39	2.56	2.68	2.74	2.85	2.97
4/2/2018	1.68	1.77	1.92	2.08	2.25	2.37	2.55	2.67	2.73	2.85	2.97
4/3/2018	1.70	1.75	1.92	2.09	2.28	2.41	2.60	2.73	2.79	2.90	3.02
4/4/2018	1.67	1.71	1.90	2.07	2.28	2.42	2.61	2.73	2.79	2.91	3.03
4/5/2018	1.67	1.72	1.93	2.07	2.30	2.45	2.64	2.76	2.83	2.95	3.07
4/6/2018	1.68	1.73	1.91	2.06	2.27	2.40	2.58	2.70	2.77	2.89	3.01
4/9/2018	1.67	1.76	1.93	2.08	2.29	2.43	2.60	2.72	2.78	2.89	3.02
4/10/2018	1.63	1.74	1.93	2.09	2.32	2.45	2.62	2.74	2.80	2.89	3.02
4/11/2018	1.64	1.73	1.95	2.09	2.32	2.45	2.62	2.72	2.79	2.87	2.99
4/12/2018	1.65	1.75	1.95	2.11	2.34	2.49	2.67	2.78	2.83	2.92	3.05
4/13/2018	1.64	1.76	1.97	2.12	2.37	2.51	2.67	2.77	2.82	2.91	3.03

Mean 3.04

**ROE and ROR Analysis for Montana-Dakota Utilities
Capital Asset Pricing Model (CAPM) Analysis
Beta calculation for Comparison Group**

**Docket No. PU-17-295
Exhibit MFG-25, Schedule 2**

Company Name	Value Line Betas-- Comparison Group
Atmos Energy	0.70
New Jersey Resources	0.80
NiSource, Inc.	0.60
Northwest Natural Gas	0.70
ONE Gas, Inc.	0.70
Southwest Gas	0.80
Spire, Inc.	0.70
Mean	0.71

Value Line betas taken from March 2, 2018 Investment Survey reports.



THE VALUE LINE
 Investment Survey®

Part 1
Summary & Index

File at the front of the Ratings & Reports binder. Last week's Summary & Index should be removed.

April 13, 2018

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The Median of Estimated **PRICE-EARNINGS RATIOS** of all stocks with earnings

18.5

26 Weeks Ago	Market Low	Market High
20.0	3-9-09 10.3	1-26-18 21.1

The Median of Estimated **DIVIDEND YIELDS** (next 12 months) of all dividend paying stocks under review

2.0%

26 Weeks Ago	Market Low	Market High
2.0%	3-9-09 4.0%	1-26-18 1.8%

The Estimated Median Price **APPRECIATION POTENTIAL** of all 1700 stocks in the Value Line universe in the hypothesized economic environment 3 to 5 years hence

45%

26 Weeks Ago	Market Low	Market High
30%	3-9-09 185%	1-26-18 20%

ANALYSES OF INDUSTRIES IN ALPHABETICAL ORDER WITH PAGE NUMBER

Numeral in parenthesis after the industry is rank for probable performance (next 12 months).

