MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.

BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION

CASE NO. PU-16-666

PREPARED REBUTTAL TESTIMONY OF

J. STEPHEN GASKE

Q1. Please state your name, position and business address.

A1. My name is J. Stephen Gaske and I am a Senior Vice President of Concentric Energy Advisors Inc., 1300 19th Street, NW, Suite 620, Washington, DC 20036.

Q2. Are you the same J. Stephen Gaske who filed Prepared Direct Testimony earlier in this proceeding?

A2. Yes. I am filing this rebuttal testimony on behalf of Montana-Dakota Utilities Co. ("Montana-Dakota" or the "Company"). Montana-Dakota is a wholly-owned division of MDU Resources Group, Inc. ("MDU Resources").

Q3. What is the purpose of your Rebuttal Testimony in this proceeding?

A3. I am responding to the Direct Testimony concerning return on common equity filed by Richard A Polich on behalf of the North Dakota Public Service Commission Advocacy Staff ("Staff"). Mr. Polich recommends an 8.53% allowed return on common equity for Montana-Dakota's North Dakota electric utility operations. However, as shown in my Prepared Direct Testimony, and as discussed herein, a return on common equity of 10.00 percent is required in order for Montana-Dakota to be in a position to raise capital on reasonable terms.

Q4. Please summarize Mr. Polich's testimony and recommendation relating to return on equity in this proceeding.

A4. Mr. Polich recommends an allowed rate of return on common equity of 8.53 percent for Montana-Dakota's North Dakota electric operations. Mr. Polich applies the two-step DCF methodology to a different proxy group compared to mine to come up with his recommended ROE.

Q5. Please summarize the reasons that you believe Mr. Polich's ROE recommendation in this proceeding is not reasonable.

A5. There are several areas in the testimony of Mr. Polich that I disagree with, which lead him to recommend an inadequate return, including:

1. Failure to satisfy a comparable earnings standard required to allow the company to compete for capital on reasonable terms;
2. Failure to recognize that Montana-Dakota's North Dakota electric utility operations face greater overall business and regulatory risks than the typical company in the proxy group;
3. Using U.S. GDP growth rates in his DCF analysis that do not properly reflect investors' expectations for the proxy companies;
4. Incorrect exclusion of flotation cost adjustment;
5. Incorrect assessment of the effect of current market conditions on DCF results; and,
6. Failure to consider risk premium and other analyses in addition to the DCF method.

I. REASONABLENESS OF ROE RECOMMENDATIONS

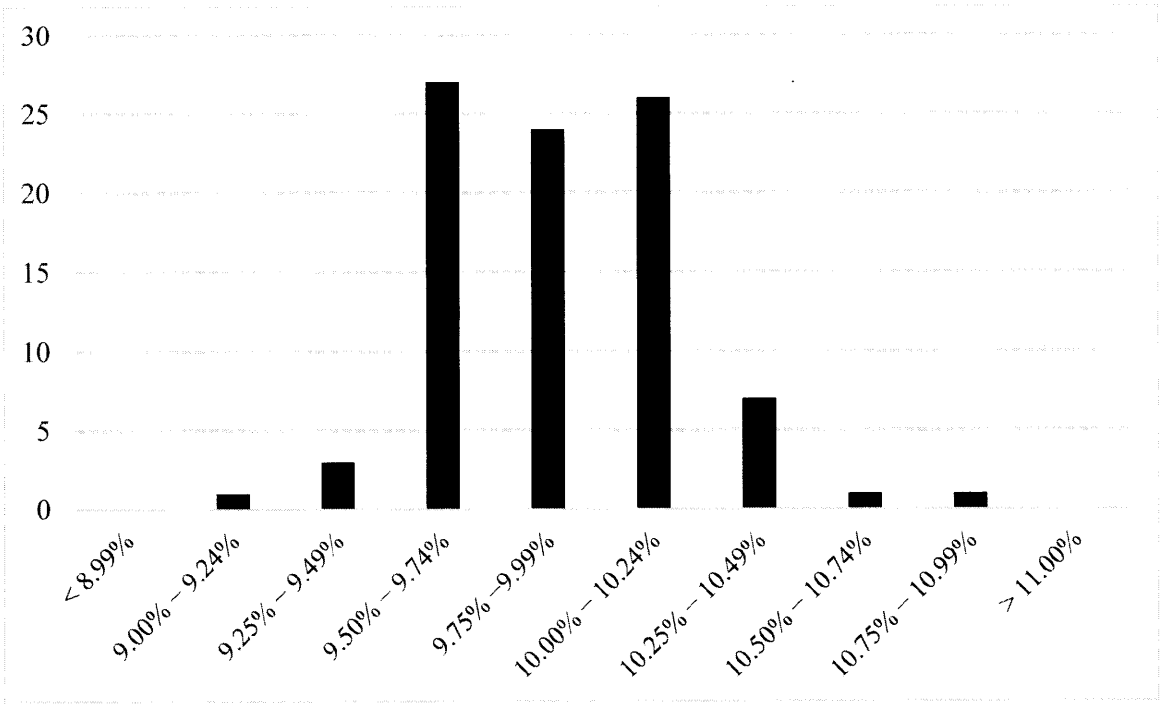
Q6. Please provide an overview of Mr. Polich's ROE recommendations in this proceeding.

A6. Mr. Polich recommends a range of return on equity for Montana-Dakota's North Dakota electric utility operations of 5.49 percent to 9.94 percent and a point estimate of 8.53 percent.

Q7. Please assess the reasonableness of Mr. Polich's 8.53 percent recommended return on common equity.

A7. Figure 1 below is a histogram of all returns on common equity authorized in electric utility rate proceedings, for all vertically-integrated electric utilities covered by Regulatory Research Associates from 2013 to present. The allowed rates of return on common equity for electric utility companies during this time period were in a range between 9.00 percent and 10.95 percent.

Figure 1: Authorized Returns on Equity for Electric Utilities (2013-Present)[1]



With respect to Mr. Polich's recommended ROE of 8.53 percent, of the 90 electric rate proceedings with explicit ROE awards since 2013 no case set the ROE below 9.0 percent. In fact, the average ROE allowed in these proceedings was 9.87 percent.

Similarly, as shown on Exhibit No. JSG-4, Schedule 1, Value Line projects that the average proxy company in Mr. Polich's group is expected to earn a 10.6 percent return on equity.

