Exhibit No. NNG-00075

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

NORTHERN NATURAL GAS COMPANY	**)**	**DOCKET NO. RP19-59-000**

PREPARED ANSWERING TESTIMONY
OF
BENTE VILLADSEN

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SUMMARY OF PREPARED ANSWERING TESTIMONY
OF
BENTE VILLADSEN

Dr. Bente Villadsen provides answering testimony on behalf of Northern Natural Gas Company ("Northern") regarding return on equity ("ROE") and capital structure. In response to testimony recommending an ROE of 12.33 percent (Commission Trial Staff), 10.50 percent (Indicated Shippers), and 11.00 percent (Michigan PSC), Dr. Villadsen recommends an ROE of 14.3 percent.

Dr. Villadsen reviews the proxy companies proposed by other witnesses and assesses their business risk to determine whether they are suitable as proxies for Northern. Based on this analysis, she selects a proxy group of seven companies that own natural gas pipelines and applies the Commission's traditional discounted cash flow ("DCF") method as well as other cost of equity estimating methods to determine the ROE. Using the Commission's traditional DCF model with a weighted average of *IBES* and Value Line growth rates, Dr. Villadsen calculates an ROE of 14.3 percent. She supports her recommendation by the additional methods used in the NETO Briefing Order.[1]

Dr. Villadsen relies on the Answering Testimony of Northern Witness Dr. Paul Carpenter in Exhibit No. NNG-00079 to show that Northern has slightly higher business risk than the median of her proxy group. Consequently, there is no reason to place Northern below the median of the proxy group ROE as Trial Staff suggests. Moreover, Dr. Villadsen discusses the Commission's prior decisions and concludes that they do not support placing Northern below the median of the proxy group ROE.

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[1] *Coakley v. Bangor Hydro-Elec. Co.*, 165 FERC ¶ 61,030 (2018).

Finally, Dr. Villadsen proposes to use Northern's actual capital structure of 60.80 percent equity as of June 30, 2019. In response to the witnesses for the other participants who used data from prior periods, Dr. Villadsen finds that it is reasonable to use Northern's actual capital structure as of the end of the test period as it is consistent with the proxy group and FERC precedent.

GLOSSARY

Bps	basis points
CAPM	Capital Asset Pricing Model
DCF	Discounted Cash Flow
EEP	Enbridge Energy Partners
ENB	Enbridge Inc.
ENBL	Enable Midstream Partners
EPS	earnings per share
EQM	EQM Midstream Partners (formerly EQT)
MLP	Master Limited Partnership
MRP	Market Risk Premium
NEB	Canadian National Energy Board
NYSE	New York Stock Exchange
ROE	return on equity
SEP	Spectra Energy Partners
TRP	TC Energy Corp (formerly TransCanada)
TRSL	Thomson Reuters Spreadsheet Link
S&P	Standard & Poor's
TSE	Toronto Stock Exchange
WMB	Williams Companies, Inc.
WPS	Williams Partners

PREPARED ANSWERING TESTIMONY
OF
BENTE VILLADSEN

I. INTRODUCTION AND SUMMARY

Q. Please state your name, title, and business address.

A. My name is Bente Villadsen. I am a Principal at The Brattle Group's ("Brattle") Boston office located at One Beacon St., Suite 2600, Boston, MA 02108, USA.

Q. On whose behalf are you submitting testimony?

A. I am submitting testimony on behalf of Northern Natural Gas Company ("Northern").

Q. Please briefly summarize your professional qualifications and educational background.

A. I am a Principal of *The Brattle Group*, an economic, environmental, and management consulting firm with offices in Boston, Washington D.C., London, San Francisco, Madrid, Rome, New York, Toronto, Sydney, Brussels, and Chicago with specialties including financial economics, regulatory economics, and the gas, water, electric, and pipeline industries. My work concentrates on regulatory finance and accounting. As a Principal, I work in the areas of cost of capital, risk, regulatory accounting, regulatory precedent and related matters for regulated entities, regulators, or investors.

I am the co-author of the text, "Risk and Return for Regulated Industries" and I have testified or filed expert reports on cost of capital in Alaska, Arizona, California, Illinois, Michigan, New Mexico, New York, Oregon, and Washington, as well as before the Bonneville Power Administration, the Federal Energy Regulatory Commission ("FERC" or "Commission"), the Surface Transportation Board, the Alberta Utilities Commission, and

the Ontario Energy Board. I have provided white papers on cost of capital to the British Columbia Utilities Commission, the Canadian Transportation Agency as well as to European and Australian regulators on cost of capital. I have testified or filed testimony on regulatory accounting issues before the FERC, the Regulatory Commission of Alaska, the Michigan Public Service Commission, and the Texas Public Utility Commission as well as in international and U.S. arbitrations. In addition, I regularly provide advice to utilities on regulatory matters.

I hold a Ph.D. from Yale University's School of Management with a concentration in accounting. I also hold a Master of Science as well as a Bachelor of Science joint degree in mathematics and economics from University of Aarhus in Denmark.

Additional details regarding my professional experience and qualifications are contained in my résumé, which is attached as Exhibit No. NNG-00076.

Q. Have you previously testified before or submitted testimony to this Commission?

A. Yes. I have submitted testimony on cost of capital in Docket Nos. ER19-1553, RP19-1291, RP19-1353 and testimony on regulatory accounting matters before the Commission in Docket Nos. PA10-13-000 and EL11-13-000.

Q. What is the purpose of your answering testimony in this proceeding?

A. I have been asked by Northern to provide testimony regarding the appropriate rate of return on equity ("ROE") and capital structure for Northern in response to the Direct Testimony of Commission Trial Staff Witness Edward Alvarez III ("Alvarez Testimony"), the Direct Testimony of Indicated Shippers Witness Elizabeth H. Crowe ("Crowe Testimony") and the

Direct Testimony of Michigan Public Service Commission Witness Kirk D. Megginson ("Megginson Testimony").[2]

Q. How is your answering testimony organized?

A. First, I provide an overview of cost of capital issues and the Commission's approach to determining the appropriate ROE for regulated natural gas pipelines. Second, I discuss the appropriate ROE for Northern for the period ending June 30, 2019, in response to the proposals from the other witnesses who, among other things, use data from prior periods and inappropriate proxy groups. Third, I discuss the appropriate capital structure for the period ending June 30, 2019, in response to Staff Witness Alvarez who relies on data as of March 31, 2019 and Indicated Shippers Witness Crowe, who uses 62 to 65 percent equity for Northern.

II. OVERVIEW OF COST OF CAPITAL AND RISK

A. The Commission's DCF Calculation

Q. Before you respond to the other witnesses' proposals, could you please describe the Commission's approach to determining the ROE for a regulated natural gas pipeline?

A. The Commission has traditionally used a Discounted Cash Flow ("DCF") model that is a modification of the standard, constant-growth DCF model, where the dividend growth rate

[2] CenterPoint Witness Kenneth Sosnick stated that he had "not fully analyzed" the capital structure and ROE issues in this case, and that the historical inputs included in his cost of service from the FERC Form No. 501-G were "simply … for representative purposes." Exhibit No. CERC-0001 at 22-23; see also Exhibit No. NNG-00078 Response to NNG-CERC-2.6. In my opinion, the Commission should use an appropriate capital structure such as Northern's actual capital structure as of June 30, 2019. The Commission should also authorize an ROE for Northern consistent with market expectations (as discussed in my testimony), not simply import amounts from the Form No. 501-G or the most recent pipeline decision, neither of which relate to the current period. In any event, since Mr. Sosnick did not submit an independent analysis of these issues, I do not respond further to his testimony here.

is a weighted-average of the company's 5-year analyst growth rate estimates (⅔ weight), such as those provided by *IBES* or Bloomberg, plus a common long-term growth rate estimate (⅓ weight). Details of the approach are articulated in *Kern River*, as well as in *Williston Basin* and *Enbridge Pipelines (KPC)* ("*Enbridge*"). As the Commission stated in *Enbridge*:

> The Commission uses the Discounted Cash-Flow (DCF) methodology when calculating a range of reasonable rates of return on equity for natural gas pipelines. Under that methodology, the rate of return equals the dividend yield (stock price divided by dividends), plus the projected growth in dividends.
>
> For natural gas pipelines, the Commission uses a two-step procedure to determine the projected growth in dividends of the proxy group companies, averaging short-term and long-term growth estimates. The Commission uses five-year Institutional Broker's Estimate System (I/B/E/S) growth projections for each proxy group company for the short-term growth projection. The Commission uses the growth rate of the Gross Domestic Product (GDP) as its long-term growth rate, since the Commission has found that pipeline specific projections of long-term growth cannot reasonably be developed based on available data sources. The Commission averages these growth projections, giving two-thirds weight to the short-term growth projection and one-third weight to the long-term growth projection.[3]

In formulating the DCF model, the Commission further adds an adjustment to the dividend yield term resulting in the Commission's DCF cost of capital equation. As explained by Commission Staff, the formula is:[4]

$$k = \frac{D_0 \times \left(1 + \frac{1}{2}g\right)}{P} + g$$

[3] *Enbridge Pipelines (KPC)*, 100 FERC ¶ 61,260 at PP 214-215 (2002) ("*Enbridge*").

[4] *Seaway Crude Pipeline Co.*, 154 FERC ¶ 61,070 at P 198 (2016) ("*Seaway*").

Q. How is the dividend yield determined?

A. The Commission has established a very specific procedure for calculating the dividend yield to use in the DCF formula. Specifically, the "current" dividend yield is to be computed using the prior six months of dividend and price data. One first records the highest and lowest trading price during the month for each of the prior six months. The current dividend for each quarter is annualized (*i.e.*, multiplied by 4) and then divided by the average of these two prices (the highest and lowest trading price during each month) to produce six monthly dividend yields. Averaging these six dividend yields produces an unadjusted dividend yield for each company as of today. To obtain the dividend yield for the next period, which is what is used in the FERC's DCF model, today's dividend yield (D_0/P) is multiplied by:

$$(1 + \frac{1}{2}g)$$

where g is the company's weighted average growth rate. Thus, the adjusted dividend yield is obtained by growing the dividend by ½ of the growth rate.

Q. Why is only one half of the growth rate used to set the dividend yield in the Commission's traditional DCF methodology?

A. The Commission has chosen this implementation as an adjustment for the timing in how dividends are paid and the fact that they are paid quarterly. I disagree with the use of the 0.5 multiplier for the initial growth rate as a matter of economic principle because it violates the basic assumptions of the DCF model. The DCF model is derived under the assumption that dividends grow at the full growth rate for the period. However, because it is the

Commission's traditional approach to calculating the DCF model, my calculations follow the Commission's precedent and use this version of the dividend yield in the DCF model.