	PAGE		PAGE		PAGE		PAGE
Advertising (32)	2392	Electric Utility (West) (78)	2223	Investment Co.(Foreign) (-)	419	Railroad (68)	339
Aerospace/Defense (64)	701	Electronics (46)	1317	*Machinery (17)	1701	R.E.I.T. (90)	1510
Air Transport (43)	301	Engineering & Const (86)	1231	Maritime (96)	330	Recreation (31)	2301
Apparel (73)	2101	Entertainment (51)	2327	Medical Services (36)	795	Reinsurance (97)	2023
Automotive (26)	101	Entertainment Tech (89)	2009	Med Supp Invasive (34)	168	Restaurant (45)	351
Auto Parts (5)	973	Environmental (59)	409	Med Supp Non-Invasive (25)	194	Retail Automotive (9)	2118
Bank (21)	2501	Financial Svcs. (Div.) (18)	2534	Metal Fabricating (79)	730	Retail Building Supply (58)	1137
Bank (Midwest) (23)	777	Food Processing (72)	1901	Metals & Mining (Div.) (80)	1579	Retail (Hardlines) (63)	2164
Beverage (41)	1966	Foreign Electronics (15)	1985	Natural Gas Utility (8)	547	Retail (Softlines) (39)	2199
Biotechnology (84)	830	*Funeral Services (22)	1837	Natural Gas (Div.) (49)	525	Retail Store (19)	2134
*Brokers & Exchanges (40)	1793	Furn/Home Furnishings (47)	1147	Newspaper (70)	2385	Retail/Wholesale Food (48)	1946
Building Materials (4)	1101	Healthcare Information (60)	822	Office Equip/Supplies (74)	1410	Semiconductor (7)	1347
Cable TV (75)	1019	Heavy Truck & Equip (30)	150	Oil/Gas Distribution (56)	609	Semiconductor Equip (1)	1380
Chemical (Basic) (65)	1595	Homebuilding (6)	1123	Oilfield Svcs/Equip. (94)	2422	Shoe (57)	2155
Chemical (Diversified) (2)	2446	Hotel/Gaming (35)	2351	Packaging & Container (33)	1173	Steel (11)	741
Chemical (Specialty) (14)	559	Household Products (88)	1188	Paper/Forest Products (16)	1163	Telecom. Equipment (87)	939
Computers/Peripherals (24)	1394	Human Resources (13)	1634	Petroleum (Integrated) (67)	501	Telecom. Services (55)	918
Computer Software (28)	2586	Industrial Services (42)	378	Petroleum (Producing) (44)	2402	Telecom. Utility (91)	1027
*Diversified Co. (54)	1738	Information Services (29)	433	Pharmacy Services (3)	965	Thrift (93)	1501
Drug (82)	1605	IT Services (12)	2609	Pipeline MLPs (81)	1247, 619	Tobacco (69)	1993
*E-Commerce (27)	1814	Insurance (Life) (76)	1551	Power (92)	1214	Toiletries/Cosmetics (71)	1008
Educational Services (61)	2000	Insurance (Prop/Cas.) (83)	756	Precious Metals (53)	1563	Trucking (38)	318
Electrical Equipment (52)	1301	Internet (77)	2633	Precision Instrument (37)	112	*Water Utility (50)	1783
Electric Util. (Central) (10)	901	*Investment Banking (20)	1806	Public/Private Equity (62)	2658	Wireless Networking (85)	593
Electric Utility (East) (66)	137	Investment Co. (-)	1203	Publishing (95)	2377		

*Reviewed in this week's issue.

In three parts: This is Part 1, the Summary & Index. Part 2 is Selection & Opinion. Part 3 is Ratings & Reports. Volume LXXIII, No. 35.
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**ROE and ROR Analysis for Montana-Dakota Utilities
Capital Asset Pricing Model (CAPM) Analysis
Calculation of ROE**

**Docket No. PU-17-295
Exhibit MFG-25, Schedule 4**

CAPM calculation

$$k = r + \beta (k_m - r)$$

Where: k = required rate of return for the specific stock
 β = beta, the systematic or stock-specific risk
 r = rate of return on a riskless asset
 k_m = required rate of return in the market portfolio

4-Year Annualized Growth Rate for Value Line Data
 Value Line April 13, 2018 forecast data* 2.00%
 Dividend yield 9.73%
 45 percent market appreciation potential, 3-5 years 11.73%
 4-year growth rate (1.45²⁵ - 1.00) 8.69%
 Value Line forecast result (2.0% + 9.73%)
 Market risk premium (11.73% - 3.04%)

*-Exhibit MFG-13, Schedule 3

$r = 3.04\%$ 30-Year Treasury Bill March 2, 2018-April 13, 2018 average, Exhibit MFG-13, Schedule 1
 $(k_m - r) = 8.69\%$ Market risk premium
 $\beta = 0.71$ Value Line mean beta for Comparison Group, Exhibit MFG-13, Schedule 2
 $\beta * (k_m - r) = 6.21\%$
 $k = 9.25\%$

CAPM ROE

Gaske $(k_m - r) = 9.50\%$ Market risk premium: S&P 500 Market Return - Risk-Free Rate (12.54% - 3.04%)
 Gaske CAPM ROE $k = 9.83\%$
 Gorman $(k_m - r) = 8.34\%$ Market risk premium
 Gorman CAPM ROE $k = 9.00\%$