In other words, Mr. Polich's 8.53 percent recommendation is below the lowest return allowed by Commissions in recent years and my 10.00 percent recommended return is less than the average rate of return that Value Line expects his proxy

[1] Source: Regulatory Research Associates

companies to earn. It is evident that setting the authorized return on common equity for Montana-Dakota's North Dakota electric utility operations at 8.53 percent would violate the comparable investment standard set forth by the United States Supreme Court in *Federal Power Commission v. Hope Natural Gas Company* (1944). The return recommendation of Mr. Polich would not provide investors with an ROE that is "commensurate with returns on investments in other enterprises having corresponding risks."[2]

II. RELATIVE RISK OF MONTANA-DAKOTA'S NORTH DAKOTA OPERATIONS

Q8. Does Mr. Polich disagree with your assessment of relative risk of Montana-Dakota's North Dakota electric utility operations resulting from its heavy reliance on coal-fired generation.

A8. Yes, Mr. Polich claims that Montana-Dakota's North Dakota electric utility operations "have a higher risk than other electric utilities because of the percentage of coal generation, is a poor assumption".[3] He further claims that "With the change in federal administration at the US Environmental Protection Agency (EPA) it is likely that the concerns due to recent pollution regulations will be minimal, including those associated with the Clean Power Plan ("CPP")."[4]

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[2] *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 591, 603 (1944).

[3] *See* Direct Testimony of Richard A. Polich, at 21, lines 27-29.

[4] *See* Direct Testimony of Richard A. Polich, at 22, lines 3-6.

Q9. Do you agree with his assessment?

A9. No. As discussed in my Direct Testimony, the risks associated with heavy-reliance on coal is not due solely to the implementation of CPP. First, utilities with generation that is heavily weighted toward one fuel source face greater risks that adverse circumstances will arise that render much of their generating capacity uneconomic.[5] Additionally, as natural gas prices remain at historically low levels, coal-fired generation faces an increased risk of becoming uneconomic. In fact, most new generation constructed in recent years has been fueled with natural gas as a result of low natural gas prices, and new generating technologies, or wind power due to various subsidies and mandates for renewable generating technologies.[6]

It is too soon to tell the extent to which the risks created by the CPP and other EPA initiatives aimed at coal plants will be substantially eliminated. Risk associated with competition from natural gas and renewables has not changed appreciably as a result of the election and, thus, the ultimate conclusions are unchanged.

Q10. Does Mr. Polich provide other reasons that may make change the relative risk of Montana-Dakota's North Dakota electric utility operations?

A10. Yes, Mr. Polich claims that that the relative risk of Montana-Dakota's North Dakota electric utility operations is reduced because North Dakota allows utilities to implement interim rates while requested rate increases proceed through the

[5] Direct Testimony of J. Stephen Gaske, pages 37.

[6] Direct Testimony of J. Stephen Gaske, pages 38.

regulatory process[7] and also allows direct pass through of fuel and purchased power costs as well as a number of other riders.[8] However, these practices are common in other jurisdictions and do not significantly distinguish Montana-Dakota's North Dakota electric operations from other electric utilities in the proxy group. As noted in my filed Direct Testimony, Regulatory Research Associates rates the regulatory climate in North Dakota as Average/1. Thus, these operations have average regulatory risk in comparison with other utilities.

Mr. Polich also suggests that the price risk of MDU's generation resources is mitigated because "it is part of the MISO Regional Transmission Organization."[9] Virtually all major utilities are part of a regional transmission organization (RTO), so this does not distinguish Montana-Dakota from any proxy company.

Q11. Mr. Polich suggests that if "a utility has a higher risk, that risk would be reflected in lower stock prices and is already reflected in the information contained in the Value Line data."[10] Is that evaluation correct?

A11. No. His observation ignores the fact that Montana-Dakota's North Dakota electric operations do not have publicly-traded stock and is not followed by Value Line. That is the primary reason why we need to analyze proxy companies to estimate the cost of capital for these operations. Thus, the higher risk of the Montana-Dakota

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7 *See* Direct Testimony of Richard A. Polich, at 22.
8 *See* Direct Testimony of Richard A. Polich, at 22.
9 *See* Direct Testimony of Richard A. Polich, at 22.
10 *See* Direct Testimony of Richard A. Polich, at 23.

North Dakota electric operation is not reflected in stock prices or any information contained in Value Line.

Although I tried to select proxy companies that were as similar as possible to Montana-Dakota, there were some significant risk differences that remain. As explained in my Direct Testimony, the typical proxy company has a more diversified economy, less exposure to a boom and bust petroleum market in its service territory, and is between 26 and 32 times larger than Montana-Dakota's jurisdictional electric operations.[11] These risk differences are unavoidable because there are no comparably-sized, publicly-traded companies with analysts' consensus growth rate estimates. The higher rate of return required by smaller utility operations has been demonstrated empirically.[12]

Q12. Does Mr. Polich provide any evidence to change your assessment that "Montana-Dakota's North Dakota electric utility operations face overall risks that are near the top of the range relative to those of the proxy companies"?

A12. No. As described in my Direct Testimony there are a multitude of reasons why Montana-Dakota's North Dakota electric utility operations face overall risks that are near the top of the range relative to those of the proxy companies. I have categorized the risks into four broad categories and described each risk factor in detail in my Direct Testimony. [13]

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[11] Direct Testimony of J. Stephen Gaske, at 36-38.

[12] Michael Annin, *Equity and the Small-Stock Effect*, Public Utilities Fortnightly, October 15, 1995.

[13] Direct Testimony of J. Stephen Gaske, pages 34-43.

III. DCF ANALYSIS

Q13. Please summarize Ms. Polich's DCF Analysis.

A13. Mr. Polich recommends an allowed rate of return on common equity of 8.53 percent based on a two-step DCF analysis. Mr. Polich developed a single six-month dividend yield for each company in his proxy group.[14] He then calculated a composite growth rate for each company using a growth rate based on analysts' earnings forecasts weighted at two-thirds and forecasted GDP growth rate with one-third weighting. He then calculated the ROE for each company by adding the expected dividend yield to the composite growth rate.

Q14. Do you agree with Mr. Polich's use of the growth rate of the United States Gross Domestic Product ("GDP") in a DCF analysis of the proxy companies?

A14. No. The U.S. GDP growth rate has little or no connection to the growth rates investors expect for these companies. Companies grow at different rates from each other for a variety of reasons related to the economy in their regions, their financing practices, diversification opportunities, and other reasons. Consequently, there is no reason to expect that an estimate based on U.S. GDP growth rates is as reliable as an estimate based on analysts' forecasts for the specific companies being analyzed.

