

NORTHERN UTILITIES, INC.

**DIRECT TESTIMONY
OF
JOHN COCHRANE**

EXHIBIT JC-1

New Hampshire Public Utilities Commission

Docket No. DG 21-104

TABLE OF CONTENTS

I.	INTRODUCTION AND BACKGROUND	1
II.	PURPOSE AND OVERVIEW OF TESTIMONY	2
III.	REGULATORY PRINCIPLES.....	5
IV.	PROXY GROUP SELECTION	7
V.	COST OF EQUITY ANALYSIS	9
	A. Constant Growth DCF Method.....	12
	B. Multi-Stage DCF.....	15
	C. Capital Asset Pricing Model	20
	D. Analytical Results and Adjustment for Flotation Costs.....	24
	E. COVID-19 Impacts.....	28
VI.	SMALL SIZE PREMIUM AND ROE RECOMMENDATION	30
	A. Small Size Premium.....	30
	B. Proposed ROE.....	33
VII.	CAPITAL STRUCTURE.....	33
VIII.	COST OF DEBT	34
IX.	CONCLUSIONS AND RECOMMENDATIONS.....	34

ATTACHMENTS

Attachment	Title
JC-1	Resume of John Cochrane
JC-2	Summary of Results
JC-3	Proxy Group Selection
JC-4	Constant Growth DCF Results
JC-5	Multi-Stage DCF Results
JC-6	Proxy Group Betas
JC-7	Expected Market Return Calculation
JC-8	CAPM Results
JC-9	Flotation Costs
JC-10	Small Size Premium
JC-11	Proxy Group Capital Structure

1 **I. INTRODUCTION AND BACKGROUND**

2 **Q. Please state your full name, position, and business address.**

3 A. My name is John Cochrane. I am a Senior Managing Director and head the Boston office
4 of the Power & Utilities practice at FTI Consulting, Inc. (“FTI”). My business address is
5 200 State St, 9th Floor, Boston, Massachusetts.

6 **Q. On whose behalf are you submitting testimony?**

7 A. I am submitting testimony on behalf of Northern Utilities, Inc. d/b/a Unitil (“Northern” or
8 “the Company”).

9 **Q. Please describe your education and professional experience.**

10 A. I have more than 35 years of experience in utility finance. Prior to joining FTI, I held
11 senior executive positions at National Grid plc (“National Grid”), where I was most
12 recently Executive Vice President of Global Mergers & Acquisitions and Business
13 Development. Prior to holding that position, I was Executive Vice President, Chief
14 Financial Officer, and Treasurer for National Grid’s U.S. business. I also serve or have
15 served as a member of the Board of Directors of several utilities and other companies in
16 the energy sector. I hold a Bachelor’s degree in Biology from Harvard University and an
17 MBA from Northeastern University. A copy of my resume is provided as Attachment
18 JC-1.

19 **Q. Please describe FTI’s Power & Utilities practice.**

20 A. FTI is a worldwide consulting firm dedicated to helping organizations manage change,
21 mitigate risk, and resolve disputes. Our Power & Utilities practice brings these services

1 to firms in regulated and competitive energy industries. The services we provide our
2 utility clients include expert testimony, regulatory advice, support for strategic decision-
3 making, and advice regarding investments and capital allocation. Our team is comprised
4 of former utility executives, regulators, investors, and financial analysts that combine for
5 hundreds of years of experience in the regulated energy space.

6 **Q. Have you previously testified before the New Hampshire Public Utilities**
7 **Commission?**

8 A. Yes, I have testified before the New Hampshire Public Utilities Commission
9 (“Commission”) in several proceedings, most recently in Liberty Utilities (EnergyNorth
10 Natural Gas) Corp. d/b/a Liberty Utilities distribution service rate case, Docket No. DG
11 20-105, and Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities
12 distribution service rate case, Docket No. DE 19-064. A list of select testimony is
13 included in Attachment JC-1.

14 **II. PURPOSE AND OVERVIEW OF TESTIMONY**

15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my testimony is to present evidence and provide recommendations
17 regarding the Return on Equity (“ROE”) the Company should be allowed to earn on the
18 equity portion of its rate base as well as recommendations regarding the Company’s
19 capital costs and capital structure.

1 **Q. Please summarize your conclusions regarding the authorized ROE for the**
2 **Company.**

3 A. Based on the analyses that I describe in this testimony, I conclude that the reasonable
4 range within which the Commission should authorize Northern’s ROE is between
5 10.02% and 11.64%.

6 **Q. Please summarize how you reached those conclusions.**

7 A. My recommendations regarding the reasonable range of ROE are based on quantitative
8 and qualitative analyses I undertook utilizing analytical approaches that are widely
9 accepted for estimating a utility’s cost of capital in New Hampshire and elsewhere. I
10 developed analyses using two variants of the Discounted Cash Flow (“DCF”) method, the
11 Constant Growth DCF method and the Multi-Stage DCF method, and I also used the
12 Capital Asset Pricing Model (“CAPM”) to arrive at my preliminary estimate of a
13 reasonable range of ROEs for Northern. I then undertook a quantitative analysis to adjust
14 that range to account for the costs that Northern will incur in the issuance of new capital.
15 Finally, I undertook quantitative and qualitative analyses of the Company’s risk profile,
16 including a small size premium, and the business environment in which it operates. A
17 summary of the results from these analyses is presented in Attachment JC-2.

18 **Q. What Return on Equity is the Company requesting in this case?**

19 A. The Company requests a 10.30% ROE, which falls in the lower-middle end of the
20 reasonable range. The Company’s proposed ROE is discussed further in the testimonies
21 of Robert B. Hevert, Todd Diggins and Andre Francoeur, and Christopher Goulding and
22 Daniel Nawazelski.