Q. The Commission's methodology, as outlined in the orders referenced, and the *Proxy Group Policy Statement* requires an estimated long-term growth rate for each of the companies. Please explain how this is computed.

A. Although companies can experience very high rates of growth from time to time (*i.e.*, greater than the growth of the economy as a whole), these high rates cannot generally be expected to last indefinitely. Conversely, very low rates of growth in the near term can generally be expected to improve over time. The longest term for which analyst earnings growth forecasts are publicly available are for about five years. This lack of long-range information requires that dividend and earnings growth beyond five years be estimated in some way. A standard assumption often used is that a company will grow at the same rate as the economy in the long term. If it were expected to grow more rapidly, it would become an ever increasing portion of the economy. Similarly, a company expected to grow more slowly than GDP would play a shrinking role in the economy. For purposes of the DCF model, neither outcome seems reasonable.

The Commission's traditional DCF approach prescribes a long-term growth rate equal to the forecast of long-run GDP growth (in nominal terms). Specifically, the overall growth rate in the Commission's DCF model is the weighted-average of the current *IBES* estimate of the company's short-term earnings growth and the GDP growth rate forecast,

with ⅔ weight on the short-term growth forecast and ⅓ weight on the GDP forecast.[5] For MLPs, the *Proxy Group Policy Statement* prescribes the use of ½ of the GDP growth rate forecast instead of the full amount as the long-term growth rate.

1. *IBES* and Value Line Growth Rate Inputs

Q. How do you obtain the *IBES* growth rates?

A. I downloaded them from Thomson ONE—a third-party data platform provided by Thomson Reuters—using the Thomson Reuters Spreadsheet Link ("TRSL") plug-in for Microsoft Excel.

Q. How does Thomson Reuters update *IBES* growth rates over time?

A. Thomson Reuters tracks 3- to 5-year earnings growth rate estimates submitted by equity analysts who cover a specific company, and calculates the consensus earnings per share ("EPS") growth rate estimate as the average of the growth rates reported by the individual analysts. *IBES* communicates with the analysts and assembles their submissions to maintain as up-to-date a value for the consensus growth rate as possible at any point in time.

Q. Is there sometimes a difference between *IBES* growth rates reported by *Yahoo! Finance* and Thomson Reuters?

A. Yes. Although I do not know the reason, growth rate estimates reported by *Yahoo! Finance* may be "stale" in that, if there are no currently available estimates, *Yahoo! Finance* may continue to report an estimate that Thomson Reuters has removed as out of date.

[5] Per the FERC *Proxy Group Policy Statement*, P 6, footnote 7, the GDP forecast is based on the long-term GDP forecasts produced by the Social Security Administration, the Energy Information Administration, and Global Insight.

Q. How have growth rates for the Core and Expanded Sample changed over time?

A. The *IBES* 5-year growth rates forecasts for the companies in both the Core Sample and the Expanded Sample have been highly volatile. There are two primary drivers of the observed volatility. First, there are only a few analysts—often no more than one or two—tracking each sample company. Second, individual analyst's forecasts often appear to be updated only infrequently.[6] When only a few analysts forecast a company's growth rate, even a change in a single analyst's forecast can alter the consensus growth rate estimate substantially. Of the twelve companies included in the Expanded Sample, seven have only one analyst reporting an estimate and three have only two analysts reporting estimates.[7] In each of these instances, the opinion of one analyst is either all or half of the driving force behind the "consensus" growth rates estimate from *IBES*.

Q. In your opinion are the *IBES* growth rate forecasts reliable?

A. Generally, yes. The brokers and equity analysts who contribute estimates to *IBES* are in general knowledgeable about the companies they cover, and their views are visible to and frequently cited by the investment community. Furthermore, *IBES* has a long history of gathering the contributed estimates and a reputation for doing so according to consistent standards. I therefore believe that the EPS growth rate estimates aggregated and reported by *IBES* provide useful information about the market expectation regarding the growth prospects of the sample companies.

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[6] For example, the growth forecasts for Kinder Morgan as reported on April 11, 2019 were made in mid-2018. Source: Thomson Reuters. Additionally, the growth forecasts reported as of June 30th, 2019 for TC Pipelines and Plains All American Pipeline were stale, meaning they were either out of date or withdrawn by the analyst reporting.

[7] *See* Exhibit No. NNG-00077, Table No. BV-5.

However, the *IBES* consensus growth rate forecasts for the companies in the Core and Expanded Samples are determined by averaging estimates from a small and variable group of contributing analysts, so increasing the number of analysts providing forecasts by including estimates from Value Line would reduce some of the volatility, as explained below.

Q. Given your observations about *IBES* growth rate forecasts, do you estimate the ROE using growth rate inputs other than IBES?

A. Yes. In addition to implementing the traditional FERC DCF model using *IBES* growth rates, I also implement the model using a combination of the *IBES* and Value Line growth rates. Specifically, in my analysis using both *IBES* and Value Line growth rates I assign equal weight to each analyst, so that the *IBES* growth rate is weighted by the number of analysts providing an estimate, while Value Line's estimates is treated as one analyst. Thus, the total number of analysts is the number providing an *IBES* estimate plus one.[8] Adding Value Line to the earnings growth forecasts used in the DCF model increases the number of analysts providing growth rates, which is beneficial. It is always preferable to have additional observations (i.e., a consensus), because the broader coverage a company has, the better it reflects equity investors' perspective. Adding analysts is especially important when the number of analysts providing a forecast to *IBES* is low.

[8] According to the Value Line, Inc. 2018 Form 10-K, Value Line's "target audiences within the investment research field are individual investors, colleges, libraries, and investment management professionals. Individuals come to Value Line for complete research in one package. Institutional licensees consist of corporations, financial professionals, colleges, and municipal libraries. Libraries and universities offer [Value Line]'s detailed research to their patrons and students. Investment management professionals use the research and historical information in their day-to-day businesses."

Value Line is a respected source of financial data and the Commission's approaches in the NETO Briefing Order[9] relied on Value Line for inputs to both the Capital Asset Pricing Model ("CAPM") and the Expected Earnings model.

Additionally, the Value Line analysts update their reports on a strict 13-week schedule so the forecast will never be older than 13 weeks. The reliability of Value Line's quarterly review schedule is a key benefit of using Value Line EPS growth forecasts alongside the *IBES* estimates, given that (as mentioned above) the Thomson Reuters *IBES* consensus growth rates can include estimates that may not have been updated for 6 months or more. Therefore, I recommend that Value Line be used as a source for growth rate information along with *IBES*.

B. Alternative Methods from the Commission's NETO Briefing Order

Q. Please describe the FERC's revised ROE estimation methodology.

A. On October 16, 2018, the Commission issued the NETO Briefing Order on the ROE to be used by New England electric utilities for setting transmission rates. The Commission proposes to expand the methodological basis for calculating ROEs for electric utilities to encompass four analyses:

- Capital Asset Pricing Model ("CAPM")
- Expected Earnings Method
- Risk Premium Method[10]

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[9] *Coakley Mass. Attorney General v. Bangor Hydro-Elec. Co., order on remand*, 165 FERC ¶ 61,030 (2018) ("NETO Briefing Order").

[10] The Risk Premium Method is used to determine the median ROE but not to determine the zone of reasonableness.

- Two-step DCF – same as the Commission's traditional DCF method.

After excluding low- and high-end outliers from each model's results, the methodology establishes a "composite zone of reasonableness."[11] The NETO Briefing Order indicates that outliers are identified based on a minimum spread of 100 basis points ("bps") between the ROE estimate and the yield on BBB-rated utility debt ("low-end") and based on a maximum of a 1.5 multiple of the median estimate ("high-end").

For setting the new ROE (*i.e.*, if an existing ROE is determined to be no longer just and reasonable), the Commission's NETO Briefing Order proposed methodology uses the average of the midpoints or the medians of the three models along with a single point estimate from a proposed fourth methodology, the Risk Premium.[12] For my purposes in this testimony, I have not directly computed or relied on an average of medians – rather I consider the results of the CAPM and Expected Earnings methods (which I calculate) to inform my judgment regarding the reasonableness of the range and median of results from the Commission's traditional DCF model. The Risk Premium Method (calculated by Northern Witness Jay Nigh) is also consistent with the estimates I calculate. Since I discussed the DCF model in detail above, I shall restrict attention below to the CAPM and Expected Earnings models.[13]

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[11] NETO Briefing Order at P 16.

[12] The NETO Briefing Order states that "[t]he Commission will continue to use the midpoint of the zone of reasonableness as the appropriate measure of central tendency for a diverse group of average risk utilities and the median as the measure of central tendency for a single utility." NETO Briefing Order at n.46.

[13] I note that I have been asked by Northern to implement the CAPM and Expected Earnings models in a manner that is as consistent as possible with the implementations discussed and relied on in the NETO Briefing Order. Thus, while I may implement the models differently in other proceedings or regulatory context, my goal here is to implement as closely as possible the models proposed by the Commission's NETO Briefing Order.

Additionally, I note that the implementation of the Risk Premium model proposed and relied on in the NETO Briefing Order is based on a statistical analysis of the historical relationship between allowed ROEs approved for FERC-regulated electric transmission utilities and contemporaneously prevailing government and corporate bond yields. Given the small number of available data points, it is not feasible to analyze how approved natural gas pipeline ROEs move relative to contemporaneous bond yields over time, and the results of any such analysis would not be statistically reliable or meaningful in the context envisioned by the NETO Briefing Order.[14] Northern Witness Jay Nigh therefore proposes an alternative Risk Premium Method approach that is described in his testimony.[15]

1. The Capital Asset Pricing Model

Q. Can you explain the CAPM?

A. Yes. Modern models of capital market equilibrium express the cost of equity as the sum of a risk-free rate and a market risk premium. The CAPM is a long-standing and widely used version of these models. The model requires the specification of: (i) the values of the benchmarks that determine the overall market risk (e.g., the risk-free rate and the market risk premium) and (ii) the relative risk of a security or investment (*i.e.*, beta); and (iii) how the benchmarks combine to produce the estimated ROE. Given these specifications, the company's cost of capital is a function of the company's relative risk. More precisely, the CAPM calculates the cost of capital for an investment, (*e.g.*, a particular common stock) as follows:

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[14] While I am aware that gas pipeline rate case settlements occasionally mention a notional ROE as part of the overall ROE (usually "black box"), even such instances are not common enough to establish a robust statistical relationship.