It is important to note that the GDP growth rate is an average for all activities in the economy. At any given point in time, some companies or industries grow faster

[14] *See* Direct Testimony of Richard A. Polich, at 24-25.

than the economy while other companies or industries are declining. Thus, it is not unusual for some companies or industries to exceed the average GDP growth rate for significant periods of time.

That is why it is important to place primary reliance upon company-specific growth rate information in order to distinguish between sectors and companies with declining, or below average growth, and those that are expected to comprise the above-average growth sectors.

In addition, the use of GDP growth rates in Mr. Polich's DCF analyses is flawed in that it assumes that over the long-term, all companies in the proxy group converge to the same growth rate.

Q15. Do you believe that analysts' growth rates are a superior measure of long-term investor expectations?

A15. Although analysts' longest-term growth forecasts are typically expressed as five-year forecasts, these forecasts generally represent growth rate expectations for a longer period of time than the five-years expressed in the forecast. There is a large amount of literature that suggests analysts' growth rate forecasts are a superior measure of the long-term growth rate expectations that are reflected in stock prices. For example, Vander Weide and Carleton found that analysts' growth rate forecasts have a very highly significant relationship with stock prices. [15] This indicates that the analysts' estimates are an accurate estimator of long-term growth rate

[15] Vanderweide, J.H. and Carleton, W.T., "Investor Growth Expectations: Analysts vs. History," *The Journal of Portfolio Management*, Spring 1988, pp. 78-82.

expectations implicit in stock prices, even though the analysts' estimates are putatively five-year estimates. Similarly, "Marston, Harris and Crawford examine publicly available data from 1982-1985 and find that plausible measures of risk are more closely related to expected returns derived from a constant growth model than to those derived from multistage growth models." [16] In addition, Roger Morin cites several published studies which demonstrate that growth forecasts made by security analysts represent an appropriate source of DCF growth rates and are reasonable indicators of investor expectations. [17]

Q16. Did you conduct an analysis to examine how Mr. Polich's DCF estimates would change if he relied solely on analyst growth rate estimates instead of improperly blending GDP growth rates into the calculation?

A16. Yes. Exhibit No. JSG-4, Schedule 2 attached to this Rebuttal Testimony shows how the ROE recommended by Mr. Polich would change if he relied on analyst growth rate estimates instead of GDP growth rate. Using all his inputs and methods, except for relying solely on analyst growth rates, instead of including GDP growth rates in the calculation, the results range from 4.67 percent to 11.31 percent. Considering that Montana-Dakota's North Dakota operations have greater risks than the typical proxy company, and the fact that the DCF method appears to be producing results that are below the true cost of capital at this time, my

[16] F. Marston, R. Harris, and P. Crawford, "Risk and Return in Equity Markets: Evidence Using Financial Analysts' Forecasts," in *Handbook of Security Analysts' Forecasting and Asset Allocation*, J. Guerard and M. Gultekin (eds.), Greenwich, CT, JAI Press; as described in R. Harris and F. Marston, "Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts," *Financial Management*, Summer 1992, p. 64.

[17] Morin, Roget T, New Regulatory Finance, p. 298.

recommended rate of return is appropriately placed within the range established by this revised version of his DCF analysis.

Q17. Is Mr. Polich correct in his description and assessment of the 0.625g dividend yield adjustment factor that you recommend?

A17. No, he is not. Mr. Polich's first error in this regard occurs on page 14, lines 20-22 of his Direct Testimony when he states that my 0.625g dividend yield adjustment factor is inappropriate and that "the use of dividend multiplier of (1 + 0.5g) is the recognized normal method of adjusting the dividend yield for quarterly dividend payments."[18] The adjustment of quarterly dividend payments by 1+0.625g to account for future growth has a sound foundation in financial and academic theory. Equation (1) in my Prepared Direct Testimony provides the mathematical formula that demonstrates the proper increase in the current quarterly dividend, D, by multiplying that dividend times 1+0.625g. In addition, attached to this Rebuttal Testimony as Attachment A is a paper which explains in more detail the mathematical derivation of my dividend yield adjustment factor, (1 + .625g).

Additionally, I disagree with Mr. Polich's assertion that "inflating the dividend multiplier to reflect an average of the timing for the payment of dividends results in double counting for market timing." [19] As shown in Attachment A, the .625 adjustment factor reflects the most reasonable assumptions regarding the timing of dividends.

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[18] *See* Direct Testimony of Richard A. Polich, at 14.

[19] *See* Direct Testimony of Richard A. Polich, at 15, lines 3-5.

IV. FLOTATION COST ADJUSTMENT

Q18. Mr. Polich claims that "any flotation costs for existing common equity has already been paid for by MDU ratepayers and is reflected in MDU's capital cost structure." Is that correct?

A18. No. Flotation costs are not recorded on the books of the company. Instead, only the net proceeds after flotation costs is recorded as common equity. Moreover, I am not aware of any ratemaking or regulatory accounting convention that provides for the amortization and recovery of past flotation costs associated with issuing common equity.

Q19. Mr. Polich asserts that the "inclusion of flotation costs in the ROE calculation would result in double recovery of costs and compensate MDU for costs they are not likely to incur."[20] Is that correct?

A19. No. Mr. Polich mis-states the purpose of my flotation cost adjustment. As I explained in my Direct Testimony:

> A more important purpose of a flotation cost adjustment is to establish a return that is sufficient to enable a company to attract capital on reasonable terms. This fundamental requirement of a fair rate of return is analogous to the well-understood basic principle that a firm, or an individual, should maintain a good credit rating even when they do not expect to be borrowing money in the near future. Regardless of whether a company can confidently predict its need to issue new common stock several years in advance, it should be in a position to do so on reasonable terms at all times without dilution of the book value of the existing investors' common equity. This

[20] *See* Direct Testimony of Richard A. Polich, at 15, lines 18-20.

> requires that the flotation cost adjustment be applied to the entire common equity investment and not just a portion of it. [21]

The primary purpose of the flotation cost adjustment is to be consistent with the capital attraction standard which requires that the return be sufficient to enable the company to raise capital on reasonable terms on a forward-looking basis. In this regard, it is similar to an insurance premium. A company is not required to show that it has had accidents or catastrophes in the past in order to include an insurance premium in its cost of service. Instead, the point of the insurance premium is to ensure that the company can pay for *future* costs that may or may not ever materialize. Mr. Polich's suggestion that flotation costs can only be recovered after the fact misses the entire point of the capital attraction standard.