Q. What are your recommendations regarding the Company's proposed capital structure and cost of debt?

A. The Company is proposing a capital structure that is comprised of 52.47% common equity and 47.53% long-term debt, details of which are provided in the Testimony of Messrs. Diggins and Francoeur. I find this capital structure is reasonable and consistent with other utility companies in my comparable group. Regarding the cost of debt, the Company proposes to use its actual net cost of debt of 4.93% for long-term debt, which I also find reasonable.

Q. What are your conclusions regarding Northern's total rate of return?

A. I conclude that a total Rate of Return ("ROR") of 7.75% is reasonable, based on an authorized ROE of 10.30%, a long-term debt cost of 4.93%, and a capital structure that includes 52.47% equity.

Table 1. ROR Summary Calculation

Cost of Equity	10.30%	<i>a</i>
Capital structure equity weight	52.47%	<i>b</i>
Cost of long-term debt	4.93%	<i>c</i>
Capital structure long-term debt weight	47.53%	<i>d</i>
Overall rate of return	7.75%	$e = a*b + c*d$

Q. How is the remainder of your testimony organized?

A. The remainder of my testimony is organized as follows:

- Section III describes the key regulatory principles underlying the estimation of the cost of capital for a regulated utility;
- Section IV describes the selection and composition of a proxy group of utility companies I used to conduct the analyses that underlie my testimony;
- Section V details the analyses I undertook to estimate Northern’s cost of equity;
- Section VI describes the risk factors that justify establishing Northern’s ROE in the range of reasonable ROEs;
- Section VII discusses my findings regarding the Company’s proposed capital structure;
- Section VIII discusses my findings regarding the Company’s proposed cost of debt; and
- Section IX summarizes my conclusions and recommendations.

III. REGULATORY PRINCIPLES

Q. Please describe the guiding principles to which you adhere in estimating the ROE for a regulated utility.

A. The United States Supreme Court established the standards for determining the fairness or reasonableness of a utility’s allowed ROE in *Bluefield Water Works and Improvement Co. v. Public Service Commission of Virginia* (“Bluefield”)¹ and *Federal Power Commission v. Hope Natural Gas Co.* (“Hope”).² In those proceedings, the Court established that a regulated utility’s ROE should be sufficient to attract capital and

¹ *Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923).

² *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

1 support the company's credit quality, and that the ROE should be consistent with the
2 returns investors would require in making investments of similar risk.

3 **Q. Did you review any relevant precedents in New Hampshire?**

4 A. Yes, I did. Commission Order No. 24,972 supports the *Hope* and *Bluefield* standards.

5 Specifically, that Order states that the Commission is:

6 [B]ound to set a rate of return that falls within a zone of
7 reasonableness, neither so low to result in a confiscation of
8 company property, nor so high as to result in extortionate
9 charges to customers. A rate falling within the zone should,
10 at a minimum, be sufficient to yield the cost of debt and
11 equity capital necessary to provide the assets required for the
12 discharge of the company's responsibility.³

13 **Q. Please summarize what these standards require.**

14 A. Based on these standards, the return authorized in this proceeding should afford Northern
15 the opportunity to earn a return that is:

- 16 • Adequate to attract capital at reasonable rates, allowing the Company to make the
17 capital investments it requires to provide safe, reliable service;
- 18 • Sufficient to ensure the Company's financial integrity; and
- 19 • Consistent with returns provided by investments in other utilities with comparable
20 risk profiles.

³ Order No. 24,972 at 54 (May 29, 2009) (quoting *Appeal of Conservation Law Foundation*, 127 N.H. 606, 635 (1986)).

1 **IV. PROXY GROUP SELECTION**

2 **Q. Please briefly describe Northern Utilities.**

3 A. Northern provides gas distribution services to approximately 69,000 customers in
4 southeastern New Hampshire and portions of southern and central Maine.⁴ The
5 Company is a subsidiary of Unitil Corporation (“Unitil”) based in Hampton, New
6 Hampshire and is traded on the New York Stock Exchange.

7 **Q. Why is it necessary to use a proxy group to estimate Northern’s ROE?**

8 A. Northern is not a publicly traded company, which makes it impossible to directly observe
9 its cost of equity. Even if it were publicly traded, anomalous or transitory events may
10 mean that its current ROE is not generally reflective of its economic and financial
11 fundamentals or indicative of investor expectations moving forward. For both reasons, it
12 is standard practice to develop a “proxy group” of comparable, publicly traded companies
13 that can be analyzed and from which inferences regarding Northern’s ROE can be drawn.

14 **Q. How did you select the companies in your proxy group?**

15 A. Starting with the list of all companies categorized by Value Line as Gas Utilities, I
16 applied a set of screening guidelines. Specifically, companies were generally included in
17 the proxy group if:

- 18 • They received at least 60% of their operating income or net income from
19 regulated gas operations;

⁴ Approximately 35,000 customers are in New Hampshire and 34,000 are in Maine.

- They had investment-grade issuer ratings from either Standard & Poor’s (“S&P”) or Moody’s;
- They consistently paid quarterly dividends with no cuts over the past four years;
- They were covered by at least two industry analysts;
- They had positive earnings growth estimates from at least two industry analysts;
- They had not been part of a significant transaction within the past six months.

Q. Have similar criteria been used to select proxy group companies in past proceedings before the Commission?

A. Yes, these criteria are similar to those used in past proceedings before the Commission.

Q. Please identify the companies in your proxy group.

A. The proxy group includes the following nine companies:

Table 2. Proxy Group

Company Name	Stock Ticker
Atmos Energy	ATO
Chesapeake Utilities	CPK
NiSource Inc.	NI
New Jersey Resources	NJR
Northwest Natural	NWN
ONE Gas Inc.	OGS
South Jersey Inds.	SJI
Spire Inc.	SR
Southwest Gas	SWX

1 **Q. Is there any company shown in Table 2 that does not meet every aspect of your**
2 **screening guidelines?**

3 A. Yes, Chesapeake is not publicly rated by either Moody's or S&P. However, it has a
4 Value Line Financial Strength rating of A, which is comparable to or higher than the rest
5 of the proxy group companies.

