Exhibit No.: _____
Issues: Return on Equity, Cost of Debt, Capital Structure
Witness: John Cochrane
Type of Exhibit: Direct Testimony
Sponsoring Party: Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty
Case No.: GR-2024-0106
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Before the Public Service Commission of the State of Missouri

Direct Testimony

of

John Cochrane

on behalf of

Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty

February 9, 2024

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FOR THE DIRECT TESTIMONY OF JOHN COCHRANE
LIBERTY UTILITIES (MIDSTATES NATURAL GAS) CORP. D/B/A LIBERTY
BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION
CASE NO. GR-2024-0106

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is John Cochrane. My business address is 200 State St, 9th Floor, Boston, Massachusetts.

Q. By whom are you employed and in what capacity?

A. I am a Senior Managing Director in the Power, Renewables & Utilities practice at FTI Consulting, Inc. ("FTI").

Q. Please describe FTI and its Power, Renewables & Utilities practice.

A. FTI is a worldwide consulting firm dedicated to helping organizations manage change, mitigate risk, and resolve disputes. Our Power, Renewables & Utilities practice brings these services to firms in regulated and competitive energy industries including regulatory services and utility ratemaking, support for strategic decision-making, and advice regarding investments and capital allocation. Our team is comprised of former utility executives, regulators, investment bankers, and financial analysts that combine for hundreds of years of experience in the regulated energy space.

Q. On whose behalf are you testifying in this proceeding?

A. I am testifying on behalf of Liberty Utilities (Midstates Natural Gas) Corp. ("Liberty Midstates" or the "Company").

Q. Please describe your educational and professional background.

A. I have more than 40 years of experience in utility finance. Prior to joining FTI, I held senior executive positions at National Grid plc, where I was most recently Executive

Vice President of Global Mergers & Acquisitions and Business Development. Prior to holding that position, I was Executive Vice President, Chief Financial Officer, and Treasurer for National Grid's U.S. business. In addition to all traditional finance and accounting responsibilities I have overseen regulatory, energy supply and many other functions. I also serve or have served as a member of the Board of Directors of several utilities and other companies in the energy sector. I hold a Bachelor of Arts degree in Biology from Harvard University and an MBA from Northeastern University.

Q. Have you previously testified before the Missouri Public Service Commission (the "Commission") or any other regulatory agency?

A. I submitted rebuttal testimony for The Empire District Electric Company in Commission Case No. ER-2019-0374. In addition, I have testified on behalf of subsidiaries of Liberty Utilities Co. ("LUCo") on a number of occasions in other states. A full list of the proceedings in which I have testified as of the date of my pre-filed testimony is provided in **Direct Schedule JC-1**.

Q. What schedules are you sponsoring?

A. I am sponsoring the following Schedules:

Direct Schedule	Title
JC-1	Resume of John Cochrane
JC-2	Summary of Results
JC-3	Proxy Group Selection Criteria
JC-4	Constant Growth DCF Model
JC-5	Multi-Stage DCF Model

JC-6	Proxy Group Betas
JC-7	Expected Market Return Calculation
JC-8	CAPM Results
JC-9	Authorized Returns for Gas Utilities since 2008
JC-10	Bond Yield Plus Risk Premium Results
JC-11	Flotation Cost Results
JC-12	Small Size Premium
JC-13	Proxy Group Capital Structure
JC-14	Comparison of CWIP to Short-Term Debt
JC-15	Weighted Average Cost of Capital
JC-16	13-Month Average of Capital Structure
JC-17	Weighted Average Cost of Debt
JC-18	Algonquin Power & Utilities Co. Capital Structure
JC-19	Liberty Utilities Co. Capital Structure

II. PURPOSE AND OVERVIEW OF TESTIMONY

Q. What is the purpose of your Direct Testimony?

A. The purpose of my testimony is to provide recommendations regarding (i) the Return on Equity ("ROE") that Liberty Midstates should be authorized to recover through its rates and (ii) the cost of debt and capital structure that should be used for ratemaking purposes.

Q. Please summarize your recommendations.

A. Based on the analyses that I describe in this testimony, I conclude that the reasonable range within which the Commission should authorize Liberty Midstates's ROE is between 10.43% and 11.28%. I also conclude a capital structure of 52.9% common equity and 47.1% long-term debt at a cost of 5.59% is reasonable for this case.

Q. Please summarize how you reached your recommendation regarding ROE.

A. My recommendations regarding the reasonable range of ROE are based on quantitative and qualitative analyses I undertook utilizing analytical approaches that are widely accepted for estimating a utility's cost of capital in Missouri[1] and elsewhere. As detailed below, I used four different methods to develop my recommendation. First, I used Constant Growth and Multi-Stage Discounted Cash Flow ("DCF") methods. Next, I utilized the Capital Asset Pricing Model ("CAPM"). I then used the Bond Yield Plus Risk Premium Model ("RPM"), and I undertook a quantitative analysis to adjust that range to account for the costs that Liberty Midstates would incur in the issuance of new equity capital. Based on the results developed from each, I estimated a reasonable range of ROEs for the Company of 10.43% to 11.28%.