Q20. Mr. Polich also contends that "multiplication of the investor required return by the flotation cost adjustment is wrong mathematically and would result in MDU over recovering the flotation costs by 64%". [22] Is he correct?

A20. No. There are several incorrect assumptions in the calculation that Mr. Polich presents in his Exhibit PSC-5.

First, he assumes that the entire amount of equity issued (i.e. $100 million in his example) will go into the rate base. Actually, only the net proceeds after deduction of flotation costs can be used to purchase plant and equipment that will be included in rate base and also recovered through depreciation. As a result, instead of $100

[21] Direct Testimony of J. Stephen Gaske, pages 20-21.

[22] *See* Direct Testimony of Richard A. Polich, at 17, lines 10-12.

million being included in rate base and depreciated in Mr. Polich's example, only the net proceeds of $96.8 million will be included in rate base and earn a return. In addition, only $96.8 million in depreciation will be collected on the investment, despite the fact that investors will have provided $100 million in capital.

Second, Mr. Polich calculates what he refers to as the flotation cost recovery resulting from an adjustment to the allowed rate of return. In his example, he simply adds up the flotation cost "recovery" over a 40-year period without considering the time-value of money. The correct way to compute over- or under-recovery is to compute the net present value ("NPV") of the stream of cash flows associated with flotation costs during the 40-year period.

Third, because the $3.2 million in flotation costs is not included in rate base to earn a return, and it is not recovered through depreciation, the NPV calculation of flotation cost recovery in Mr. Polich's example must include the $3.2 million as a negative cash flow at the beginning of the 40 years.

Q21. Did you calculate the net present value ("NPV") that would result if the incorrect assumptions in Mr. Polich's Exhibit PSC-5 are corrected?

A21. Yes. The corrected calculations are shown on Exhibit No. JSG-4, Schedule 3. When the net proceeds of $96.8 million are included in rate base and depreciated over 40 years, and the appropriate NPV calculation is made, the result is a negative net present value of $950,000. In other words, a correct version of Mr. Polich's calculation indicates that a flotation cost adjustment to the allowed rate of return

would still be insufficient to fully compensate investors for the entire amount of their $100 million investment.

Q22. Mr. Polich states that if "MDU elects to issue future common equity, MDU can request recovery of the cost of issuing new common equity in a future rate proceeding". Do you agree with this assessment?

A22. No, for the reasons explained in my Direct Testimony and summarized above, the primary goal of the flotation cost adjustment is to increase the value of the company sufficiently to enable the company to issue new shares without diluting the value of the existing shareholders' equity. The flotation cost adjustment I proposed is not intended to recover the actual flotation cost incurred retrospectively.

Q23. Is there support in academic literature for your approach, which multiplies the entire return by a specified factor to adjust for flotation costs?

A23. Yes. Myron Gordon, who is credited with developing the constant growth DCF model for estimating rate of return, has stated that a regulatory agency should set the allowed rate of return greater than the investor return requirement so as to allow the firm to issue stock at a price that will yield net proceeds equal to book value. Professor Gordon advocates the following adjustment:

> *The agency need only estimate the proportion that the proceeds per share on an issue bear to the price of the stock and adjust the allowed rate of return so that the price per share is the indicated ratio of the book value per share. If the proceeds on an issue are 91 percent of market price, the agency should maintain market price at about 110 percent of book value.*[23]

[23] Myron J. Gordon, *The Cost of Capital to a Public Utility*, Michigan State University, 1974, pp 165-166.

In order to meet this requirement, the flotation cost adjustment must be applied to the entire rate of return. The flotation cost adjustment that I have proposed attempts to meet the same standard.

V. EFFECT OF MARKET CONDITIONS ON DCF RESULTS

Q24. At pages 18-21 of his testimony, Mr. Polich argues that current market interest rates are not abnormal. Do you agree with that position?

A24. No. As I discussed at pages 13-17 of my filed Direct Testimony, the Federal Reserve has held the federal funds rate at exceptionally low levels. In fact, when inflation is considered, the Federal Reserve has been holding the real interest rate at negative levels which is counter to what one would expect in normal, rational markets. In addition, the Federal Reserve has been purchasing massive amounts of federal government debt. In 2007, the Federal Reserve held $745 million in federal government debt, but these holdings grew to a current level of $4.2 trillion. This is significant because $3.5 trillion was not "invested" by real investors in the market. Instead, the Federal Reserve used its power to create money to pump up the markets artificially. As a result, the current level of interest rates does not reflect the return that actual investors would require on these securities. These actions have had a ripple effect on the economy driving down interest rates on other securities.

Mr. Polich cites an economist who claims that if interest rates are abnormally low we should have seen accelerating inflation. However, the lack of inflation in the face of massive federal "stimulus" is a frequently discussed puzzle to economists. Instead of stimulating spending and investment, with resulting inflation, individuals, banks and

corporations have simply held much of the newly-created money in cash, short-term balances and bidding up the prices of common stocks. Thus, the lack of inflation and sluggish economic growth for the past several years is an additional sign of abnormal conditions in the market.

Q25. Do abnormal market conditions mean that one should ignore the results of your DCF analysis, or a corrected version of Mr. Polich's DCF analysis?

A25. No. However, greater consideration should be given to other rate of return estimation methods which indicate that the current DCF results likely indicate a return that is less than the current cost of capital. As described at pages 16-17 of my filed Direct Testimony, this is the conclusion that FERC reached in several recent decisions and I agree with that assessment.

Q26. At page 13, line 17-19 and page 25, lines 4-8 of his testimony, Mr. Polich cites a decision and Staff testimony in two recent FERC proceedings as the basis for his DCF method and analysis. Did FERC adopt the median DCF result in those proceedings?

A26. No. The FERC determined that the median DCF results produced by Mr. Polich's method were between 146 and 185 basis points too low to be reasonable.

In FERC Opinion No. 531, which Mr. Polich cites as justification for his DCF approach, the FERC DCF analysis produced a median return of 9.11 percent for the

electric utilities in its proxy group[24] but the FERC determined that the base required rate of return was **10.57 percent**.[25]

Similarly, in the more recent Opinion No. 551, the FERC Staff DCF analysis indicated a median return of 8.47 percent[26] (nearly identical to Mr. Polich's 8.53 percent in this proceeding), but FERC determined that 8.47 percent was unreasonably low and, instead, adopted an allowed return on equity of **10.32 percent**.[27]

As I discussed in my filed Direct Testimony, FERC rejected the mid-point of the DCF range because of "economic conditions that could render inputs to the DCF analysis unrepresentative."[28] Instead, in recent decisions FERC also examined alternative metrics such as the risk premium approach,[29] capital asset pricing model ("CAPM")[30] with a size adjustment, [31] the Value Line ("VL") forecast of returns on book value

[24] Calculated from Appendix table in FERC Op. No. 531, 147 FERC ¶61,234 (2014), Slip Op., pages 82-83.