6 **Q. Why is neither Northern nor Unitil included in your proxy group of companies?**

7 A. It is typical to not include the firm (nor its parent company) that is the subject of a rate
8 proceeding in the composition of a proxy group in order to avoid any circularity issues
9 that could bias results. In addition, Northern is not publicly traded nor does it make up
10 the entirety of a publicly traded company. Because the cost of equity is a market-based
11 concept and, therefore, readily observable and accessible data must be used, the proxy
12 group cannot include Northern and instead consists of publicly traded companies that are
13 similar in business and financial risks to Northern.

14 **V. COST OF EQUITY ANALYSIS**

15 **Q. Please explain the relevance of a regulated utility's ROE in the context of setting**
16 **retail gas rates.**

17 A. Utilities are provided the opportunity to earn a reasonable return on the capital
18 investments they make to provide for safe and reliable operation of their natural gas
19 systems. Those returns contribute to the utility's cost of service, which are recovered
20 through rates approved by the Commission. Regulators authorize a ROR that utilities are
21 allowed to earn on their investments based on the weighted average cost of debt and cost

1 of equity for investments made. These authorized returns will reimburse investors for the
2 capital they have provided to the utility.

3 **Q. How is a regulated utility's ROE estimated?**

4 A. While a utility's cost of debt can generally be observed directly from market rates paid
5 for newly issued debt, the cost of equity must be estimated using market-based
6 information. Although methods vary, the generally accepted approach for doing so is to
7 identify a group of utility companies with similar risk and operating profiles as the utility
8 in question, apply various methodologies to determine their ROEs, and compile an
9 estimate of the utility's ROE based on the results of those analyses plus any adjustments
10 that are required to account for the specific operating and financial factors applicable to
11 the utility that is the subject of the analysis.

12 **Q. Which methods did you utilize to estimate Northern's ROE?**

13 A. I utilized three different financial models to analyze the proxy group and estimate the
14 Company's ROE. Those models are the Constant Growth DCF, the Multi-Stage DCF,
15 and the CAPM. I used the results of those models to establish a preliminary range of
16 reasonable ROEs. I then adjusted that range to account for the costs that Northern incurs
17 when issuing new common equity to fund investments in its system.

18 **Q. Why did you use three models to estimate Northern's ROE?**

19 A. It is widely accepted practice in New Hampshire and elsewhere to estimate ROE using
20 multiple models, and then synthesize a recommended range from those results, because
21 any given model will necessarily utilize certain assumptions which, under some

1 conditions, could limit the accuracy of the model. Additionally, since the models rely on
2 different data inputs and assumptions, using more than one model reduces the potential
3 for some anomalous market result or transient market condition to have an undue
4 influence on results.

5 **Q. Has the Commission recognized the use of more than one analytical approach for**
6 **estimating ROE?**

7 A. Yes, it has done so on numerous occasions. In each of the gas and electric rate cases filed
8 before the Commission in the last five years, multiple analytical approaches were used to
9 estimate the filing utility's ROE.

10 **Q. Has the Commission and its Staff commented on the appropriateness of using the**
11 **Constant Growth DCF and Multi-Stage DCF models in previous proceedings?**

12 A. Yes, they have. The Constant Growth DCF model appears to have widespread support
13 from both the Commission and its Staff. Regarding the Multi-Stage DCF model, the
14 Commission indicated in 2004 that: "Staff testimony supports the view that a three-stage
15 version of the DCF represents a valuable refinement to the DCF method of estimating the
16 cost of capital looking forward over the long term. We agree."⁵

17 **Q. Did you use the three-stage version of the DCF in your analysis?**

18 A. Yes, I did.

⁵ *Verizon New Hampshire*, Order No. 24,265 at 65 (Jan. 16, 2004).

A. Constant Growth DCF Method

Q. Please describe the Constant Growth DCF approach.

A. The Constant Growth DCF method of estimating a utility's ROE is based on the theory that a company's stock price represents the Present Value ("PV") of all future dividend payments. Dividend payments are assumed to continue at their current level into perpetuity and stock prices can be observed in the market. The discount rate implied by the dividends and the current stock price is equal to the company's cost of equity. Thus, the theory holds that a company's stock price is equal to the following:

$$P_0 = \frac{D}{ROE - g}$$

where P_0 is the current stock price, D is the current dividend, ROE is equal to the discount rate required to yield the observable stock price given expected dividends, and g is the expected growth rate in dividends. By restating the same equation, ROE can be expressed as:

$$ROE = \frac{D}{P_0} + g$$

Q. Please summarize your approach to estimating ROE using the Constant Growth DCF method.

A. The Constant Growth DCF method relies on the assumption that a company's dividend payments, earnings, and book value will grow at a constant rate, and that its current cost of equity, its dividend payout ratio, the ratio between a company's total dividend payments to its net income, and its Price-Earnings Ratio ("PE Ratio"), which is the ratio

of its stock price to its earnings, will all remain constant. The Constant Growth DCF method also requires a discount rate that is greater than the expected earnings growth rate. Assuming that each of these assumptions hold true, I calculated the ROE for each of the companies in the proxy group using publicly available data for stock prices and analyst estimates of earnings growth. The ROE estimate for Northern is based on the average of the ROE estimates for each proxy group company. Low, Mid, and High estimates are developed based on which growth estimates are used, as I describe in detail below.

Q. Please explain the stock price data you used in your calculations.

A. Rather than relying on a single stock closing price, I averaged the closing stock prices over three periods: 30, 90, and 180 trading days. The periods I used for each calculation are shown below:

Table 3. Stock Price Averaging Periods

Averaging Period	Start Date	End Date
30-day	April 14, 2021	May 25, 2021
90-day	January 15, 2021	May 25, 2021
180-day	September 8, 2020	May 25, 2021

Q. Why is it necessary to use different averaging periods?

A. I used the multiple averaging periods to reduce any bias that could be introduced by anomalous market conditions if the stock price were based on the results of a single trading day.