[15] *See* Exhibit No. NNG-00016.

$$r_s = r_f + \beta_s \times MRP$$

Where r_s is the cost of capital for investment S;

r_f is the risk-free interest rate;

β_s is the beta risk measure for the investment S; and

MRP is the market risk premium.

The CAPM relies on the empirical fact that investors price risky securities to offer a higher expected rate of return than safe securities. The higher the systematic risk, the greater is the expected return. Thus, the CAPM states that the expected ROE starts at the risk-free interest rate (that is the return on a zero-risk security, which equals the risk-free rate). Further, the risk premium of a security over the risk-free rate equals the product of the beta of that security and the risk premium on a value-weighted portfolio of all investments, which by definition has average risk.

a. The Risk-free Interest Rate

Q. What interest rates do your calculations require?

A. The Commission's methodology relies upon the version of the model that is based upon the long-term risk-free rate.

Q. What interest rate do you use in your implementation of the CAPM?

A. The interest rate used in the CAPM must be consistent with the market risk premium selected. If the market risk premium is measured relative to 30-year U.S. Treasury bonds, then the risk-free rate should be for a 30-year U.S. Treasury bonds. Though I generally believe a forecasted risk-free rate to be preferable, I use the historical yield to be consistent

with the NETO Briefing Order. Using the most recent 6-months ending June 30, 2019, I rely on a risk-free rate of 2.89 percent.[16]

b. The Market Risk Premium

Q. How was the Market Risk Premium estimated in the NETO Briefing Order?

A. The NETO Briefing Order relied upon a methodology proposed by Dr. Avera, the NETO witness in that proceeding. Dr. Avera estimated the market risk premium by implementing a single stage DCF model for the dividend paying companies in the S&P 500 index using *IBES* earnings growth rate estimates. Dr. Avera then calculated the expected market return by calculating a market-value weighted-average of the individual company DCF estimates. To derive the market risk premium, Dr. Avera subtracted the 6-month average yield on 30-year Treasury bonds (the risk free rate).

Q. What Market Risk Premium did you estimate?

A. Using the methodology above, I estimate the market risk premium to be 9.50 percent as of June 30, 2019. Details of this calculation are contained in my work papers to Exhibit No. NNG-00077.

c. Beta

Q. What beta estimates were used in the NETO Briefing Order?

A. The NETO Briefing Order uses beta estimates for the sample companies from Value Line. I similarly use Value Line as the source of my beta estimates.

[16] *See* Exhibit No. NNG-00077, Table No. BV-8.

Q. Can you more fully explain beta?

A. The basic idea behind beta is that risks that cannot be diversified away in large portfolios matter more than those that can be eliminated by diversification. Beta is a measure of the risks that cannot be eliminated by diversification. That is, it measures the "systematic" risk of a stock---the extent to which a stock's value fluctuates more or less than average when the market fluctuates.

Diversification is a vital concept in the study of risk and return. (Harry Markowitz won a Nobel Prize for work showing just how important it was.[17]) Over the long run, the rate of return on the stock market (*e.g.*, the S&P 500) has a very high standard deviation of approximately 20 percent per year. Many individual stocks have much higher standard deviations than the market as a whole. Diversification reduces overall portfolio risk. Single-factor equity risk premium models (such as the CAPM) are based upon the assumption that a diversified portfolio mitigates non-systematic risk. The remaining risk is systematic and non-diversifiable. Systematic risk is measured by "beta". Other models similar to the CAPM incorporate more than one risk measure or factors to derive a return on equity.

Q. What does a particular value of beta signify?

A. By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk: it goes up or down by 10 percent on average when the market goes up or down by 10 percent. Stocks with betas above 1.0 exaggerate the swings in the market: stocks with betas of 2.0 tend to

[17] Professor Markowitz won the Nobel Prize in 1990 for developing "the theory of portfolio choice." *See* Press Release from Royal Swedish Academy of Science, October 16, 1990.

fall 20 percent when the market falls 10 percent, for example. Stocks with betas below 1.0 are less volatile than the market. A stock with a beta of 0.5 will tend to rise 5 percent when the market rises 10 percent.

d. Size Adjustment

Q. What is the size adjustment?

A. The size adjustment is a modification to the CAPM estimates based upon empirical evidence from academic studies documenting a difference between a company's theoretical return as estimated by the CAPM and its realized return. The difference is a function of the size of the entity, where size is measured by its market value capitalization. As discussed in the NETO Briefing Order, the size adjustment applied to the CAPM estimates is reported by Duff & Phelps[18] and varies with decile. The smallest decile of companies requires the largest addition to the expected return estimated to depend solely on beta, while stocks in the largest decile have actually shown an empirical tendency to return *less* than the rate of return predicted by applying the CAPM equation to its beta; hence, companies with very large market capitalizations actually receive a downward adjustment.

2. Expected Earnings Method

Q. How did the NETO Briefing Order implement the expected earnings method?

A. The Expected Earnings method uses the expected or forecast return on book equity as provided by Value Line. The forecast used is the expected ROE three to five years in the future. Because the forecast is assumed to be an ROE based upon the company's book

[18] The NETO Briefing Order relied upon the data from the New England Transmission Owner's expert, Dr. Avera, who relied on Duff & Phelps for this calculation. *See* Duff & Phelps, *2017 Valuation Handbook*, U.S. Guide to Cost of Capital, 7-10 and 7-11.

equity in the last year of the period, an adjustment is needed to convert the forecasted ROE to an ROE over an average book value of equity over the period. This adjustment is accomplished by multiplying the future forecasted ROE by the following adjustment factor, where "change in equity" refers to the forecasted percent change in the book equity balance over the three to five year forecast horizon.

$$\frac{2 \times (1 + \textit{change in equity})}{2 + \textit{change in equity}}$$

Q. Are the Expected Earnings estimates market based?

A. No. They are projections of accounting measures of return. Unlike models that rely on market prices, the Expected Earnings approach directly estimates the expected return on book value equity, which is directly comparable to the way rate of return regulation determines an allowed ROE to be applied to a book value rate base.

III. COST OF EQUITY

Q. Staff Witness Alvarez calculates his proposed cost of equity as of May 31, 2019 (Exhibit No. S-0010 at 2). Indicated Shippers Witness Crowe calculates the cost of equity "as of the second week in June 2019."[19] Michigan Public Service Commission Witness Megginson calculates the cost of equity through the first trading day of June 2019 (June 3).[20] In your opinion, are the time periods relied upon by the other witnesses appropriate to calculate Northern's cost of equity capital in this case?

A. No. It is important to use current data and especially so given the change in Northern's equity capitalization. I therefore find that the cost of equity capital for Northern should be calculated as of June 30, 2019, which is the most recent data as of the end of the test period in this case. I recognize that data through June 30, 2019 was not available when the other witnesses prepared their testimony, but now that the data is available, it should be used.

Q. Have you calculated the appropriate ROE for Northern as of June 30, 2019?

A. Yes. In my view the appropriate allowed ROE for Northern is 14.3 percent as shown on my Exhibit No. NNG-00077, Table BV-3(b).

Q. How did you determine the appropriate ROE for Northern?

A. First, I selected a proxy group of comparable companies that reflect the business risk characteristics of a natural gas pipeline such as Northern at this time. As discussed further below, the proxy group that I use is based on a Core Sample of seven companies, although

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[19] Exhibit No. IS-0001 at 12.

[20] Exhibit No. MPSC-0001 at 14-15.

I also analyzed an Expanded Sample of twelve companies.[21] For each company, I apply the Commission's DCF method, as articulated in *Composition of Proxy Groups for Determining Gas and Oil Pipeline Return on Equity,* 123 FERC ¶ 61,048 (2008) ("*Proxy Group Policy Statement*"). I also consider certain alternative models as proposed and relied on in the Commission's October 2018 NETO Briefing Order.

I then consider the results in the context of Northern's business risk characteristics compared to the sample and in conjunction with my opinion that Northern's actual capital structure with 60.80 percent equity is reasonable and consistent with the financing observed for the sample and other regulated natural gas pipelines. The business risk consideration relies on the business risk testimony and evidence presented in the Answering Testimony of Northern Witness Dr. Paul Carpenter as presented in Exhibit No. NNG-00079. Based on this analysis, I recommend Northern be allowed the opportunity to earn an ROE of 14.3 percent.

Q. Why did you calculate the ROE using methods other than the Commission's traditional DCF method for natural gas pipelines?

A. For two reasons. First, the cost of capital can be estimated in several ways, and I believe it is preferable to use several methods to estimate and confirm the cost of capital. For example, the risk-positioning methods (such as the CAPM) are generally useful, in part because they estimate the cost of equity capital for individual companies relative to the risk-return tradeoff for all investments in the market instead of based only on company-specific

[21] The Core Sample consists of Enable Midstream Partners, Enbridge Inc., EQM Midstream Partners, Kinder Morgan, Inc., TC Pipelines LP, TC Energy Corp., and Williams Cos. The Expanded Sample adds Energy Transfer Partners, Enterprise Products, Magellan Midstream, ONEOK, and Plains All American Pipeline.

parameters as does the DCF model. Second, the Commission has indicated that the considerations that led it to rely on different cost of capital models in the electric context are also potentially relevant in the natural gas pipeline context. For example, in a recent natural gas pipeline rate case, the Commission indicated that "at least some of the concerns expressed in [the NETO Briefing Order] regarding the Commission's historical reliance upon the DCF also appear applicable to natural gas pipelines," and confirmed that the hearing in that case should consider whether it was appropriate to establish the pipeline's cost of capital using the traditional DCF method or alternative methodologies.[22] The FERC in its recent Notice of Inquiry[23] has also requested comments on the methods to be applied for the determination of the cost of capital for natural gas pipelines as well.

I also consider it important to look to growth rates from as many independent analysts as possible – especially when the number of analysts contributing to IBES is low. Therefore, I recommend that growth forecasts from both *IBES* and Value Line be considered with each analyst being weighted equally, so if three analysts contribute to IBES, then the *IBES* growth rate is weighted by ¾ and the Value Line forecast by ¼.

A. Sample Selection and Considerations

Q. Please summarize the samples considered.

A. I selected a group of pipeline companies with substantial FERC-regulated gas pipeline operations ("Core Sample") as well as a broader sample of companies with FERC-regulated pipeline assets and a substantial portion of operations subject to rate regulation ("Expanded

[22] *See Trailblazer Pipeline Company LLC*, 166 FERC ¶ 61,141, at PP 3, 48 (2019).