[25] FERC Op. No. 531, 147 FERC ¶61,234 (2014); aff'd in Opinion No. 531-B, 150 FERC ¶61,165 (2015).

[26] Testimony of FERC Staff witness Robert J. Keyton, FERC Docket No. EL14-12-002, Exhibit No. S-2, Schedule 7, page 7.

[27] FERC Op. No. 551, 156 FERC ¶ 61,234 (Sept. 28, 2016), P. 275.

[28] Direct Testimony of J. Stephen Gaske, page 16, line 5 to page 17, line 20.

[29] *Ibid., "... we find that [the] risk premium analysis is sufficiently reliable to corroborate our decision to place [the] base ROE above the mid-point of the zone of reasonableness produced by the DCF analysis."* (P. 195).

[30] *Ibid., " ... The CAPM methodology supports the Commission's determination that the mechanical application of the DCF methodology results in an ROE that is inconsistent with Hope and Bluefield."* (P. 165).

[31] *Ibid.,* The decision approved the use of the Ibbotson/Morningstar size adjustment to the CAPM results because *"... such an adjustment was 'a generally accepted approach to CAPM analyses'"* and "*'[t]he purpose of the size adjustment is to render the CAPM useful in estimating the cost of capital for companies that are smaller than the companies that were used to determine the market risk premium.'"* (P. 166).

expected for the proxy companies,[32] and returns allowed by other commissions.[33]

Q27. Did you also examine similar alternative metrics to determine a reasonable allowed rate of return for Montana-Dakota's North Dakota electric operations?

A27. Yes. The results of those analyses are:

Method	ROE
Risk Premium (electric utilities)[34]	9.94%
CAPM (proxy companies)[35]	10.48%
VL Expected Returns (proxy companies)[36]	10.25%
Allowed Returns in Electric Proceedings[37]	9.87%
AVERAGE	**10.14%**

These alternative metrics are all close to, or greater than, my recommended rate of return of 10.00 percent; and they are far above the 8.53 percent recommended by Mr. Polich. These alternative metrics suggest that the DCF method currently produces results that are less than the true cost of capital for long-term investments in utility plant and equipment. When these alternative metrics are considered in conjunction with the fact that Montana-Dakota's North Dakota electric operations have above-

[32] *Ibid., "The returns on book equity that investors expect to receive from a group of companies with risks comparable to those of a particular utility are relevant to determining that utility's market cost of equity, because those returns on book equity help investors determine the opportunity cost of investing in that particular utility instead of other companies of comparable risk. Such a calculation is consistent with the requirement in Hope that 'the return to the equity owner should be commensurate with returns on investment in other enterprises having corresponding risks.'"* (P. 235).

[33] *Ibid., "A study demonstrating that the vast majority of state authorized ROEs studied exceed the midpoint of the zone of reasonableness suggests that the midpoint of that zone may be too low ..."* (P. 251).

[34] Exh. JSG-2, Schdl. 5, page 3

[35] Exh. JSG-2, Schdl. 7, page 1

[36] Exh. JSG-4, Schdl. 1

[37] Exh. JSG-3, Fig. 1.

average risks, my 10.00 percent return on equity recommendation in this proceeding is clearly reasonable.

Q28. Does this conclude your Prepared Rebuttal Testimony?

A28. Yes.

DOES THE FERC DCF MODEL REFLECT THE COMMISSION'S REASONING?

by
J. Stephen Gaske
Vice President, H. Zinder & Associates

In its Order No. 420, issued May 20, 1985, the Federal Energy Regulatory Commission specified that the following Discounted Cash Flow (DCF) rate of return model should be used in establishing the annual generic benchmark rate of return for electric utilities[1]:

$$k = \frac{Do}{Po} [1 + .5 g] + g \qquad (1)$$

where,

k = the cost of common equity capital

Do = the current annual dividend (most recent quarterly dividend multiplied by four)

Po = the current price per share

g = the expected annual dividend growth rate.

In subsequent generic rate of return proceedings the Commission has reaffirmed the use of this model,[2] even though it fails to reflect the Commission's own assumptions regarding the payment of dividends. Whether any given cost-of-capital model is "correct" depends on how well it reflects reasonable assumptions. The purpose of this article is to demonstrate the contrast between the FERC DCF rate of return model and the Commission's stated assumptions regarding the pattern of dividends and dividend increases expected by investors on average.

The reasoning used to justify the FERC DCF model in Order

Gaske

No. 420 was apparently an attempt to split the difference between the basic constant growth DCF model which assumes that dividends are received annually:

$$k = \frac{Do}{Po}\left[1 + g\right] + g \qquad (2)$$

and the constant growth DCF model which assumes that dividends are received continuously:

$$k = \frac{Do}{Po} + g \qquad (3)$$

The Commission believed, with justification, that a realistic model would yield cost of capital estimates that fall somewhere between the estimates produced by equations (2) and (3).

FERC Assumptions

In its Order No. 442, FERC described the assumptions that it thought would be reflected in its DCF model (equation (1)) when it wrote the following:

> The Commission's analytical process in deciding to reevaluate the model formulation was to start with the general form of the DCF model and make certain assumptions. The first two are the standard assumptions that dividends grow at the same rate each year, and that the required rate of return is the same in every period. The next two assumptions reflect (1) the fact that dividends are paid quarterly, and (2) that the annual dividend increase, on average, occurs halfway through the year. The latter assumption was made in the model used in Order No. 420. The Commission there noted that "from the perspective of the average company or the average investor, the next dividend increase is a half year away."3 (emphasis added)

The Commission reiterated its assumption that a dividend increase occurs at mid-year for the typical utility at several other

points in Order No. 442.[4] In addition, both the Commission and Staff, in its analyses, have consistently adopted the implicit assumption that the next quarterly dividend will be received in three months.

The DCF model adopted by FERC does not reflect the Commission's assumptions expressed in various orders, however. To see why, it is helpful to assume a hypothetical utility that pays quarterly dividends on a calendar basis on March 31, June 30, September 30, and December 31 each year. Annual dividend increases occur with the fourth quarterly dividend paid each year. If we assume that the middle of the year occurs on July 1, the next end-of-year dividend increase is six months (or a "half year") away.