1 **Q. Did you make any adjustments to the dividend yield?**

2 A. Yes. To account for the fact that dividends are paid on a quarterly basis and may be
3 increased at different times, I have adjusted the dividend yield by one-half of the
4 expected long-term growth rate. This adjustment has been common practice both in New
5 Hampshire and elsewhere. In particular, the Federal Energy Regulatory Commission
6 (“FERC”) has stated:

7 For ratemaking purposes, the Commission rearranges the
8 DCF formula to solve for “k”, the discount rate, which
9 represents the rate of return that investors require to invest
10 in a company’s common stock, and then multiplies the
11 dividend yield by the express $(1 + .5g)$ to account for the fact
12 that dividends are paid on a quarterly basis. Multiplying the
13 dividend yield by $(1 + .5g)$ increases the dividend yield by
14 one half of the growth rate and produces what the
15 Commission refers to as the “adjusted dividend yield.”⁶

16 **Q. Please identify the source of the growth expectations assumptions you used in your**
17 **calculations.**

18 A. For each company in the proxy group, I used the latest earnings growth estimate as
19 reported by Yahoo Finance, Value Line, and Zacks. These sources are widely used in
20 regulatory proceedings in New Hampshire and elsewhere.

21 **Q. Please describe the results of your analysis using the Constant Growth DCF method.**

22 A. Using the stock prices from each of the three averaging periods, I developed three ROE
23 estimates, which vary by the earnings growth estimate on which it relies. My Mid ROE
24 calculation is based on average earnings growth estimates from Yahoo Finance, Value

⁶ Opinion No. 531, 147 FERC ¶ 61,234 at p. 9.

Line, and Zacks. The Low ROE and High ROE calculations use the earnings growth estimates that are the lowest and highest, respectively, of the three sources. My calculations are provided in Attachment JC-2 and the results are shown below:

Table 4. Constant Growth DCF Method Calculation Results

Averaging Period	Low	Mid	High
30-day	7.86%	9.62%	11.70%
90-day	8.07%	9.84%	11.91%
180-day	8.23%	9.99%	12.07%

I have averaged the results for each of the three averaging periods to calculate the Low, Mid, and High Estimates shown below in Table 5.

Table 5. Average Constant Growth DCF Results

Low	Mid	High
8.05%	9.82%	11.89%

B. Multi-Stage DCF

Q. What other types of DCF analysis did you utilize to estimate Northern's ROE?

A. I also utilized a Multi-Stage (three stage) DCF method to estimate the ROE.

Q. Please explain the Multi-Stage DCF.

A. Like the Constant Growth DCF, the analytical basis for the Multi-Stage DCF is the assumption that a utility's stock price is equal to the PV of the cash flows that will be received by the stockholder. The Multi-Stage DCF assumes that those cash flows are received in three different periods. Stage 1 includes cash flows from dividend payments

1 received in years 1 through 5 in the future. Stage 2 includes cash flows from dividend
2 payments received in years 6 through 10. Stage 3 includes cash flows received thereafter.
3 As with my calculations using the Constant Growth DCF method, I estimated Northern's
4 ROE using the stock prices from the three averaging periods (30-day, 90-day, and 180-
5 day) and developed a Low, Mid, and High ROE estimate using each averaging period.
6 As I describe earlier in my testimony, the use of Multi-Stage DCF in addition to other
7 models is standard practice in New Hampshire and elsewhere, and the use of a Multi-
8 Stage DCF that includes three stages has specifically been recommended by the
9 Commission for the estimation of utility ROEs.

10 **Q. How did you estimate the dividend payments in Stage 1?**

11 A. In Stage 1, my estimates of dividend payments are based on the earnings growth
12 estimates from Yahoo Finance, Value Line and Zacks. For the Mid ROE estimate, I used
13 the average of the three sources. For the Low and High ROE estimates, I used the lowest
14 and highest, respectively, of those three estimates.

15 **Q. How did you estimate the dividend payments in Stage 3?**

16 A. Beginning 11 years into the future, I assume that dividend payments will grow at the
17 same rate as the long-term growth of the economy, as measured by U.S. Gross Domestic
18 Product ("GDP"). My estimate of long-term GDP growth is based on historical real GDP
19 growth with an adjustment for expected inflation.

Q. How did you calculate the historical GDP?

A. Using quarterly data from the U.S. Bureau of Economic Analysis as reported by the Federal Reserve Bank of St. Louis, I calculated that over the period 1929 to 2020, the U.S. economy grew in real terms at an average rate of 3.14% per year.

Q. How did you develop your estimate of inflation?

A. I averaged three sources. First, I used the average of the last 180 trading days as of May 25, 2021, of the 10-Year Breakeven Inflation Rate reported by the Federal Reserve Bank of St. Louis. The 10-Year Breakeven Inflation Rate represents a measure of expected inflation implied from 10-Year Treasury Constant Maturity Securities. Second, I used the annual growth rate of the Consumer Price Index (“CPI”) from 2031–2050 for all urban consumers as projected by the Energy Information Administration (“EIA”). Third, I used the annual growth rate of the GDP chain-type price index from 2031–2050 as reported by the EIA. The inflation measures and the average are shown in Table 6 below.

Table 6. Inflation Assumption

10-Year Breakeven Inflation Rate	2.20%
CPI	2.27%
GDP Chain-Type Price Index	<u>2.37%</u>
Average	2.28%

Q. Please summarize your nominal GDP growth estimate.

A. Combining my real GDP growth estimate with my average inflation rate results in a nominal GDP growth estimate of 5.49%.

Q. How did you estimate earnings growth for Stage 2?

A. Earnings growth in Stage 2 is designed to provide for a gradual transition between Stage 1 and Stage 3. In all cases, there are significant differences between the earnings outlook for Stage 1, which is based on the analysts' earnings outlook, and the long-term GDP outlook. Since there is no reason to believe that there will be a step change in company earnings between years 5 and 6 of the forward-looking period, I assumed that the Stage 2 earnings growth rates would provide a "bridge" between Stages 1 and 3 such that a linear transition occurs in the growth rates between years 5 and 11.