[23] *See generally Inquiry Regarding the Commission's Policy for Determining Return on Equity*, 166 FERC ¶ 61,207 (2019).

Sample"). In general, I favor companies with regulated activities over those with other business activities because natural gas pipeline transmission generally is a regulated activity. I additionally considered the samples proposed in the Alvarez, Crowe, and Megginson testimonies. The specific companies used in the samples are listed in Figure 1 below.

Figure 1: Summary of Samples Considered

	Villadsen	**Alvarez**	**Crowe**	**Megginson**
	[1]	[2]	[3]	[4]
Enable Midstream Part.	**	**	**	
Enbridge Inc.	**			**
EQM Midstream Part.	**	**	**	
Kinder Morgan Inc.	**	**	**	**
TC PipeLines LP	**	**		
TC Energy Corp.	**		**	**
Williams Cos.	**	**	**	**
Energy Transfer LP	*			
Enterprise Products	*			
Magellan Midstream	*			
ONEOK Inc.	*			
Plains All Amer. Pipe.	*			
National Fuel Gas			**	**
Tallgrass Energy LP			**	**
Dominion Energy			**	
Companies Relied Upon	7	5	8	6

Sources and Notes:
** Denotes company relied upon.
* Denotes company analyzed as check.
[2]: Exhibit No. S-0010, p. 19.
[3]: Exhibit No. IS-0001 p. 3.
[4]: Exhibit No. MPSC-0001 p. 12.

Figure 1 shows that two companies are included by all witnesses: Kinder Morgan and Williams. Additionally, I note that Staff Witness Alvarez uses the same proxy group as my

Core Sample except that he excludes the two Canadian entities: Enbridge and TC Energy Corp. (formerly TransCanada). Further, all but Megginson include Enable and EQM and all but Alvarez include TC Energy. I discuss the characteristics of the additional companies suggested in the Crowe and Megginson Testimony in detail below.

Q. What are the characteristics of the companies listed in Figure 1?

A. Figure 2 below summarizes key characteristics of the sample companies (including the three additional companies suggested by Ms. Crowe or Mr. Megginson).

Figure 2: Summary Characteristics of the Sample Companies

Company		Property, Plant, and Equipment: Regulated Natural Gas Pipeline Operations	Property, Plant, and Equipment: Total Regulated Business Activities	Income / Cash Flow / Revenue: Regulated Natural Gas Pipeline Operations	Income / Cash Flow / Revenue: Total Regulated Business Activities
		[1]	[2]	[3]	[4]
Core Sample					
Enable Midstream Part.	**[a]**	**35%**	**35%**	**31%**	**31%**
Enbridge Inc.	**[b]**	**31%**	**89%**	**19%**	**88%**
EQM Midstream Part.	**[c]**	**27%**	**27%**	**35%**	**35%**
Kinder Morgan Inc.	**[d]**	**70%**	**82%**	**48%**	**74%**
TC PipeLines, LP	**[e]**	**100%**	**100%**	**100%**	**100%**
TC Energy Corp.	**[f]**	**73%**	**91%**	**70%**	**91%**
Williams Cos.	**[g]**	**47%**	**52%**	**39%**	**39%**
Expanded Sample					
Energy Transfer LP	[h]	25%	47%	28%	51%
Enterprise Products	[i]	20%	54%	12%	51%
Magellan Midstream	[j]	0%	52%	0%	57%
ONEOK Inc.	[k]	9%	38%	10%	35%
Plains All American Pipeline, L.P.	[l]	0%	59%	0%	56%
Intervenor Companies					
Dominion Energy, Inc.	[m]	10%	81%	8%	78%
National Fuel Gas Company	[n]	21%	42%	24%	36%
Tallgrass Energy, LP	[o]	20%	64%	18%	86%

Sources and notes:
[a] - [l]: Carpenter Testimony, Exhibit No. NNG-00079.
[m] - [o]: Exhibit No. NNG-00077.
[3] & [4][m]: Calculated using Operating Revenue.
[3] & [4][n]: Calculated using Earnings.
[3] & [4][o]: Calculated using Operating Income.

Q. What conclusions do you draw from the asset and income segmentation of your sample?

A. Based on the results in Figure 2, I find that my Core sample is the best representation for the business risk of Northern. Companies in that sample have at least 30 percent of assets or revenue devoted to natural gas pipeline operations and most have additional regulated operations.

Q. As you note above, the only difference between your proxy group and that of Staff Witness Alvarez, is that you include the two Canadian companies, Enbridge and TC Energy, while Mr. Alvarez excludes them. Why did you include the Canadian companies in the proxy group?

A. In my view, Enbridge and TC Energy should be included in the proxy group because they have comparable risks to Northern. They have substantial pipeline assets with TC Energy devoting more than 70 percent of its assets to natural gas pipeline activities and Enbridge Inc. having 31 percent of assets devoted to natural gas transportation with the majority of other assets and income being regulated. They also both own very large U.S. based pipelines subject to FERC regulation.[24] For example, TC Energy generates more revenue and income from U.S. based natural gas pipelines than from Canadian based natural gas pipelines.[25] Similarly, Enbridge owns in excess of 7,200 miles of FERC regulated natural

[24] For a list of natural gas pipelines owned, see Answering Testimony of Dr. Paul Carpenter, Exhibit No. NNG-00079, Table 5 p. 20.

[25] According to CapitalIQ TC Energy had revenues of CAD $4.0 billion and assets of CAD $18.4 billion from Canadian natural gas pipelines but revenues of CAD $4.5 billion and assets of CAD $44.1 billion from U.S. natural gas pipelines.

gas pipelines.[26] In addition, both Enbridge and TC Energy trade on the New York Stock Exchange ("NYSE") and issue debt in the U.S. Finally, the regulated Canadian pipeline assets are subject to National Energy Board ("NEB") jurisdiction, which like the Commission uses a rate of return / cost of service methodology to regulate pipelines. Like many U.S. pipelines, a number of Canadian pipelines operate under settlement agreements. In other words, the regulatory regime has similar characteristics. I recognize that the Commission has excluded Canadian companies from the natural gas proxy group in the past, but, in my view, the fact that Enbridge and TC Energy are headquartered in Canada should not in itself be a reason to exclude them from the proxy group here.[27]

Q. What would happen if you dropped Enbridge and TC Energy from your proposed proxy group?

A. If I were to leave Enbridge and TC Energy out of the proxy group (*i.e.*, use the same proxy group as Staff Witness Alvarez), the estimates from my DCF method would increase from 14.3 percent to 14.6 percent. Leaving the two companies in the proxy group is therefore conservative.

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[26] See Enbridge 2018 10k filing, pp. 19-20. According to CapitalIQ, Enbridge had revenues of CAD $19 billion and assets of CAD $45 billion from Canadian operations but revenues of CAD $ 27 billion and assets of 49 billion in U.S. operations. Enbridge does not appear to report this distribution specifically for its natural gas transmission segment; however, the overall values indicate significant operations in the U.S. nonetheless.

[27] Staff Witness Alvarez also excluded Enbridge because of the acquisition of Spectra Energy Partners, L.P., Enbridge Energy Partners, L.P., and Enbridge Energy Management that was completed on December 20, 2018, which was within six months of [his] May 31, 2019 data period." Exhibit No. S-0010 p. 16. Indicated Shippers Witness Crowe also excluded Enbridge because of this transaction. Exhibit No. IS-0001 p. 9. When updated through June 30, 2019, the transactions are more than six months in the past and there is no reason to exclude Enbridge on this ground.

Q. Do you have any comments on the three additional companies proposed by witnesses Crowe or Megginson?

A. Yes. None of the companies, National Fuel Gas, Dominion and Tallgrass Energy can be characterized as being a natural gas pipeline with an investment grade credit rating, no recent mergers or acquisitions, or other factors that could bias the cost of equity estimation. Simply put, they are not natural gas pipelines with the characteristics desired per the Commission's policy and are not appropriate for inclusion in a natural gas pipeline proxy group.

Q. Please further explain your views regarding National Fuel Gas.

A. National Fuel Gas is pre-dominantly an exploration and production company with risk characteristics that are quite different from those of a natural gas pipeline. For example, Value Line characterize the company as "engaged in the production, gathering, transportation, distribution, and marketing of natural gas & oil." They further note the company has "a large position in the Marcellus Shale basin in western NY & PA and oil reserves in CA."[28] The company's 10-K describes the company as "a diversified energy company engaged principally in the production, gathering, transportation, distribution and marketing of natural gas."[29] National Fuel Gas reports results from five segments of which "Pipelines and Storage" account for 24 percent of reported segment earnings and for 21 percent of property, plant and equipment. From the 10-K it is also evident that capital

[28] Value Line Investment Survey, National Fuel Gas, May 31, 2019.

[29] National Fuel Gas 2018 10-K, p. 5.

expenditures are focused on exploration and production with "Pipelines and Storage" accounting for 15 percent in 2018.[30] Thus, the company is not a natural gas pipeline company and has limited income from regulated assets.

Q. Please further explain your views regarding Dominion Energy.

A. Dominion Energy is primarily an electric company. Moreover, it completed the acquisition of SCANA for $13.4 billion in January 2019, and thus has substantial merger or acquisition activity within the six-month period used to screen companies.[31] For those reasons, Dominion Energy should be excluded from the proxy group.

Ms. Crowe is the only witness to include Dominion Energy in the proxy group. She states that more than 40 percent of Dominion's assets are related to "gas transmission, storage and gathering."[32] But it appears that she included all "Gas Infrastructure" for Dominion as "Gas Transmission, Storage, and Gathering."[33] Looking to Dominion's operations, it is clear that some of these assets pertain to gas LDC operations. For example, Value Line notes that Dominion Energy serves 3.3 million gas customers.[34] My calculations, based on Dominion's 10-K, show that FERC regulated gas transportation and storage only constitute approximately 8 percent of 2018 operating revenues, while transmission property, plant and

30 National Fuel Gas 2018 10-K, p. 49.

31 Dominion 2018 10-K p. 8.

32 I note that the segment "Gas Infrastructure" includes gas transmission and storage, gas distribution and storage, gas gathering and processing, LNG terminalling and storage, and nonregulated retail energy marketing. See Dominion Energy 2018 10-K, p. 186.