Analogously, the FERC model assumes that the middle of the calendar year occurs on April 1 and that, on average, annual end-of-year dividend increases are nine months away. This modelling error is described in greater detail in the next section.

Alternatively, the FERC model can be derived by assuming that, on average, the next annual dividend increase is expected in six months, but that the next quarterly dividend payment is expected today. Neither FERC nor its Staff has ever expressed or implied the assumption that, on average, investors expect to receive the next dividend today, however.

A Model Based On FERC Assumptions

If we assume that the middle of the year occurs on July 1, the investor can expect the next dividend at the current rate in three months and the end-of-year dividend increase in six months.

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Incorporating the assumptions that "the next dividend increase is a half year away" and the next dividend is one quarter away results in the following DCF model:

$$k = \frac{Do}{4Po}\left[(1+k)^{.75} + \frac{(1+g)}{(1+k)^{.5}} + \frac{(1+g)}{(1+k)^{.25}} + (1+g)\right] + g \quad (4)$$

The only difference between this model and the FERC model is that this model multiplies the second term in brackets by 1+g. Equation (4) assumes that the next dividend at the current rate will be received in three months, or one-quarter year. The $(1+k)^{.75}$ term in brackets is associated with this first dividend. The second dividend is assumed to be received in six months, or one-half year. To be consistent with the Commission's assumptions, the model shown in equation (4) represents the dividend to be received "a half year away" as including the annual dividend increase, hence, the second term in brackets is $(1+g)(1+k)^{.5}$.

To see the difference in results between this model and the FERC model, assume that a utility currently pays a quarterly dividend of $0.25 per share, that its stock price is $10.00, and that investors expect an annual average rate of growth of five percent. Under these assumptions the FERC model estimates that investors require a rate of return of 15.83 percent while the equation (4) model indicates a required rate of return of 15.97 percent.

Elimination of Dividend Reinvestment Income

The investor required rate of return estimated using equation (4) overstates the required rate of return for

ratemaking since it includes the return that investors expect to earn during part of the year by reinvesting the dividends received in the first three quarters of the year.

In an appendix to the FERC Staff Report on Ratemaking Rate of Return that accompanied Order No. 442-A, Staff begins with the version of equation (4) which assumes that, on average, the next dividend increase is expected in nine months and the next dividend is to be received in three months. From this model Staff then proceeds to demonstrate that elimination of the dividend reinvestment portion of the return from the market required rate of return (Staff's version of equation (4)) leads to equation (1).

If, instead, we begin with the Commission's assumption that "the next dividend increase is a half year away," equation (4) describes investors' effective market required rate of return, k-mkt. The required rate of return estimated using this model includes the partial year return which investors have an opportunity to earn on their own by reinvesting the first three quarterly dividends. The portion of the effective market rate of return that is associated with dividend reinvestment is:

$$\text{k-div} = \frac{Do}{4Po}\left\{\left[(1+k)^{.75}-1\right]+(1+g)\left[(1+k)^{.5}-1\right]+(1+g)\left[(1+k)^{.25}-1\right]\right\} \quad (5)$$

Subtracting equation (5) from equation (4) yields the following required ratemaking rate of return, k-reg:

$$(\text{k-mkt}) - (\text{k-div}) = \frac{Do}{4Po}\left[1 + (1+g) + (1+g) + (1+g)\right] + g$$

$$= k\text{-reg} = \frac{Do}{Po} [\ 1 + .75\ g\ ] + g \qquad (6)$$

Equation (6) is the DCF model that correctly reflects the Commission's stated assumptions regarding the timing of dividends and dividend increases. For a utility with a current dividend of $0.25 per share, stock selling at $10.00 and an expected growth rate of five percent, this model indicates that the required return for ratemaking is 15.375 percent as opposed to the 15.25 percent indicated by the FERC model (equation (1)). Use of a DCF model in the form of equation (6) will result in an allowed benchmark rate of return equal to the cost of common equity capital for the typical utility under the assumptions that there are quarterly dividends, the next dividend increase is a half year away, and the next dividend is expected in three months. These are the assumptions that FERC has consistently expressed or implied in its various Orders.

An Alternative Model

Since the time that Order No. 420 was issued, FERC has reconsidered its use of the equation (1) model, but in Order Nos. 442-A, 461 and 489 the Commission decided to continue using this model. Apparently, FERC is unaware of the discrepancy between its model and the assumptions that it believes are reflected in its model. This discrepancy is particularly apparent in Order No. 461 where the Commission used a numerical example to demonstrate that its model "...attempts to approximate the average amount of dividends that the average investor (or, equivalently, investors in the average company) would expect to receive during the first

TABLE 1

ORDER NO. 461 EXAMPLE

Dividend Increased During Quarter	Dividend Received 3/31	6/30	9/30	12/31	Total
1	$0.25	$0.25	$0.25	$0.26	$1.01
2	$0.25	$0.25	$0.26	$0.26	$1.02
3	$0.25	$0.26	$0.26	$0.26	$1.03
4	$0.26	$0.26	$0.26	$0.26	$1.04
				Average	$1.025

.025/.05 = .5

.025/.04 = .625

TABLE 2

CORRECTED EXAMPLE

Dividend Increased During Quarter	Dividend Received 3/31	6/30	9/30	12/31	Total
1	$0.25	$0.25	$0.25	$0.2625	$1.0125
2	$0.25	$0.25	$0.2625	$0.2625	$1.0250
3	$0.25	$0.2625	$0.2625	$0.2625	$1.0375
4	$0.2625	$0.2625	$0.2625	$0.2625	$1.0500
				Average	$1.03125

.03125/.05 = .625

year."[5] The numerical example in the Order contained a significant mathematical error, however.

The Order No. 461 example was designed to show the average portion of the expected annual dividend growth rate that an investor would expect to receive during the first year if the annual dividend increase has an equal probability of occurring in any of the next four quarters. The example, reproduced in Table 1, assumes that the stock is purchased on January 1, the most recent quarterly dividend was $0.25 per share, and the dividend growth rate is five percent.

Although it started with the assumption that the dividend growth rate is five percent, the Order No. 461 example erroneously proceeded to show the average dividends that would be paid each quarter if the growth rate is four percent. This can be seen in Table 1 by observing that the increased dividend is $0.26 rather than the $0.2625 which would be required for a five percent growth rate.