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

A. The Company requests a 10.80% ROE, which is the approximate midpoint of my reasonable range.

[1] Missouri Public Service Commission Order, Spire Missouri Inc., Docket No. GR-2021-0108.

Q. How did you reach your recommendation regarding capital structure and long-term debt cost?

A. An adjusted capital structure of 52.9% common equity and 47.1% long-term debt at December 31, 2023 is below the December 31, 2022 historical levels of 56.0% common equity, 24% long-term debt and 20% net short-term/money pool debt and the thirteen month average of 61% common equity, 26% long-term debt and 13% short-term debt/money pool.[2,3] My recommended capital structure reflects issuance of $90.6 million of new long-term debt approved by the Commission's Order in Docket Number GF-2023-0280 effective August 5, 2023, which was used to pay down existing money pool balances, refinance matured long-term debt and fund capital expenditures. After approval was received from the Illinois Commerce Commission Order No. 23-0585 effective December 14, 2023, the Company issued two 10-year intercompany notes to LUCo at a market rate of 5.774%. I will further elaborate on the appropriateness of my recommended capital structure later in my testimony. My recommended long-term debt cost of 5.59% is based on the sum of the Company's actual effective costs for existing long-term debt on the Company's books at December 31, 2022, the retirement of the $25.6 million note in May 2023, and the actual cost of the new $90.6 million of long-term debt (two intercompany notes). **Direct Schedules JC-15 and 16** provide support for my recommendations for the test year capital structure and **Direct Schedule JC-17** for the cost of long-term debt.

[2] The Company has no short-term debt outstanding. The Company meets short-term borrowing needs through its participation in the Liberty Utilities intercompany money pool, which was approved by the Commission in File No. AO-2018-0179 with an effective date of September 14, 2019. The money pool balance is based on a 13-month average ended December 31, 2022, and is reduced by construction work in progress and deferred gas costs primarily related to Storm Uri measured over the same 13-month period (see **Direct Schedule JC-16**).
[3] Commission Order in GR-2021-0108.

Q. What would be the Company's authorized Rate of Return if your recommendations are accepted?

A. If my recommendations are accepted, the Company's authorized rate of return would be 8.35%, based on the end of the test year at December 31, 2022.

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 the proxy group I used to conduct the analyses that underlies my testimony;
- Section V details the analyses I undertook to estimate Liberty Midstates's cost of common equity;
- Section VI discusses my findings regarding the Company's proposed debt and equity capital structure components;
- Section VII discusses my findings regarding the Company's proposed cost of debt; and
- Section VIII summarizes my conclusions and recommendations.

III. <u>REGULATORY PRINCIPLES</u>

Q. Please describe the guiding principles relevant to determining an appropriate ROE authorization for a regulated utility.

A. The United States Supreme Court established standards for determining the reasonableness of a utility's allowed ROE in *Bluefield Water Works and Improvement Co. v. Public Service Commission of Virginia ("Bluefield")* and *Federal Power*

Commission v. Hope Natural Gas Co ("Hope").[4] In those proceedings, the Court established that a regulated utility's ROE should be sufficient to attract capital and support the company's credit quality and that the ROE should be consistent with returns investors would require in making investments of similar risk.

Q. How are the Hope and Bluefield standards relevant to this proceeding?

A. The Company, like any utility, must be able to attract capital at competitive rates in order to maintain a safe and reliable system for service to its customers. To do so, it must be able to offer investors returns that are commensurate with those available from other investments whose level of risk is similar. ROE, therefore, is an important part of this proceeding, wherein the Commission will authorize an ROE high enough to allow the Company to compete for capital, which will, in turn, serve as an important determinant of the Company's revenue requirement, from which its retail rates are calculated.

Q. Are the methods you used consistent with the Commission's guidance and with approaches used in other, recent proceedings?

A. Yes.

IV. PROXY GROUP SELECTION

Q. Please briefly describe Liberty Midstates.

A. Liberty Midstates provides natural gas to communities in Missouri, Illinois and Iowa. The Company services approximately 52,615[5] retail customers throughout Missouri.

[4] Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia, 262 U.S. 679 (1923); Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944).
[5] As of December 31, 2022.

The Company is a subsidiary of LUCo, which is the parent company for all regulated utility investments for Algonquin Power & Utilities Corp., LUCo's parent company.

Q. Why is the use of proxy companies necessary?

A. The Company's cost of equity cannot be directly observed because it is not a publicly traded entity. It is therefore necessary to compile a proxy group of comparable, publicly traded firms whose finances can be analyzed and from which inferences about the Company's ROE can be drawn.

Q. How did you select the companies for analysis?

A. I have developed a proxy group I believe is representative of the risks of Liberty Midstates. To do so, I compiled a list of the twelve gas utility companies for which financial information is tracked and reported by Value Line, Inc. ("Value Line"), a financial research firm whose data has been used for this purpose on numerous occasions before the Commission and in other jurisdictions. Of these, I eliminated five from further consideration based on a set of screening criteria which are intended to identify companies whose financial position or lack of data make them inappropriate proxies for the Company.