33 Crowe Testimony, Exhibit Nos. IS-0003 to IS-0007, Tab Segm. Assets.

34 Value Line Investment Survey, Dominion Energy, May 17, 2019.

equipment (not pertaining to Virginia Power) is approximately 10 percent with storage and gathering accounting for another 4-5 percent.[35]

Moreover, following the combination of Dominion and SCANA, which is less than six months in the past and therefore falls within the relevant M&A exclusion window, Dominion Energy has become even more of an electric company as SCANA as of year-end 2018 reported $16.3 billion in utility assets and no substantial gas pipeline assets.[36] This is important because current stock prices and growth rates for Dominion Energy reflect the combined Dominion/SCANA entity.

Q. Please further explain your views regarding Tallgrass Energy.

A. According to Bloomberg, CapitalIQ, and S&P's online listing, Tallgrass Energy currently has no credit rating from Moody's or Standard & Poor's. However, MPSC Witness Megginson reports that Tallgrass Energy has a non-investment grade rating from both Moody's and Standard & Poor's.[37] Regardless, no credit rating or a non-investment grade rating would exclude Tallgrass Energy from the proxy group. As for Tallgrass Energy's business activities, Tallgrass Energy has substantial unconsolidated equity investments in, for example, Rockies Express. As a result, the amount of assets and capital devoted to natural gas transportation is very different from the property, plant and equipment devoted

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35 Exhibit No. NNG-00077, Table BV-12(a) and (b).

36 SCANA 2018 10-K. Assets are reported in Note 13 (p. 84) and SCANA reported it owned 2 gas pipelines with a total length around 1,100 miles that connects its distribution system with natural gas transportation pipelines (p. 14).

37 Megginson's Response to NNG-MPSC-2.3(a). However, no supporting documents were provided and I cannot find a current rating at Bloomberg, CapIQ, or S&P online.

to natural gas transportation as reported in Figure 2 above.[38] Last, Tallgrass Energy has a somewhat unusual ownership structure in that Value Line reports that "[a]ll directors and officers own 47% of combined Class A (TGE) and Class B shares (not listed and not entitled to distribution from TGE)."[39] Thus, Tallgrass Energy's ownership is unique. Predominantly because Tallgrass Energy has no credit rating or is non-investment grade, I do not consider it an appropriate member of the proxy group.

Q. Indicated Shippers Witness Crowe excluded TC PipeLines from her proposed proxy group.[40] Do you agree with her treatment of TC PipeLines?

A. No. Ms. Crowe acknowledges that TC PipeLines "consists entirely of interstate natural gas transportation pipelines, which would normally qualify it for inclusion in a proxy group for a pipeline like Northern."[41] Nevertheless, she excludes TC PipeLines because (1) it is a master limited partnership, and (2) she contends it would be redundant to include both TC PipeLines and its general partner, TC Energy, in the proxy group.[42] In my view, those reasons do not justify excluding TC PipeLines from the proxy group. First, the Commission's *Proxy Group Policy Statement* explicitly permitted the inclusion of MLPs in

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38 Because Tallgrass Energy does not have an investment grade credit rating, I do not attempt to estimate the assets or income from unconsolidated activities.

39 Value Line Investment Survey, Tallgrass Energy L.P., May 31, 2019.

40 Exhibit No. IS-0001 at 10-11.

41 *Id.*

42 *Id.* Although Michigan Public Service Commission Witness Megginson appears to have based his proxy group on the one proposed by Trailblazer Pipeline in its Section 4 case without any independent analysis, he also suggests that master limited partnerships should not be included in the proxy group. Exhibit No. MPSC-0001 pp. 12-13. I respond to the argument regarding the limited partnerships above. With respect to Mr. Megginson's adoption of the proxy group proposed in the Trailblazer case, I do not agree with simply adopting a proxy group from another case where the time period (and possibly company characteristics) at issue were not the same.

the proxy group for estimating the ROE of Commission-regulated natural gas pipelines.[43] Second, TC PipeLines' income contributes a little over 3 percent to the income of TC Energy.[44] Therefore, the overlap between TC Pipelines and TC Energy is very small and not a reason for elimination.

Q. What conclusions do you draw from the discussion regarding samples?

A. Based on the characteristics of the proposed sample companies, I find that my Core Sample best reflects the business risk of Northern's assets. While I recognize that Staff in the past has rejected Canadian companies, I respectfully submit that both Enbridge and TC Energy own substantial FERC regulated gas pipeline assets and consequently are large operators of natural gas pipelines in the U.S. (subject to FERC jurisdiction). Additionally they are risk comparable to Northern for the reasons discussed above and in the Answering Testimony of Dr. Carpenter.[45] I therefore submit that they are good proxies for a regulated natural gas pipeline company.

B. Results from ROE Estimation Models

1. DCF Results

Q. What are your results from your implementation of the Commission's DCF model?

A. The results are displayed in Figure 3 below.

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[43] *Composition of Proxy Groups for Determining Gas and Oil Pipeline Return on Equity*, 123 FERC ¶ 61,048, at PP 42, 49-51 (2008) ("*Proxy Group Policy Statement*").

[44] TC Energy owns 25.5% of TC Pipelines (TC Energy 2018 Annual Report p. 30). TC Pipelines had earnings of negative $182 million or adjusted earnings of $317 million in 2018 (TC Pipelines 2018 Annual Report, Summary), while TC Energy had earnings of Cnd. $3,539 million (TC Energy Annual Report, p. 22). Using an exchange rate of 0.75, I calculate TC Pipelines contribution to TC Energy's earnings as:

$(25.5\% \times 317) / (3{,}529 \times 0.75) = 3.05\%$.

[45] Answering Testimony of Northern Witness Dr. Paul Carpenter, Exhibit NNG-00079, pp. 18-19.

Figure 3: DCF Results using IBES and Combined Growth Rates

			Company Growth Rates		Cost of Equity Estimates	
Company	Dividend Yield	GDP Growth	IBES Consensus	Weighted Average	IBES Consensus	Weighted Average
	[1]	[2]	[3]	[4]	[5]	[6]
Enable Midstream Part.	**9.0%**	**2.1%**	**3.9%**	**10.6%**	**12.4%**	**17.1%**
Enbridge Inc.	**6.0%**	**4.2%**	**8.2%**	**7.3%**	**13.1%**	**12.5%**
EQM Midstream Part.	**10.3%**	**2.1%**	**2.9%**	**4.6%**	**13.1%**	**14.3%**
Kinder Morgan Inc.	**4.7%**	**4.2%**	**5.3%**	**11.4%**	**9.7%**	**13.9%**
TC PipeLines LP	**7.5%**	**2.1%**	**9.3%**	**9.3%**	**14.6%**	**14.6%**
TC Energy Corp.	**4.9%**	**4.2%**	**4.3%**	**5.2%**	**9.2%**	**9.9%**
Williams Cos.	**5.4%**	**4.2%**	**10.8%**	**13.2%**	**14.3%**	**15.9%**
Energy Transfer LP	8.3%	2.1%	14.8%	12.1%	19.3%	17.4%
Enterprise Products	6.2%	2.1%	9.6%	8.4%	13.5%	12.7%
Magellan Midstream	6.5%	2.1%	1.4%	5.9%	8.2%	11.3%
ONEOK Inc.	5.3%	4.2%	13.8%	13.4%	16.1%	15.9%
Plains All Amer. Pipe.	5.6%	2.1%	6.2%	5.4%	10.6%	10.1%
				Average	12.4%	14.0%
Core Sample				**Median**	**13.1%**	**14.3%**
				Range	9.2% - 14.6%	9.9% - 17.1%
				Average	12.9%	13.8%
Expanded Sample				**Median**	**13.1%**	**14.1%**
				Range	8.2% - 19.3%	9.9% - 17.4%

Sources and Notes:
*Core Sample Companies are displayed in bold.
*Summary values and ranges exclude estimates where:
(a): Estimate is less than the 6-month average BBB rated utility bond yield + 100 bps (as of 6/30/2019 equals 5.54%).
(b): Estimate is greater than the upper end outlier test for its respective sample. (1.5x median estimate of sample)
(c): Company has a negative growth rate.
[1]: 6-month average dividend yield though 6/30/2019.
[2]: Nominal GDP estimate calculated as average of EIA, SSA, and Blue Chip Economic Indicators forecasts. Halved for MLPs per Commission precedent.
[4]: Calculated by giving ValueLine estimate weight of 1 and IBES estimate weight based on the number of analysts estimates included.
[5]: Cost of Equity result of FERC DCF methodology using [3] as the company growth rate.
[6]: Cost of Equity result of FERC DCF methodology using [4] as the company growth rate.

Q. What ROE do you recommend?

A. I recommend using the median of the estimated ROEs from the weighted average of the IBES and Value Line growth rates and therefore recommend an ROE of 14.3 percent.[46] As discussed above, Value Line adds an analyst, which is important given the few analysts that

[46] In Docket No. RP19-1353, my recommendation relied on the median of the *IBES*-based DCF results in order to be conservative. However, for the reasons articulated above, I find that using additional independent analysts is preferable.

follow pipeline companies, (ii) Value Line is a respected source of financial data and the Commission's approaches in the NETO Briefing Order relied on Value Line for input to both the CAPM and Expected Earnings model, and (iii) Value Line updates its growth rates each quarter, whereas there is no specific schedule for updating *IBES* growth rates. I note that the upper end of the Commission's traditional DCF method is above the recommended ROE.

I note that (i) Dr. Carpenter in Exhibit No. NNG-00079 finds that Northern has higher business risk than the median of the Core Sample, which indicates a higher than median ROE and (ii) the inclusion of the two Canadian entities (Enbridge and TC Energy) results in a lower median as the companies' estimated ROE is at or below the median estimate.[47]

I also estimate the DCF-based ROE using the Expanded Sample. These tests result in a range of 9.9 to 17.4 percent with a median of 14.1 using both *IBES* and Value Line growth rates. Hence, the results from the Expanded Sample are comparable to those for the Core Sample. To further examine the reasonableness of the recommendation, I also implement the CAPM and Expected Earnings methodologies used to generate the ROE in the Commission's NETO Briefing Order. I also review the results of Mr. Nigh's Risk Premium Method calculation. The results of my calculations are described below.

[47] If I were to use Staff's Witness Alvarez's sample and exclude Enbridge and TransCanada, the combined growth rate results in a median of 14.6 percent, whereas the IBES only growth rate results in exactly the same median as the larger sample, 13.1 percent.