The Order No. 461 example divided the average first year dividend increase associated with a four percent growth rate, 2.5 percent, by the five percent growth rate to conclude that the dividend yield multiplier should be [1 + .5g]. However, dividing the average dividend increase in the example by four percent--the increase actually employed in the Order No. 461 example--leads to the conclusion that the Commission's reasoning in Order No. 461 requires the dividend yield multiplier to be [1 + .625g]. The same conclusion is also reached in Table 2 which reflects a five percent annual dividend growth rate and divides the average first year dividend increase by five percent.

Order No. 461 did not provide a reasonable justification for the FERC DCF model. It was only by coincidence that the mathematical error in the example happened to lead, erroneously, to the conclusion that the FERC model correctly reflected the Commission's assumptions. By the reasoning in Order No. 461, if the mathematical error is corrected, the Commission should be using the following DCF model:

$$k = \frac{Do}{Po} [\ 1 + .625\ g\ ] + g \qquad (7)$$

Although the .625 growth rate factor in equation (7) is at the mid-point between the .75 factor in equation (6) and the .5 factor in the FERC model (equation (1)), equation (7) cannot be derived directly from any reasonable set of assumptions regarding the timing of dividends and dividend increases. It is clearly reasonable to assume that, on average, the next annual dividend increase is a half year away. Both equations (1) and (6) can be derived from this assumption.

On the other hand, since the next quarterly dividend, on average, will be received at the mid-point between today, as assumed in equation (1), and three months from today, as assumed in equation (6), equation (7) could be considered to be an ad hoc model representing a simple average of the dividend timing assumptions in the alternative models given by equations (1) and (6).

Conclusions

As this article points out, Order No. 442 contains a modelling error and Order No. 461 contains a mathematical error

in translating the Commission's stated reasoning into an appropriate model for establishing the generic rate of return. As a result, the FERC DCF model does not reflect a reasonable set of assumptions.

It is not posible to construct a quarterly dividend model that satisfies both the assumption that the next dividend increase is a half year (2 quarters) away and the assumption that the next dividend payment is a half quarter away. Equation (7) could be justified as an approximate adjustment to account for the average time until the next quarterly dividend payment. However, since FERC has consistently expressed the assumptions that the next dividend is a full quarter away[6] and the next dividend increase is a half year away, the only model that correctly reflects the Commission's assumptions is equation (6).

Although the difference between equation (6) and the FERC model is likely to lead to a rate of return difference of only 10-12 basis points, the total dollars involved on an industry-wide basis are quite substantial. This is particularly true if other commissions look to the FERC generic rate of return formula as the proper method. The Commission rejected the models given by equations (2) and (3) because those models did not properly reflect reasonable assumptions regarding the timing of dividends and dividend increases. After devoting a great deal of time and effort to establishing reasonable assumptions in its various generic rate of return proceedings, it would be a shame for FERC to continue to use a DCF model that, because of simple mathematical errors, fails to reflect those assumptions.

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NOTES

1. FERC Order No. 420, 50 Fed. Reg. at 30,208 (May 29, 1985).

2. FERC Order No. 442-A, 51 Fed. Reg. 22,505 (June 20, 1986); FERC Order No. 461, 52 Fed. Reg. 11 (Jan. 2, 1987); FERC Order No. 489, 53 Fed. Reg. 3,342 (Feb. 5, 1988).

3. FERC Order No. 442, 51 Fed. Reg. 343 (Jan. 6, 1986) at page 19 of the original order.

4. For example, at page 22 of Order No. 442 the Commission quotes the language of Order No. 420 in stating that "...from the perspective of the average company or the average investor, the next dividend increase is a half year away." Similarly, page 23 of Order No. 442 contains the assertion that "(t)he Commission's model assumes a dividend increase occurs at mid-year for the typical utility."

5. FERC Order No. 461 (pages 17-18), quoting Order No. 420, 50 Fed. Reg. at 21,806.

6. For example, see equation (6) at page 19 of Order No. 442 and page 26 where the Commission describes its assumptions.

Montana-Dakota Utilities Co.

Selected Electric Distribution Companies
Value Line ROE

Company Name	Ticker	Value Line Projected ROE	
ALLETE, Inc.	ALE	9.0%	2
Alliant Energy Corporation	LNT	12.5%	2
American Electric Power	AEP	10.5%	2
Ameren Corp	AEE	9.5%	2
Avista Corp	AVA	8.0%	
Black Hills Corp	BKH	11.0%	
CMS Energy	CMS	13.5%	
Consolidated Edison	ED	8.5%	
DTE Energy	DTE	10.5%	2
Edison International	EIX	11.5%	
El Paso Electric	EE	9.5%	
Exelon Corp	EXC	9.5%	
IDACORP, Inc	IDA	9.0%	
NorthWestern Corp	NWE	10.0%	
OGE Energy Corp	OGE	11.5%	
Otter Tail Corp	OTTR	10.0%	2
PG&E Corp	PCG	10.0%	
Pinnacle West	PNW	10.0%	
PNM Resources, Inc	PNM	9.5%	2
Portland General	POR	8.5%	
PPL Corp	PPL	14.0%	
Public Service Enterprise	PEG	11.5%	
SCANA Corp	SCG	10.0%	
Sempra Energy	SRE	13.5%	
Southern Co.	SO	11.0%	
Vectren Corp	VVC	13.0%	
WEC Energy Group	WEC	11.0%	
Xcel Energy Inc.	XEL	10.5%	2

Average	**10.59%**
Median	**10.25%**

1/ Value Line Projection for 2019-2021 or 2020-2022

2/ Also in Gaske Proxy Group.

Source: Direct Testimony of Richard A. Polich, Exhibit No. PSC - 4 and Value Line Report; dated Dec 16, 2016, Jan 27, 2017, and Feb 17, 2017

Montana-Dakota Utilities Co.