An illustrative example is provided below. Here, the company is assumed to have a Stage 1 growth rate of 6.00%. The Stage 3 growth rate is 5.49%.. Growth rates for years 6-10 provide for a linear transition between Stages 1 and 3.

Table 7. Stage 2 Growth Rates Calculation Illustrative Example

A	$b=(g-a)/6+a$	$c=(g-a)/6+b$	$d=(g-a)/6+c$	$e=(g-a)/6+d$	$f=(g-a)/6+e$	g
First Stage (Year 5)	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage (Year 11)
6.00%	5.91%	5.83%	5.74%	5.66%	5.57%	5.49%

Q. Does setting the Stage 3 growth to your GDP outlook into perpetuity imply that an investor holding a company's stock would hold it into perpetuity?

A. No. The PV of the Stage 3 cash flows is equal to the PV of a series of dividend payments based on the Stage 3 earnings growth rate into perpetuity. In other words, the PV of the Stage 3 cash flows is calculated using the Constant Growth DCF method. As I discuss earlier in my testimony, financial theory indicates that the stock price is equal to the

discounted value of the dividend payments. As such, the PV of the Stage 3 cash flows is the same whether the investor sells the stock or holds it into perpetuity.

Q. What are the results of your analysis using the Multi-Stage DCF method?

A. The results of my analysis using the Multi-Stage DCF method are shown in Table 8 and the calculations are provided in Attachment JC-5.

Table 8. Multi-Stage DCF Method Calculation Results

Averaging Period	Low	Mid	High
30-day	8.86%	9.27%	9.83%
90-day	9.09%	9.51%	10.10%
180-day	9.25%	9.69%	10.31%

I have averaged the results for each of the three averaging periods to calculate the Low, Mid, and High estimates shown in Table 9.

Table 9. Multi-Stage DCF Results

Low	Mid	High
9.07%	9.49%	10.08%

Q. What are the results from the Constant Growth and Multi-Stage DCF models?

A. The range of estimates for the Company's ROE, based on the Constant Growth DCF method is 8.05% to 11.89% and the range of estimates for the Company's ROE based on the Multi-Stage DCF method is 9.07% to 10.08%.

C. Capital Asset Pricing Model

Q. Please summarize the CAPM method.

A. CAPM describes the relationship between the price of a security and the return that investors will require to hold it. The analytical basis is that any security is subject to market risk and that investors will require higher returns for holding riskier assets, all else being equal. In the case of a regulated utility stock, the required return is assumed to be equal to the ROE. Analysis of the risk profile and market conditions to which the proxy group is exposed using the CAPM yields an ROE estimate for Northern.

Q. Please provide the analytical form of the CAPM.

A. The CAPM is defined as follows:

$$RR_i = R_f + \beta_i(R_m - R_f)$$

where:

RR_i is the required return of the investment, which is equal to the ROE;

R_f is the risk-free rate;

β_i is the beta coefficient of the investment; and

R_m is the expected return of the securities market as a whole.

Q. Please explain the meaning and significance of the risk-free rate.

A. Investors require compensation for risk and for the time-value of money; the risk-free rate accounts for the latter. The risk-free rate is set at the return that investors could achieve while exposing themselves to zero risk. It is the minimum return any investor will accept since, by definition, taking on more than zero risk will require compensation

beyond this amount. It is typical for the risk-free rate to be estimated using yields on U.S. Treasury bonds.

Q. How did you estimate the risk-free rate?

A. I estimated the risk-free rate by taking the average of the yields on 30-year constant maturity U.S. Treasury securities as reported by the U.S. Department of the Treasury over recent trading periods. Specifically, I averaged the yields on the 30-year treasuries for each of 30, 90, and 180 trading days, with each period ending as of May 25, 2021. The results of that analysis are shown below:

Table 10. Average Yields of 30-Year U.S. Treasuries

Period	Average
30-day Average	2.30%
90-day Average	2.21%
180-day Average	1.91%

Q. Why did you use multiple averaging periods to estimate the treasury yields?

A. I chose to utilize multiple averaging periods to estimate the treasury yield input to my CAPM calculations to reduce the possibility of biasing my results by relying on outcomes from what may be transitory market conditions; and I used the same averaging periods as those I used for stock prices.

Q. Please explain the meaning and significance of the beta coefficient.

A. The beta coefficient is a measure of a security's exposure to systematic, or non-diversifiable, risk. It indicates a stock's riskiness (volatility) compared to that of the market as a whole. If a stock has a beta coefficient of 1.0, it is exactly as risky as the

1 market. A higher coefficient indicates that the stock is riskier than the market and,
2 conversely, a lower coefficient means that the security is less risky than the market.

3 Beta is calculated by analyzing the returns of a security and the returns of the market as a
4 whole over some historical period, and is mathematically defined as:

$$\beta_i = \frac{\text{Covariance}(R_i, R_m)}{\text{Variance}(R_m)}$$

6 where β_i is the beta coefficient of the security, R_i is the return of the security, and R_m is
7 the return of the market as a whole. Calculation of the covariance between R_i and R_m
8 measures the degree to which the returns of the security and market returns move
9 together, while the variance of R_m measures the degree of volatility in the market.

10 **Q. How did you estimate the beta coefficient?**

11 A. The beta coefficient I use in my CAPM analysis is based on the average of the beta
12 coefficients for the companies in my proxy group, which equals 0.88. The proxy group
13 betas which include market information through May 2021 are reported by Value Line.
14 These are shown below in Table 11 and included as Attachment JC-6.