C. Results from the Alternative Methods

Q. What are the results from CAPM?

A. The results obtained by implementing the CAPM as outlined in the NETO Briefing Order are displayed in Figure 4 below. The results from the implementation of the NETO Briefing Order's CAPM result in ROE estimates that overlap the medians from the DCF model, but mostly point to a higher ROE. The range for the Core Sample is 12.5 to 21.4 percent and the median is 14.3 percent before any size adjustment and 15.2 percent with a size adjustment. Hence, the results are supportive of the combined *IBES* and Value Line result of 14.3 percent.

Figure 4: Results from the CAPM in the NETO Briefing Order

	Unadjusted Cost of Equity Estimate				Size Premium Adjustment		
Company	Risk Free Rate	Market Risk Premium	ValueLine Beta	Unadjusted Cost of Equity	Market Cap ($ millions)	Size Adjustment	**Size Adjusted Cost of Equity**
	[1]	[2]	[3]	[4] = [1] + [2] x [3]	[5]	[6]	[7] = [4] + [6]
Enable Midstream Part.	**2.9%**	**9.5%**	**1.20**	**14.3%**	**$5,852**	**0.9%**	**15.2%**
Enbridge Inc.	**2.9%**	**9.5%**	**1.05**	**12.9%**	**$94,185**	**-0.4%**	**12.5%**
EQM Midstream Part.	**2.9%**	**9.5%**	**1.20**	**14.3%**	**$9,078**	**0.9%**	**15.2%**
Kinder Morgan Inc.	**2.9%**	**9.5%**	**1.45**	**16.7%**	**$46,176**	**-0.4%**	**16.3%**
TC PipeLines LP	**2.9%**	**9.5%**	**1.25**	**14.8%**	**$2,679**	**1.5%**	**16.3%**
TC Energy Corp.	**2.9%**	**9.5%**	**1.10**	**13.3%**	**$45,010**	**-0.4%**	**13.0%**
Williams Cos.	**2.9%**	**9.5%**	**1.95**	**21.4%**	**$34,315**	**-0.4%**	**21.1%**
Energy Transfer LP	2.9%	9.5%	2.15	23.3%	$36,727	-0.4%	23.0%
Enterprise Products	2.9%	9.5%	1.30	15.2%	$62,637	-0.4%	14.9%
Magellan Midstream	2.9%	9.5%	1.15	13.8%	$14,435	0.6%	14.4%
ONEOK Inc.	2.9%	9.5%	1.55	17.6%	$27,820	-0.4%	17.3%
Plains All Amer. Pipe.	2.9%	9.5%	1.50	17.1%	$17,421	0.6%	17.8%
		Average	1.31	15.4%			15.7%
Core Sample		**Median**	**1.20**	**14.3%**			**15.2%**
		Range	1.05 - 1.95	12.9% - 21.4%			12.5% - 21.1%
		Average	1.40	16.2%			16.4%
Expanded Sample		**Median**	**1.28**	**15.0%**			**15.7%**
		Range	1.05 - 2.15	12.9% - 23.3%			12.5% - 23.0%

Sources and Notes:
*Core Sample companies are displayed in bold.
[1]: 6-month average of 30-year U.S. Treasury Constant Maturity Rate series up to 6/30/2019, St. Louis FRED.
[2]: See Workpaper #2 to Table No. BV-8. Also see BV Answering Testimony for desciption of methodology.
[3], [5]: Valueline Investment Analyzer as of 6/27/2019.
[6]: Duff & Phelps 2017 Valuation Handbook - U.S. Guide to Cost of Capital, pp. 7-10, 11.

Q. What are your results from implementing the Expected Earnings model as specified in the NETO Briefing Order?

A. The results are displayed in Figure 5 below.[48] The results from the Expected Earnings model overlap the DCF results and range from 8.6 percent to 16.5 percent with a median of 12.9 percent for the Core Sample, while the results from the Expanded Sample are higher.

Figure 5: Results from the FERC's Expected Earnings Model in the NETO Order

Company	2022-2024 Expected Return on Equity	Adjustment Factor Calculation: 2018 Total Common Equity ($ millions)	Adjustment Factor Calculation: 2022-2024 Expected Total Common Equity ($ millions)	Adjustment Factor Calculation: Change in Equity (%)	Adjustment Factor Calculation: Adjustment Factor	Adjusted Return on Equity
	[1]	[2]	[3]	[4]	[5]	[6] = [1] x [5]
Enable Midstream Part.	**14.0%**	**$7,580**	**$8,000**	**1.1%**	**1.005**	**14.1%**
Enbridge Inc.	**8.5%**	**$69,470**	**$76,620**	**2.0%**	**1.010**	**8.6%**
EQM Midstream Part.	**21.0%**	**$4,813**	**$6,500**	**6.2%**	**1.030**	**21.6%**
Kinder Morgan Inc.	**10.0%**	**$33,678**	**$40,660**	**3.8%**	**1.019**	**10.2%**
TC PipeLines LP	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
TransCanada Corp.	**16.0%**	**$18,604**	**$25,200**	**6.3%**	**1.030**	**16.5%**
Williams Cos	**12.5%**	**$14,660**	**$20,160**	**6.6%**	**1.032**	**12.9%**
Energy Transfer LP	23.1%	$20,559	$23,000	2.3%	1.011	23.3%
Enterprise Products	22.0%	$23,854	$26,000	1.7%	1.009	22.2%
Magellan Midstream	42.0%	$2,643	$3,350	4.9%	1.024	43.0%
ONEOK Inc.	26.5%	$6,580	$8,200	4.5%	1.022	27.1%
Plains All Amer. Pipe.	15.5%	$12,002	$12,865	1.4%	1.007	15.6%
Core Sample					Average	12.4%
					Median	**12.9%**
					Range	8.6% - 16.5%
Expanded Sample					Average	16.1%
					Median	**15.6%**
					Range	8.6% - 23.3%

Sources and Notes:
*Core Sample companies are displayed in bold.
*Summary values and ranges exclude estimates failing the outlier test for each respective sample. (1.5x median estimate of the sample.)
[1] - [3]: Value Line as of 6/30/2019. Enbridge Inc. values reported in millions of Canadian dollars.
[4] = ([3] / [2]) ^ (1/5) - 1
[5] = (2 + 2 x[4]) / (2 + [4])

Q. How do the results in Figure 4 and Figure 5 compare to those from the traditional DCF model?

A. The CAPM results are higher, while the results from the Expected Earnings model are slightly lower for the Core Sample and slightly higher for the Expanded Sample. I view

[48] TC PipeLines does not have forecasted earnings from Value Line, and therefore, I cannot implement the model for that company.

these results as an indication that the results from the DCF model are reasonable in the light of the NETO Briefing Order's methodology. I note that the average of the medians of the three methods (weighted DCF, CAPM and Expected Earnings) for the Core Sample is 14.1 percent, which is comparable to the recommended ROE of 14.3 percent.

Q. How do your calculations compare with the results of Mr. Nigh's Risk Premium calculations?

A. Mr. Nigh's Risk Premium calculation generates a result of 13.97 percent, which is below the 14.3 percent I recommend but comparable and very close to the average of the three methods. Mr. Nigh's Risk Premium for the Expanded Sample is higher at 14.6 percent. Mr. Nigh's calculation of the Risk Premium Method further corroborates the reasonableness of that results from the traditional DCF and my alternative models.

D. Zone of reasonableness

Q. How would you use the cost of equity estimates for the companies in the Core Sample and the Expanded Sample to derive an estimate of the appropriate ROE for Northern?

A. Using the methodology in the NETO Briefing Order, the estimates for the proxy companies are used to establish a range of reasonableness, and the corresponding median is set as the benchmark estimate of the cost of equity for companies of average business risk. The Commission's decision in *Enbridge* provides a summary of this approach:

> Once the rates of return for the proxy companies are determined, thereby establishing a range of reasonable returns, the Commission must determine where to set the pipeline's return in that range based upon how the pipeline's risk compares with that of other pipelines. The Commission begins its risk analysis with the assumption that pipelines generally fall within a broad range of average risk, absent highly unusual circumstances that indicate and [sic] anomalously high or low risk as compared to other pipelines. As a result, the Commission has generally placed pipelines at the middle of the range, using the median of the proxy group returns to calculate the middle.[49]

A. Looking to the Commission's DCF method, the median for the Core Sample is 14.3 percent when both IBES and Value Line growth rates are considered, while the Expanded Sample shows a slightly higher lower at 14.1 percent. These results are higher than those obtained using IBES growth rates only but lower than the CAPM estimates. Looking to the NETO Briefing Order's methodology, the average of the median for the three methods (weighted DCF, CAPM, and Expected Earnings) is 14.1 percent for the Core Sample, while the average using IBES growth rates only along with the CAPM and Expected Earnings is lower at 13.7 percent. The results from the Expanded Sample are higher and therefore supportive of the results.

[49] *Enbridge* at P 216.

Figure 6: Summary of Results

	DCF		CAPM	Expected Earnings
	IBES Growth Rates	Weighted Growth Rates		
	[1]	[2]	[3]	[4]
Core Sample				
Median	**13.1%**	**14.3%**	**15.2%**	**12.9%**
Reasonable Range	9.2% - 14.6%	9.9% - 17.1%	12.5% - 21.1%	8.6% - 16.5%
Expanded Sample				
Median	13.1%	14.1%	15.7%	15.6%
Reasonable Range	8.2% - 19.3%	9.9% - 17.4%	12.5% - 23.0%	8.6% - 23.3%

Sources:
[1]: Exhibit No. NNG-00077, Table No. BV-3(a).
[2]: Exhibit No. NNG-00077, Table No. BV-3(b).
[3]: Exhibit No. NNG-00077, Table No. BV-8.
[4]: Exhibit No. NNG-00077, Table No. BV-9.

Q. What conclusions do you draw from these results?

A. First, based on the analysis. I find that an ROE of 14.3 percent is reasonable. It is derived from the Commission's DCF model using a weighted average of the IBES and Value Line growth rates. It is supported by alternative models and consistent with the upper end of the Commission's traditional DCF using IBES growth rates only.

Further, the evidence of Dr. Carpenter in Exhibit No. NNG-00079 shows that Northern is of slightly higher business risk than the median of the Core Sample, so that the reliance on the median may be conservative.

Viewed in combination with the higher estimates from the CAPM, I find that the 14.3 percent derived from the Commission's DCF model using weighted growth rates from IBES and Value Line is reasonable.

E. Northern's Risk Relative to Proxy Group

Q. Staff Witness Alvarez proposes an ROE for Northern that is below the median of his proxy group, because he claims "Northern has lower than average risk."[50] In your opinion, is it appropriate to reduce Northern's ROE below the median of the proxy group as Mr. Alvarez proposes?