Mr. Polich's DCF Analysis with Corrected Growth Rates

Line No.	Company	Ticker	Standard & Poor's Corporate Credit Rating	Moody's Long Term Issuer or Sr Unsecured Rating	Value Line Safety Rank	Six Month Average Dividend Yld	IBES Analysts' Proj EPS g	Adjusted Dividend Yield	DCF ROE Ke
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
1	ALLETE	ALE	BBB+	A3	2	3.38%	5.00%	3.46%	8.46%
2	Alliant Energy	LNT	A-	Baa1	2	3.12%	6.00%	3.21%	9.21%
3	Amer. Elec. Power	AEP	A-	Baa1	2	3.63%	1.49%	3.66%	5.15%
4	Ameren Corp.	AEE	BBB+	Baa1	2	3.42%	5.85%	3.52%	9.37%
5	Avista Corp.	AVA	BBB	Baa1	2	3.36%	5.65%	3.45%	9.10%
6	Black Hills Corp.	BKH	BBB	Baa2	2	2.80%	8.39%	2.92%	11.31%
7	CMS Energy	CMS	BBB+	Baa2	2	2.97%	7.26%	3.08%	10.34%
8	Consol. Edison	ED	A-	A3	1	3.62%	2.02%	3.66%	5.68%
9	DTE Energy	DTE	BBB+	Baa1	2	3.29%	5.51%	3.38%	8.89%
10	Edison Int'l	EIX	BBB+	A3	2	2.72%	1.92%	2.75%	4.67%
11	El Paso Electric	EE	BBB	Baa1	2	2.70%	6.50%	2.79%	9.29%
12	Entergy Corp.	ETR	BBB+	Baa3	3				
13	Exelon Corp.	EXC	BBB	Baa2	3	3.74%	5.95%	3.85%	9.80%
14	IDACORP, Inc.	IDA	BBB	Baa1	2	2.72%	4.10%	2.78%	6.88%
15	NorthWestern Corp.	NWE	BBB	A3	3	3.50%	4.34%	3.58%	7.92%
16	OGE Energy Corp.	OGE	A-	A3	2	3.70%	4.00%	3.77%	7.77%
17	Otter Tail Corp.	OTTR	BBB	NR	2	3.43%	6.00%	3.53%	9.53%
18	PG&E Corp.	PCG	BBB+	Baa1	3	3.21%	5.67%	3.30%	8.97%
19	Pinnacle West	PNW	A-	A3	1	3.37%	5.30%	3.46%	8.76%
20	PNM Resources, Inc.	PNM	BBB+	Baa3	3	2.68%	6.85%	2.77%	9.62%
21	Portland General	POR	BBB	A3	2	3.00%	6.60%	3.10%	9.70%
22	PPL Corp.	PPL	A-	Baa2	2	4.43%	2.44%	4.48%	6.92%
23	Public Serv. Enterprise	PEG	BBB+	Baa2	1	3.85%	1.17%	3.87%	5.04%
24	SCANA Corp.	SCG	BBB+	Baa3	2	3.21%	5.70%	3.30%	9.00%
25	Sempra Energy	SRE	BBB+	Baa1	2	2.91%	6.50%	3.00%	9.50%
26	Southern Co.	SO	A-	Baa2	2	4.47%	3.14%	4.54%	7.68%
27	Vectren Corp.	VVC	A-	NR	2	3.26%	4.57%	3.33%	7.90%
28	WEC Energy Group	WEC	A-	A3	1	3.36%	6.73%	3.47%	10.20%
29	Xcel Energy	XEL	A-	A3	1	3.33%	5.65%	3.42%	9.07%
30	**Median**								**8.99%**
31	Average								8.42%
32	Low								4.67%
33	High								11.31%

Montana-Dakota Utilities Co.

Corrections to Mr. Polich's PSC-5 Flotation Cost Analysis

Assumptions:

Equity Issued ($)	100	Million
Flotation Cost ($)	3.2	Million
Rate Base & Book Equity ($)	96.8	Million
Life Cycle of Asset	40	Years
Depreciation Method	Straight-line	
Flotation Cost (%)	3.20%	
ROE	8%	

Recovered Flotation Cost:	5.08	Million
Mr. Polich's Claimed Percent over recovery	58.75%	
NPV of Flotation Cost Recovery:	**($0.95)**	**Million**

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Year	Common Equity	Depreciation Reserve	ROE	ROE w flotation costs	Flotation cost recovery	Total flotation cost recovered
0					(3.20)	
1	96.800	0.000	7.744	7.992	0.248	0.248
2	94.380	2.420	7.550	7.792	0.242	0.489
3	91.960	2.420	7.357	7.592	0.235	0.725
4	89.540	2.420	7.163	7.392	0.229	0.954
5	87.120	2.420	6.970	7.193	0.223	1.177
6	84.700	2.420	6.776	6.993	0.217	1.394
7	82.280	2.420	6.582	6.793	0.211	1.605
8	79.860	2.420	6.389	6.593	0.204	1.809
9	77.440	2.420	6.195	6.393	0.198	2.007
10	75.020	2.420	6.002	6.194	0.192	2.199
11	72.600	2.420	5.808	5.994	0.186	2.385
12	70.180	2.420	5.614	5.794	0.180	2.565
13	67.760	2.420	5.421	5.594	0.173	2.738
14	65.340	2.420	5.227	5.394	0.167	2.906
15	62.920	2.420	5.034	5.195	0.161	3.067
16	60.500	2.420	4.840	4.995	0.155	3.222

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Year	Common Equity	Depreciation Reserve	ROE	ROE w flotation costs	Flotation cost recovery	Total flotation cost recovered
17	58.080	2.420	4.646	4.795	0.149	3.370
18	55.660	2.420	4.453	4.595	0.142	3.513
19	53.240	2.420	4.259	4.395	0.136	3.649
20	50.820	2.420	4.066	4.196	0.130	3.779
21	48.400	2.420	3.872	3.996	0.124	3.903
22	45.980	2.420	3.678	3.796	0.118	4.021
23	43.560	2.420	3.485	3.596	0.112	4.132
24	41.140	2.420	3.291	3.397	0.105	4.238
25	38.720	2.420	3.098	3.197	0.099	4.337
26	36.300	2.420	2.904	2.997	0.093	4.430
27	33.880	2.420	2.710	2.797	0.087	4.516
28	31.460	2.420	2.517	2.597	0.081	4.597
29	29.040	2.420	2.323	2.398	0.074	4.671
30	26.620	2.420	2.130	2.198	0.068	4.739
31	24.200	2.420	1.936	1.998	0.062	4.801
32	21.780	2.420	1.742	1.798	0.056	4.857
33	19.360	2.420	1.549	1.598	0.050	4.907
34	16.940	2.420	1.355	1.399	0.043	4.950
35	14.520	2.420	1.162	1.199	0.037	4.987
36	12.100	2.420	0.968	0.999	0.031	5.018
37	9.680	2.420	0.774	0.799	0.025	5.043
38	7.260	2.420	0.581	0.599	0.019	5.061
39	4.840	2.420	0.387	0.400	0.012	5.074
40	2.420	2.420	0.194	0.200	0.006	5.080
41	0.000	2.420	0.000	0.000	0.000	5.080
Total:		**96.8**	**158.752**	**163.832**	**5.080**	

NPV (years 0-41) **($0.95)**