15 **Table 11. Proxy Group Beta Coefficients**

Company	Beta
Atmos Energy	0.80
Chesapeake Utilities	0.80
NiSource Inc.	0.85
New Jersey Resources	1.00
Northwest Natural	0.85
ONE Gas Inc.	0.80
South Jersey Inds.	1.05

Spire Inc.	0.85
Southwest Gas	0.95
Average	0.88

Q. Please explain the meaning and significance of the expected market return.

A. The primary relevance of the expected market return is that it is used to calculate the Market Risk Premium, which is defined by the term $(R_m - R_f)$. This represents the return that investors can expect from the securities market as a whole, above the return that would be provided by a risk-free investment.

Q. How did you calculate the expected market return?

A. I calculated the expected market return by applying the Constant Growth DCF method described earlier in my testimony to the companies in the S&P 500 Index as reported by Value Line. Using this approach, I estimate that the expected market return is 14.02%. My calculations are provided in Attachment JC-7. The expected market risk premiums that result from reducing the expected market return by the risk-free rates I estimated for each of the three trading-day periods of 30, 90, and 180 trading days (the same as for stock prices)⁷ is shown below:

Table 12. Calculation of Market Risk Premium

	30-day Average	90-day Average	180-day Average
Expected Market Return	14.02%	14.02%	14.02%
Risk-Free Rate	<u>2.30%</u>	<u>2.21%</u>	<u>1.91%</u>

⁷ The 90 trading-day average is January 19, 2021 through May 25, 2021 as the stock market was closed on April 2, 2021 for Good Friday but the Treasury rate was published. Similarly, the 180 trading-day average is September 4, 2020 through May 25, 2021 as the Treasury rate was not published on October 12, 2020 (Columbus Day) and November 11, 2020 (Veterans Day) but the stock market was open each of these days.

Market Risk Premium	11.72%	11.81%	12.11%
---------------------	--------	--------	--------

Q. What were the results of your CAPM analysis?

A. Based on the three risk-free rate estimates I developed, as well as the beta, and market risk premium calculations I describe above, the CAPM method indicates that Northern's ROE is between 12.61% and 12.65%, with an average ROE of 12.64% based on the three risk-free rates I used. My calculations are summarized below in Table 13, and are also provided in Attachment JC-8.

Table 13. CAPM Results

		30-day Average	90-day Average	180-day Average
Risk-free rate	<i>a</i>	2.30%	2.21%	1.91%
Beta	<i>b</i>	0.88	0.88	0.88
Expected market return	<i>c</i>	<u>14.02%</u>	<u>14.02%</u>	<u>14.02%</u>
Market risk premium	$d = c - a$	<u>11.72%</u>	<u>11.81%</u>	<u>12.11%</u>
ROE	$e = a + b*d$	12.65%	12.64%	12.61%
Average ROE	<i>Average of e</i>	12.64%		

D. Analytical Results and Adjustment for Flotation Costs

Q. Briefly summarize your results using the two DCF and CAPM methods.

A. As I previously described, using the Constant Growth DCF method, I calculated estimates of Northern's ROE that range from 8.05% to 11.89%. Using the Multi-Stage DCF method, I calculated estimates of ROE that range from 9.07% to 10.08%. Using the CAPM method, I estimate Northern's ROE to be 12.64%.

1 **Q. How have you aggregated the estimates you developed using the three models?**

2 A. I aggregated them using simple averaging. As shown in Table 14 below, I developed
3 preliminary Low, Mid, and High ROE estimates using the three methods by averaging
4 the results of the Constant Growth DCF, the Multi-Stage Growth DCF, and the CAPM.
5 The averages yield a range of preliminary ROE estimates for Northern of 9.92% to
6 11.54%.

7 **Table 14. Aggregation of Preliminary Analytical Results**

	Low	Mid	High
Constant Growth DCF	8.05%	9.82%	11.89%
Multi-Stage DCF	9.07%	9.49%	10.08%
CAPM	<u>12.64%</u>	<u>12.64%</u>	<u>12.64%</u>
Average	9.92%	10.65%	11.54%

8
9 **Q. Have you made any adjustments to your preliminary range?**

10 A. Yes, I have. I have incorporated an adder to account for security flotation costs in my
11 estimate.

12 **Q. What are security flotation costs?**

13 A. Flotation costs are expenses that companies incur when they issue new common stock or
14 other securities. Flotation costs include underwriting, legal expenses, issuance
15 preparation and other expenses.

1 **Q. Should flotation costs be recovered through ROE rather than through operating**
2 **expenses?**

3 A. Yes, they should. A utility's cost to issue new stock is part of its capital rather than
4 operating costs. If a company cannot recover its flotation costs through ROE, its actual
5 ROE will be less than that required by investors to own the stock. This will, in turn,
6 impair the company's ability to attract the capital required to operate a safe and reliable
7 system. This situation could become particularly problematic if other utilities with whom
8 the Company competes to attract capital are allowed recovery of their flotation costs
9 while Northern is not.

10 **Q. Are flotation costs accounted for in the DCF and CAPM models you used to develop**
11 **the preliminary estimates shown in Table 14?**

12 A. No, they are not. The DCF and CAPM models are designed to estimate the returns that
13 an investor would require for holding a stock based on expected dividend payments (in
14 the case of the DCF models) and/or has a certain risk profile (in the case of the CAPM).
15 For purposes of this proceeding, that required return is used as a proxy for the Company's
16 ROE since the authorized return must match investor requirements in order for Northern
17 to attract capital. Because neither the DCF nor the CAPM models are primarily designed
18 to estimate the ROE for a regulated utility, neither take flotation costs into consideration.

19 **Q. How did you estimate Northern's flotation cost adjustment?**

20 A. I estimated Northern's flotation costs by examining the costs of issuing equity incurred
21 by the proxy group companies and Until in their two most recent common equity
22 issuances. After calculating the average flotation costs for the proxy group and Until, I

adjusted the Constant Growth DCF model to incorporate a dividend yield that would allow investors to recover costs associated with the issuance of equity. The resulting dividend yield is calculated by dividing the current dividend yield by one minus the weighted average flotation costs of the proxy group companies. The difference between the resulting ROE from the adjusted Constant Growth DCF and the unadjusted Constant Growth DCF is the flotation cost adjustment. My calculations can be found in Attachment JC-9.