A. No. The Commission's established policy is to use the median ROE of the proxy group based on the "assumption that gas pipelines generally fall into a broad range of average risk."[51] Thus, absent "highly unusual circumstances that indicate anomalously high or low risk as compared to other pipelines," the Commission uses the median ROE.[52] The Commission has explained

> [T]he tools available to the Commission for determining the return on equity to be awarded a particular pipeline are blunt. Therefore, the Commission is skeptical of its ability to make carefully calibrated adjustments within the zone of reasonableness to reflect generally subtle differences in the risk among pipelines. Unless a party makes a very persuasive case in support of the need for an adjustment and the level of the adjustment proposed, the Commission will set the pipelines' return at the median of the range of reasonable returns.[53]

Dr. Carpenter's evidence in Exhibit No. NNG-00079 shows that Northern has higher business risk than the proxy group, while Mr. Alvarez's testimony provides no detailed comparison of the business risk of Northern relative to the proxy group.

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50 Alvarez Testimony, Exhibit No. S-0010, p. 30.

51 *Kern River Gas Transmission Company*, 117 FERC ¶ 61,077 at P 177 (2006).

52 *Id.*

53 *Transcontinental Gas Pipe Line Corp*, 90 FERC ¶ 61,936 (2000)

Q. To your knowledge has the Commission ever established an ROE for a natural gas pipeline below the median of the proxy group?

A. No. I am not aware of the Commission ever having done so. Mr. Alvarez also acknowledges that he is not aware of the Commission ever having established an ROE for a natural gas pipeline below the median of the proxy group.[54]

Q. Given Mr. Alvarez's acknowledgement that the Commission has never used an ROE below the median for a natural gas pipeline, what reasons does he provide to support his downward adjustment?

A. Mr. Alvarez claims that Northern has "low to average financial risk" because of "higher than average investment grade credit ratings," and "lower than average business risk" as a result of "fixed contracts that it can depend on for a steady revenue stream."[55]

Q. In your view, are Mr. Alvarez's arguments accurate and persuasive?

A. No. As shown in the Answering Testimony of Northern Witness Dr. Paul Carpenter, Exhibit No. NNG-00079, Northern has lower contract coverage than my Core Sample and lower contract coverage than majority of the pipelines that are included in Mr. Alvarez's sample.[56] Thus, while Northern has fixed contracts, the pipelines in the proxy group have contracts that cover a larger percentage of the pipelines' capacity. Specifically, Table 6 on p. 27 of Exhibit No NNG-00079 shows that while Northern has 70%, 57% and 43% of its capacity covered by contracts 5, 10 and 25 years out, while the median for the Core Sample

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54 Alvarez Testimony, Exhibit No. S-0010 p. 30.

55 Alvarez Testimony, Exhibit No. S-0010, pp. 29-30.

56 Answering Testimony of Northern Witness Dr. Paul Carpenter, Exhibit No. NNG-00079, pp. 28-29.

is 73%, 61% and 46%, so that regardless of whether I look five years into the future or 25 years into the future, the contract coverage for the Core Sample is higher than for Northern. In addition, as Dr. Carpenter discusses, Northern faces elevated competition in comparison to the median of the pipelines in the Core Sample, has higher capital expenditures and higher storage-related risks.[57] In sum, Northern faces higher business risk than the median of the pipelines in the Core Sample. Therefore, Mr. Alvarez's argument that Northern's contracts reduces its risk are not accurate – the proxy group has better contract coverage.

Q. Please address Mr. Alvarez's arguments regarding Northern's credit rating.

A. Mr. Alvarez argues that Northern has "low to average financial risk" because of its "upper medium quality investment grade" credit ratings.[58] In my view, that does not justify an ROE below the median. Indeed, in arguing that Northern has "low to *average* financial risk," Mr. Alvarez does not allege – let alone demonstrate – that Northern has "anomalously" low risk such as would be required to justify a departure from the median.

Q. What is the relationship between credit ratings and the Cost of Equity?

A. Credit ratings measure the creditworthiness of bonds, notes, and other debt instruments and therefore aimed at creditors (*e.g.*, bondholders) – not equity investors. Moreover, in my view, credit ratings are merely one indication of a company's overall risk profile and should not be relied on exclusively to provide a complete picture of a company's risk. Therefore, there is no one-to-one relationship between credit ratings and the cost of equity. The

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[57] *Id.*

[58] Alvarez Testimony, Exhibit No. S-0010 p. 29.

Commission has recognized that credit ratings, while part of an overall risk analysis are only one factor among many. For example, in *Kern River*, the Commission used an ROE above the median because of the pipeline's overall risk profile. However, the pipeline's credit rating was "somewhat above the average for a natural gas pipeline."[59] Thus, the Commission could not have reached its conclusion on the ROE placement using the credit rating as a primary consideration.

Q Mr. Alvarez refers to the *Portland Natural Gas Transmission* case in which the Commission used an ROE above the median as "the pipeline demonstrated higher than average risk due to a non-investment grade credit rating, combined with an at-risk throughput condition."[60] Mr. Alvarez suggests that this decision supports adjustments above and below the median based on the regulated entity's credit rating.[61] Do you agree?

A. No. In *Portland Natural Gas Transmission*, the entity at issue was found to have a non-investment grade credit rating and an at-risk throughput condition. Thus, the decision pertained to an entity with the combined features of a non-investment credit rating (not a below average credit rating) and an at-risk condition. This scenario is not comparable to the credit metric considerations in this case, where all entities in Mr. Alvarez's proxy group as well as in my Core (and Expanded) Sample are investment grade. Put differently, the Commission's decision was based on the overall risk profile of the pipeline and not simply

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59 *Kern River*, 117 FERC at PP 176-177.

60 Alvarez Testimony, Exhibit No. S-0010 p. 30 (citing *Portland Natural Gas Transmission System*, 142 FERC ¶ 61,197, at P 392 (2013) ("Opinion No. 524")).

61 *Id.*

on a credit metric below average.[62] Specifically, the Commission concluded that an adjustment above the median was warranted because Portland's overall risk "compared to the other proxy group members was *extremely high*."[63] Hence, the circumstances prevailing in *Portland Natural Gas Transmission* system were very different from those in this matter. Instead, Dr. Carpenter has found that Northern has higher risks than the median proxy company.[64]

In this case, Northern has higher business risk than the median proxy company and while its credit rating is above the average of the proxy group, it is not extreme. Notably, the Commission in *Portland Natural Gas Transmission* highlighted the significant difference between an investment grade and a non-investment grade credit rating as a non-investment grade credit rating will "make it more difficult and costly for such a pipeline to attract and obtain capital."[65] By contrast, distinctions among various levels of investment grade credit ratings are generally less significant.[66]

In summary, the circumstances in *Portland Natural Gas Transmission* were very different from those in this instance and therefore cannot be used to determine Northern's placement within the proxy group.

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62 *Portland Natural Gas Transmission System*, 150 FERC ¶61,107 at P 187 (2013) ("Opinion No. 524-A").

63 *Id.* at P 190 (emphasis added).

64 Exhibit No. NNG-00079.

65 Opinion No. 524-A at P 228 (comparing significant increased risks faced by pipelines with a non-investment grade credit rating with the negligible change in risk resulting from a credit downgrade from A+ to A).

66 *Id.*

Q. In discussing Northern's financial risk, Staff Witness Alvarez notes that Northern's credit rating reflects "a low level of long-term debt."[67] In your view, does Northern's capital structure justify an ROE below the median of the proxy group?

A. No. Per Northern's Witness Joseph Lillo, Northern's equity percentage is 60.80% as of June 30, 2019, which is not unusual for the industry. Importantly, a comparison of Northern's capital structure to that used by other natural gas pipelines in their Form No. 501-G filings show a range of 34 percent to 64 percent equity and a median slightly below that of Northern.[68]

Importantly, to assess whether the equity percentage is such that an adjustment to the calculated ROE is merited, it is the market value capital structure that is important.[69]

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67 Alvarez Testimony, Exhibit No. S-0010 p. 29. The Crowe Testimony, Exhibit No. IS-0001 p. 13 also claims that Northern has "relatively low" financial risk because of its capital structure. Ms. Crowe, however, recommends that Northern's ROE be set at the median of the proxy group consistent "with the Commission's presumption that most pipelines fall within a broad range of average risk."

68 Exhibit No. NNG-00077.

69 This is emphasized in, for example, textbooks such as Richard A. Brealey, Stewart C. Myers, and Franklin Allen, 2017, *Principles of Corporate Finance*, 12th edition, McGraw-Hill Irwin, at p. 467 or Stephen A. Ross, Randolph W. Westerfield, and Jeffrey Jaffe, 2002, *Corporate Finance*, 6th Edition, McGraw-Hill Irwin, at p. 386; and Mark Grinblatt and Sheridan Titman, 1998, *Financial Markets and Corporate Strategy*, 1st edition, McGraw-Hill Irwin, at p. 464.

Figure 7: Capital Structure Summary Data

Company		Book Value Equity Ratio (%)	Market Value Equity Ratio (%)
		[1]	[2]
Enable Midstream Part.	**[a]**	**62.6%**	**59.1%**
Enbridge Inc.	**[b]**	**50.4%**	**61.2%**
EQM Midstream Part.	**[c]**	**54.2%**	**69.6%**
Kinder Morgan Inc.	**[d]**	**50.8%**	**57.8%**
TC PipeLines LP	**[e]**	**25.2%**	**57.3%**
TC Energy Corp.	**[f]**	**36.2%**	**54.1%**
Williams Cos	**[g]**	**41.8%**	**61.9%**
Energy Transfer LP	[h]	40.7%	52.8%
Enterprise Products	[i]	48.5%	71.2%
Magellan Midstream	[j]	39.4%	77.3%
ONEOK Inc.	[k]	41.0%	75.3%
Plains All Amer. Pipe.	[l]	51.3%	64.8%
Core Sample			
Average		49.3%	60.1%
Median		**50.6%**	**59.1%**
Range		36.2% - 62.6%	54.1% - 69.6%
Expanded Sample			
Average		47.0%	63.5%
Median		**48.5%**	**61.5%**
Range		36.2% - 62.6%	52.8% - 77.3%
Form 501-G		**2017 Actual**	**Used for 501-G**
Average	[m]	63.4%	56.0%
Median	[n]	**62.0%**	**57.0%**
Range	[o]	-6.5% - 100.0%	34.0% - 64.4%

Sources and Notes:
*Core Sample Companies are displayed in bold.
[a] - [l]: Capital IQ. Data accessed 5/13/2019. Preferred Equity allocated evenly between equity and debt portion of capital structure. Market Value of equity as of 3/31/2019.
[1][e]: Excluded from summary statistics.
[m] - [o]: From the reported capital structure in Form 501-G for natural gas pipeline companies with greater than $500 million rate base.