Empirical CAPM (ECAPM) calculations**

$$k = r + x * (k_m - r) + (1 - x) * \beta * (k_m - r)$$

Where:

$$x = 0.25$$

$$k = 3.04\% + 0.25 * (11.73\% - 3.04\%) + (1 - 0.25) * 0.71 * (11.73\% - 3.04\%)$$

ECAPM ROE

$$k = 9.87\%$$

** - See Pages 190-191, Morin, Roger, *New Regulatory Finance* (2006), Public Utilities Reports, Inc., Vienna, Virginia, Exhibit MFG-14, Schedule 5

New Regulatory Finance

Flotation Costs and Retained Earnings

Another point of contention is whether or not the retained earnings component of equity requires a flotation cost adjustment. The conventional flotation cost adjustment formula deals with the fact that flotation costs are incurred only when new stock is sold, and not when earnings are retained. This is done by applying the flotation adjustment only to the dividend yield of the DCF formula and not to the growth component. The larger the fraction of earnings retained, the higher the growth rate, the lower the dividend yield component, and the smaller the flotation costs adjustment. In other words, larger retained earnings result in lower flotation cost adjustments as the costs are postponed into the future.

The numerical examples discussed previously in Tables 10-3 through 10-5 showed that not only is the flotation adjustment always required each and every year, whether or not new stock issues are sold in the future, but that the allowed return on equity must be earned on total equity, including retained earnings, for investors to earn the cost of equity.

Flotation Cost and Market-to-Book Ratios

The flotation cost adjustment does not depend on any market-to-book input assumption and is still relevant even when utility companies have stock prices in excess of book value, as they have for over two decades. This is because the flotation adjustment applicable to all the company's book equity is an average of the current allowances required for each past financing, that is, each source of equity. The flotation cost allowance is a buildup of historical flotation cost adjustments. Clearly, over such a long time period, equity issues were made, and will be made in the future, under varying market circumstances and capital market conditions. Some issues were consummated at market-to-book ratios in excess of one, others below one.

The derivation of the conventional flotation cost adjustment formula does not depend on the assumption of a market-to-book ratio equal to 1.00. This can be seen as follows. A company's existing shareholders expect a given stream of dividends to be produced from the firm's existing asset base. Following a stock issue, new shareholders likewise expect the same dividend stream. But the only way the new shareholders can receive the same dividend stream without impairing the dividend stream of old investors is that new funds from the stock issue be invested at a return sufficiently high to provide a dividend stream whose present value is equal to the net proceeds of the issue.

Company-Specific Flotation Cost Allowance

Some suggest that the flotation cost allowance should be based on a company's own actual flotation cost experience rather than on empirical studies that

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WHERE CAN INVESTORS SEEK PREDICTABLE INCOME?



THE FED

ECONOMY | WORLD ECONOMY | US ECONOMY | THE FED | CENTRAL BANKS | JOBS | GDP OUTLOOK

Fed could cut its balance sheet in half, Bernanke says



- The Fed is scheduled to conclude its two-day meeting this Wednesday, but is not expected to raise interest rates until at least June.
- "I think they're aiming for something in the vicinity of \$2.3 to \$2.8 trillion, something like that," former Fed Chair Ben Bernanke said Monday on CNBC's "Squawk Box."
- March meeting minutes showed the Fed intends to cut the size of the balance sheet this year.

Evelyn Cheng | @chengevelyn

Published 9:44 AM ET Mon, 1 May 2017 | Updated 10:14 AM ET Mon, 1 May 2017



Former Federal Reserve Chairman Ben Bernanke says the central bank could reduce its \$4.5 trillion balance sheet by as much as half.

"I think they're aiming for something in the vicinity of \$2.3 to \$2.8 trillion, something like that," he said Monday on CNBC's "Squawk Box."

Bernanke did not expect the Fed would return its balance sheet to precrisis levels of less than \$1 trillion.

During the financial crisis, the monetary-policy setting Federal Open Market Committee bought a massive amount of assets and cut short-term interest rates to near zero in an effort to stimulate the economy.