Q. What is your estimate of the appropriate adder to Northern's ROE estimate to cover flotation costs?

A. Using this method, I estimate that the ROE adder required to cover flotation costs is 0.10%.

Q. Please update your preliminary ROE range to account for flotation costs.

A. In Table 15, below, I add the flotation costs to the preliminary ROE estimates I previously described.

Table 15. ROE Range

	Low	Mid	High
Preliminary estimate	9.92%	10.65%	11.54%
Flotation costs	<u>0.10%</u>	<u>0.10%</u>	<u>0.10%</u>
ROE estimate	10.02%	10.75%	11.64%

Based on the information shown in Table 15, I conclude that Northern's authorized ROE should fall within the reasonable range of 10.02% to 11.64%.

1 **E. COVID-19 Impacts**

2 **Q. What is the most apparent impact that the economic fallout from the COVID-19**
3 **pandemic is having on the economy and financial markets?**

4 A. To date, the impact on financial markets from the economic fallout caused by the
5 COVID-19 pandemic is mixed, demonstrating a high degree of volatility and uncertainty.
6 The U.S. economy reached a monthly economic peak in February 2020, but moved into
7 recession in March 2020 as the onset of the COVID-19 pandemic began to take hold.
8 The unemployment rate spiked from 3.5% in February 2020 to just under 15% in April
9 2020. Since that time, the national unemployment rate has continued to decline and
10 while it has not returned to a pre-pandemic level, it has significantly abated and as of
11 May 2021 stands at 5.8%. Financial markets reacted to the economic downturn as
12 interest rates trended downward initially with the 30-year treasury rate declining from
13 around 2.3% at the start of 2020 to around 1.3% in early July 2020, due primarily to the
14 unprecedented efforts of the Federal Reserve to counteract the impact of COVID-19.
15 However, over the past 10 months, the 30-year treasury rate has returned to its pre-
16 pandemic level at just over 2.3% as of May 2021. Stock market volatility increased
17 significantly during this time period, spiking in March 2020 to more than four times the
18 level experienced at the start of 2020. The stock market had not experienced that level of
19 volatility since the Great Recession of 2008-2009. Since that time, stock market
20 volatility has generally declined, yet it is still approximately one-third higher than the
21 level of volatility prior to the onset of COVID-19.⁸ At the same time that stock market

⁸ See for example, CBOE (Chicago Board Options Exchange) S&P 500 3-Month Volatility Index:
<https://fred.stlouisfed.org/series/VXVCLS>

1 volatility spiked in March 2020, both the S&P 500 index and the Dow Jones Industrial
2 Average index reached relative lows (compared to 2016). Since March 2020, the S&P
3 500 and the Dow Jones Industrial Average have been on upward trends doubling in
4 value.^{9,10} The Dow Jones Utility Average index, which captures the stock price
5 performance of major U.S. utility companies, has experienced a similar upward
6 trajectory, but with more moderated growth of approximately 50 percent from March
7 2020 to date.¹¹

8 **Q. How are these economic and financial market impacts affecting the ROE for utility**
9 **companies?**

10 A. The improved economic and financial market conditions are affecting the expected
11 returns of the proxy group as economic activity continues to improve and interest rates
12 return to pre-pandemic levels. As noted by Value Line:

13 A number of stocks in *Value Line's* Natural Gas Utility
14 Industry have strengthened nicely in price since our last
15 report three months ago. It appears these movements are
16 attributable, to a certain extent, to improved earnings as of
17 late, compared to last year's figures. Indeed the economic
18 environment in the United States is brightening, as state and
19 local governments are easing COVID-related restrictions on
20 businesses and individuals due to declining infection rates
21 (reflecting, no doubt, the ongoing administration of
22 vaccines).¹²

⁹ See the S&P 500 Index: <https://fred.stlouisfed.org/series/SP500>

¹⁰ See the DJIA Index: <https://fred.stlouisfed.org/series/DJIA>

¹¹ See the DJIA Index: <https://fred.stlouisfed.org/series/DJUA>

¹² Value Line Investment Survey, "Natural Gas Utility", May 28, 2021.

1 These market dynamics suggest that while we experienced a significant decline in
2 economic activity with the onset of the pandemic, we are much closer to a pre-pandemic
3 economic environment today than we were a year ago. While there is still some
4 uncertainty associated with the coronavirus, there is greater optimism today certainly in
5 comparison to a year ago.

6 **Q. Have you made any adjustments to your results to account for impacts attributable**
7 **to COVID-19?**

8 A. No, I have not made any adjustments to account for these impacts because the economic
9 impact of COVID-19 has now been occurring for over a year and is reflected to that
10 extent in the data used to produce the DCF and CAPM results.

11 **VI. SMALL SIZE PREMIUM AND ROE RECOMMENDATION**

12 **Q. Are there any other factors that could impact your recommendation for Northern's**
13 **ROE?**

14 A. Yes. Northern is considerably smaller than the utilities in the proxy group, a situation
15 that creates risk for the Company's investors for which they will need to be compensated
16 with a higher return.

17 **A. Small Size Premium**

18 **Q. Please explain why smaller utilities are riskier than larger ones.**

19 A. There is a broad body of evidence supporting the existence of a "firm size effect" on
20 firms in general, and utilities in particular, that requires smaller companies to provide

1 higher returns than larger companies in the same industries.¹³ Smaller utilities have
2 smaller customer bases, have fewer financial resources, and are less diversified in terms
3 of customers and geography.¹⁴ These challenges increase the investors' risks of owning
4 securities in small companies which, in turn, require them to pay a higher return in order
5 to attract capital.

6 **Q. How does Northern compare in size to the other utilities in the proxy group?**

7 A. The Company's operations are significantly smaller than those of the proxy group
8 companies. As shown in Attachment JC-10, Northern has less than a quarter (22%) of
9 the customers of the smallest company by customer count in the proxy group, and only
10 2% of the median number of customers. Northern's capitalization is significantly smaller
11 than the other proxy group companies. Attachment JC-10 shows the actual market
12 capitalization for the proxy group companies based on recent data and estimates the
13 implied market capitalization for Northern.