Q. Please explain further your findings with respect to the equity ratios of the proxy companies.

A. The capital structure of the Core and Expanded Samples is reported below on both a book value and a market value basis. The table also summarizes the capital structure used in the

responses of FERC regulated pipelines to the Commission's Form No. 501-G filing requirement, instituted last year in response to changes in law and policy related to income taxes.[70] According to the guidelines for the FERC's Form No. 501-G, natural gas companies must report the common equity consistent with FERC Form No. 2 / 2A and also report whether the figure pertains to the "books and records" of the parent company.[71] As shown, the equity percentage of the Core and Expanded Samples is consistent with the reporting done in the Form No. 501-G natural gas companies' regulatory filing.[72] In sum, Northern's equity percentage is in line with that of the proxy group as well as with that pipelines' 501-G filings. Hence, Northern's capital structure is not unusual.

[70] FERC Form No. 501-G in Docket No. RM18-11-000 is a one-time report on the rate effect of the TCJA. The form required natural gas companies to report data to the FERC regarding their assets, rate base, ROE, capital structure, income taxes and certain regulatory accounts and approaches. *Interstate and Intrastate Natural Gas Pipelines: Rate Changes Relating to Federal Income Tax Rate*, Order No. 849, 164 FERC ¶ 61,031 (2018) ("Order 849").

[71] *Id*. at P 107.

[72] I exclude TC PipeLines from the summary statistics and consideration of representative book value equity ratios of the sample companies due to its anomalously low value reported for 2018, which was influenced by an asset impairment charge of $537 million recorded in Q4 2018. *See* TC PipeLines 2018 10-K, p. 12. I note that while TC PipeLines' market value equity percentage is very close to the median and average for the proxy companies, its reported book value percentage is anomalously low and unrepresentative.

F. Model and Implementation Issues[73]

Q. Mr. Alvarez proposes to "remove any entity from the proxy group whose composite growth rate is equal to, or greater than, 13.3 percent" based on an ISO New England Decision from 2004.[74] Do you agree?

A. No. As an initial matter, Mr. Alvarez does not appear to have excluded any companies because of this issue, and neither my Core Sample nor Mr. Alvarez' proxy group has any company that displays a growth rate above 13.3 percent. In any case, there is no economic basis to mechanically remove observations simply because they are at or above 13.3 percent. I know of no scientific determination of what number is too high and certainly the growth rate of any company or industry depends on the time period at issue as well as macroeconomic factors. Additionally, imposing a screen on growth rates that are "too high" without simultaneously screening for growth rates that are "too low" results in a downward biased estimate. For example, Mr. Alvarez (and I) both include a growth rate as low as 2.95 percent for EQM Midstream Partners. This growth rate is substantially below the industry average and could be argued to be an outlier just as much as a growth rate above 13.3 percent. Thus, I see no reason to put any artificial restrictions on growth rates. Unusual growth rates should be evaluated using company-specific information or statistical evidence; not dismissed out of hand.

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[73] I note that differences in the sources (e.g., Thompson-ONE vs. Yahoo Finance) for data on companies growth rates result in slight differences in relied upon earnings growth. Similarly, I rely on the average growth rate from Energy Information Administration, Social Security Administration and Blue Chip, while Mr. Alvarez uses an average from Energy Information Administration, Social Security Administration and IHS Markit. The difference is not significant, as I find an average GDP growth rate of 4.21 percent (Exhibit No. NNG-00077), while Mr. Alvarez finds an average GDP growth rate of 4.24 percent (Exhibit No. S-0010, p. 26).

[74] Alvarez Testimony, Exhibit No. S-0010 p. 15.

Moreover, the cases Mr. Alvarez cites are from the electric industry, where the Commission commonly relies on outlier screens as there are many more proxy companies.[75] Regardless, I do not know of a natural gas pipeline case, where the Commission has imposed a cap of 13.3 percent on the pipeline companies' growth rate.

Q. Did Ms. Crowe's DCF calculation follow Commission policy?

A. No. Commission policy prescribes that the dividend yield is calculated monthly over six months. The Commission's dividend yield is calculated by dividing the annualized dividend by the average daily high and low for the month. The six months of dividend yields are then averaged. Ms. Crowe calculated the monthly dividend yield for the months of January through May as prescribed, but used the high and low through June 19, 2019 for the month of June. In other words, incomplete data was used to determine June's dividend yield. I realize that data through the end of June was not available at the time of the calculation, but the calculation is nonetheless inconsistent with Commission policy. This is another reason why it is preferable to use the most recent data as of the end of June, 2019. Now that it is available, the entire month should be used and I did so in my analysis.

Q. Did Mr. Megginson's DCF calculation follow Commission policy?

A. No. Mr. Megginson's dividend yield calculation does not conform to Commission policy. As noted above, under the Commission's policy, the dividend yield is calculated by dividing the annualized dividend by the average inter-day high and low prices for each months, then calculating the average using six months. However, Mr. Megginson simply used the

[75] *See* NETO Briefing Order, PP 50-54. For clarity, I do not agree with the screen in the electric utility context either.

June 3, 2019 closing price instead of the inter-day high and low prices for an entire month. . Mr. Megginson's use of a single data point from June produces a result that does not accurately reflect the time period he claims to measure and is inconsistent with Commission policy.

Q. Do you have any comments on Mr. Megginson's sustainable growth model?

A. Yes. First, the sustainable growth model submitted by Mr. Megginson is not part of the Commission's recognized cost of capital models. Second, the sustainable growth model is based on growth from internal sources; specifically (1-payout ratio)×Expected ROE. As such, the model is not suitable for analyzing MLPs (e.g., Tallgrass Energy) as MLPs are designed to pay out most of their earnings and growth through new debt and equity issuances. It is therefore not surprising that the internal growth rate for Tallgrass Energy becomes almost zero even though the projected accounting return is 26 percent.[76] As a result, the sustainable growth DCF is not suitable to analyze Northern's cost of equity.

However, Mr. Megginson does not rely on the sustainable growth model for his recommendation, so I shall not elaborate further on this issue.

Q. Do you agree with Mr. Megginson's implementation of the CAPM?

A. No. Mr. Megginson implements the CAPM using an average of the historical market risk premium and the forecasted risk premium. As such the determination of the market risk premium does not follow the Commission's guidance in the NETO Briefing Order, which relied on a forecasted market risk premium.

[76] Megginson Testimony, work paper labeled 4.xlsx, Tab NNG-DCF-Sustainable-Growth.

This deviation from the Commission's NETO Briefing Order results in a substantial downward bias in the relied upon market risk premium. Specifically, the Megginson Testimony calculates the forward looking market risk premium at 9.80 percent and report a historical market risk premium is 7.07 percent. The average is 8.43 percent, which is what the Megginson Testimony uses to obtain a CAPM result of 13.46 percent.[77] Had Mr. Megginson relied on the forecasted market risk premium, as the Commission did in the NETO Briefing Order, Mr. Megginson would have estimated a CAPM-based median ROE of 15.17 percent,[78] which is very close to my CAPM result of 15.2 percent in Figure 4 above. Thus, when the method from the Commission's NETO Briefing Order is followed, Mr. Megginson and I obtain very similar CAPM results.

IV. CAPITAL STRUCTURE

Q. Mr. Alvarez proposed to use Northern's actual capital structure as of March 31, 2019. He calculates that as including 64.64 percent equity and 35.36 percent debt.[79] Do you agree?

A. I agree that it is reasonable to use Northern's actual capital structure. However, as more data is available, I used the capital structure as of June 30, 2019. According to the testimony of Northern Witness Joseph Lillo, Northern's capital structure as of June 30, 2019 included 60.80 percent equity and 39.20 percent debt.[80]

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77 Megginson Testimony, Exhibit No. MPSC-0001, pp. 20-21 and work paper 5.

78 Calculated by replacing Mr. Megginson's market risk premium of 8.43% with Mr. Megginson's forecasted market risk premium of 9.80%. The risk-free rate and the betas were not modified.

79 Alvarez Testimony, Exhibit No. S-0010, p. 2.

80 Answering Testimony of Northern Witness Joseph Lillo, Exhibit NNG-00022.

Q. Why do you agree that Northern's actual capital structure should be used?

A. The Commission's established precedent is to "use a pipeline's own capital structure for rate making purposes so long as the pipeline (1) issues its own debt; (2) has its own separate bond rating; (3) has an equity ratio that is not excessive in light of the other equity ratios approved by the Commission and in comparison with the equity ratios of the proxy companies."[81] Northern's actual capital structure meets each of these criteria. Northern issues its own debt and has its own separate bond rating.[82] An equity ratio of 60.80 percent is also in line with what the Commission has approved in prior cases. For example, the orders for *Pacific Gas Transmission Company* and *Williams Natural Gas Company* used 68.86 percent and 64.29 percent equity, respectively.[83] None of the other witnesses appear to take issue with using Northern's actual capital structure. The only difference between Staff's proposal and Northern's proposal involves the time period, and Staff presumably used the data it did because the more recent data was not available when its testimony was filed.

Q. Does this conclude your rebuttal testimony?

A. Yes.

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81 Transco, 84 FERC ¶ 61,084 at 61,414.

82 *See* Answering Testimony of Northern Witness Joseph Lillo Testimony, Exhibit No. NNG-00022.

83 *Pacific Gas Transmission Company*, 62 FERC ¶ 61,109 (1993) (finding pipeline's actual equity ratio of 68.86 percent to be "appropriate and "not atypical"). *Williams Natural Gas Co*., 84 FERC ¶61,080 at 61,355-56 (1998) (finding the pipeline's actual equity ratio of 64.29 percent to be "reasonable compared to equity ratios approved in other cases," as opposed to "equity ratios of 90 percent and above" which the Commission previously found "to be atypical").

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Northern Natural Gas Company) **Docket No. RP19-59-000**

AFFIDAVIT OF BENTE VILLADSEN

I, Bente Villadsen, state that the information contained in my Prepared Answering Testimony is true and correct to the best of my knowledge and if asked the questions that appear in the text of this Prepared Answering Testimony, I would give the answers that are also set forth therein, and I adopt this Prepared Answering Testimony as my sworn testimony in this proceeding.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 13th day of August, 2019.

Bente Villadsen