14 **Q. How did you estimate Northern's capitalization?**

15 A. Because the Company is not a standalone publicly-traded entity, I have estimated its
16 market capitalization by applying the median market-to-book ratio of the proxy group
17 companies to Northern's equity of \$229.2 million.¹⁵ The resulting implied market

¹³ Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, 3rd Edition, New Jersey, John Wiley & Sons, 2008 at Chapter 12; Duff & Phelps, *2018 Cost of Capital: Annual US Guidance and Examples*, 2018 at Chapter 4 pp. 1-7; Rolf W. Banz, "The Relationship between Return and Market Value of Common Stocks", *Journal of Financial Economics* (March 1981) at pp. 3-18.

¹⁴ Duff & Phelps, *2018 Cost of Capital: Annual US Guidance and Examples*, 2018 at Chapter 4 p. 2.

¹⁵ Shareholder equity is shown on Schedule RevREQ-6, Column 4, Line 1.

1 capitalization for Northern is approximately \$415 million, or about 11% of the median
2 market capitalization for the proxy group companies.

3 **Q. What did you conclude regarding a small size premium for Northern's ROE?**

4 A. By calculating an implied market capitalization for the Company, I was able to evaluate
5 the impact of Northern's small size on its ROE relative to the proxy group companies. In
6 its Cost of Capital Navigator, Duff & Phelps calculates size premia associated with
7 deciles of market capitalizations, as well as categorizations of Mid Cap, Low Cap, and
8 Micro Cap.¹⁶ As shown in Attachment JC-10, the mean market capitalization of the
9 proxy group companies of \$4.9 billion falls into the fourth decile of market capitalization,
10 corresponding to a size premium of approximately 0.75% and the median market
11 capitalization of \$3.8 billion falls just outside the fifth decile, which would correspond to
12 a size premium of approximately 1.09% if in that decile. Northern's implied market
13 capitalization falls in the ninth decile and Micro Cap category. According to the Duff &
14 Phelps data, Northern merits a size premium of 2.29%, which is 1.54% higher than the
15 size premium for the mean of the proxy group and 1.20% higher than the size premium
16 for the median of the proxy group.

17 **Q. Do you propose to adjust your reasonable range to account for the size premium?**

18 A. No, I do not. Estimating the size premium is a complex analysis that lacks the
19 transparency of the calculations on which I relied for other aspects of my testimony.

¹⁶ Duff & Phelps defines Mid Cap companies as companies with market capitalizations between \$2,996 million and \$13,455.8 million, Low Cap companies as companies with market capitalizations between \$730 million and \$2,992.3 million, and Micro Cap companies as companies with market capitalizations between \$2.5 million and \$727.8 million. Northern falls in the MicroCap category, while the majority of companies in the proxy group tend to fall in the Mid Cap range.

1 While it is clear that Northern is exposed to the small size premium, the magnitude of the
2 impact of this influence is a matter of debate in academic literature and limitations
3 regarding data availability make the estimation less robust. The results of the size
4 premium analysis should be considered as an additional input supporting Northern's
5 proposal that its authorized ROE be set at 10.30% which falls on the middle-lower end of
6 the reasonable range I previously described.

7 **B. Proposed ROE**

8 **Q. What does Northern propose for an authorized ROE?**

9 A. As discussed in more detail in the testimonies of Robert Hevert, Todd Diggins and Andre
10 Francoeur, and Christopher Goulding and Daniel Nawazelski, Northern proposed an
11 authorized ROE of 10.30%.

12 **VII. CAPITAL STRUCTURE**

13 **Q. What is the Company's proposed capital structure?**

14 A. As described in the joint testimony of Todd Diggins and Andre Francoeur, the Company
15 has proposed a capital structure of 52.47% common equity and 47.53% long-term debt.

16 **Q. Have you compared this proposed capital structure to the other companies in the**
17 **proxy group?**

18 A. Yes, I have. I calculated the average capital structure for the proxy group companies
19 over the past five years and compared it to Northern's proposed capital structure. As
20 shown in Attachment JC-11, over this period, the capital structure of the proxy group
21 was, on average, comprised of approximately 53% common equity and 47% long-term

1 debt. Over that same period, the maximum average equity weight for the proxy group
2 companies was approximately 65% while the minimum was approximately 37%.

3 **Q. What is your conclusion regarding the Company's proposed capital structure?**

4 A. I conclude that the Company's proposed capital structure is reasonable.

5 **VIII. COST OF DEBT**

6 **Q. What is the Company's proposed cost of debt?**

7 A. As described by Messrs. Diggins and Francoeur, the Company proposes a cost of long-
8 term debt of 4.93%.

9 **Q. What is your conclusion regarding the Company's proposed cost of debt?**

10 A. As described in the Company's testimony, the proposed cost of debt is based on
11 Northern's actual cost of debt. I conclude that it is reasonable.

12 **IX. CONCLUSIONS AND RECOMMENDATIONS**

13 **Q. Please summarize your conclusions**

14 A. I have four primary conclusions. *First*, I conclude that the Company's ROE should fall
15 between the range of 10.02% and 11.64% including a flotation cost adjustment but not
16 one for its small size relative to the peer group. *Second*, I support Northern's proposed
17 authorized ROE of 10.30%, which is within the reasonable range described in my
18 testimony. *Third*, I conclude that the Company's proposed capital structure is reasonable.
19 *Fourth*, I conclude that the Company's proposed cost of debt is reasonable.

1 **Q. Please summarize your recommendations.**

2 A. I recommend that the Commission accept Northern's proposed authorized ROE of
3 10.30%, that it accept the Company's proposed capital structure and debt costs, and that
4 it authorize a total ROR of 7.75%.

5 **Q. Does this conclude your testimony?**

6 A. Yes.