Q. What screening criteria did you use?

A. Companies were included if all of the following criteria were true:

- They received at least 60% of their operating income or net income from regulated gas utility operations;
- They had investment-grade issuer ratings from either Standard & Poor's ("S&P") or Moody's;
- They paid dividends, with no cuts, in every quarter since 2019;

- They were covered by an analyst from at least two of the following sources: Value Line, Zack's, or Yahoo Finance;
- They had positive earnings growth estimates from at least two of the following sources: Value Line, Zack's, or Yahoo Finance; and
- 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, the criteria I used to select proxy group companies are similar to those used in recent proceedings before the Commission related to utility ROE.[6]

Q. Did you deviate from your screening criteria set forth above?

A. Yes, in one instance I felt it was beneficial to deviate from the stated criteria. Although Chesapeake Utilities ("Chesapeake") is not rated by either Moody's or S&P, Value Line lists Chesapeake as having an "A" rating for Financial Strength, Value Line's highest rating, indicating Chesapeake's strong ability to generate net income and cash flow. Because this suggests that Chesapeake's finances are at least as strong as the other companies that passed the screening, and because it passed every other criteria, I included it in the analysis. In total, my proxy group of gas companies consists of seven companies.

Q. Please list the companies in your proxy group.

A. Each of the companies shown in Table 1 below are members of my proxy group:

[6] Missouri Public Service Commission Order, Spire Missouri Inc., Docket No. GR-2021-0108.

Table 1: Proxy Group Companies

Company Name	Stock Ticker
Atmos Energy	ATO
Chesapeake Utilities	CPK
NiSource Inc.	NI
Northwest Natural	NWN
ONE Gas Inc.	OGS
Spire Inc.	SR
Southwest Gas	SWX

V. COST OF EQUITY ANALYSIS

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

A. Utilities are allowed to earn a return on the capital investments they make to provide for safe and reliable operation of their gas distribution systems. Those returns contribute to the utility's cost of service, which are recovered through rates approved by the Commission. Regulators authorize the rate of return that utilities are allowed to earn on their investments based on the weighted average cost of debt and cost of equity for investments made, which permits the utility to continue to attract the capital required to provide safe and reliable utility service.

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

A. While a utility's cost of debt can generally be observed directly from market rates paid for newly issued debt, the cost of equity must be estimated using market-based information. For reasons I describe above, the generally accepted approach to doing so – and the one that the Commission has indicated as being appropriate – is to select a proxy group of utility companies with similar risk and operating profiles and use their financial information to develop the estimate.

Q. Which methods did you utilize to estimate Liberty Midstates' ROE?

A. I utilized four different methods to analyze the proxy group and estimate the Company's ROE: the Constant Growth DCF, the Multi-Stage DCF, the CAPM, and the RPM. I used the results from each to establish a preliminary range of reasonable ROEs. I then adjusted that range to account for the costs that Liberty Midstates incurs when issuing new common equity to fund investments in its system.

Q. Does the use of multiple methods afford any additional benefits?

A. Yes, using multiple methods is beneficial. Since the models rely on different data inputs and assumptions using more than one model reduces the potential for some anomalous market result or transient market condition to have an undue influence of results.

a. <u>Constant Growth DCF Model</u>

Q. Please describe the Constant 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 in 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 Liberty Midstates 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 days. The periods I used for each calculation are shown in Table 2 below:

Table 2: Stock Price Averaging Periods

Averaging Period	Start Date	End Date
30-day	December 12, 2023	January 11, 2024
90-day	October 13, 2023	January 11, 2024
180-day	July 15, 2023	January 11, 2024

Q. Why did you use different averaging periods?

A. I used different 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 day. Utility stock prices move inversely to interest rates based on the high percentage of net income they payout as dividends. Interest rates move up and down daily based on numerous factors. In addition, major domestic and international events occur frequently which also adds to stock market volatility. These factors and others create the anomalous conditions that require longer and different averaging periods.

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

A. Yes, I made adjustments to the dividend yield to account for the fact that dividends are paid on a quarterly basis and may be increased at different times, I have adjusted the dividend yield by one-half of the expected long-term growth rate. This adjustment has been common practice in many jurisdictions. For example, the Federal Energy Regulatory Commission has observed:

> For ratemaking purposes, the Commission rearranges the DCF formula to solve for "k", the discount rate, which represents the rate of return that investors require to invest in a company's common stock, and then multiplies the dividend yield by the express (1 + .5g) to account for the fact that dividends are paid on a quarterly basis. Multiplying the dividend yield by (1 + .5g) increases the dividend

yield by one half of the growth rate and produces what the Commission refers to as the "adjusted dividend yield."[7]

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

A. For each company in the proxy group, I used the latest earnings growth estimates as reported by Value Line, Zacks, and Yahoo Finance. Each of these sources are widely used for this purpose in regulatory proceedings before the Commission[8] and in other jurisdictions.

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

A. Using the stock prices from each of the three averaging periods, I developed three ROE estimates, which vary by the earnings growth estimate on which it relies. My Mid ROE calculation is based on average earnings growth estimates from Value Line, Zacks, and Yahoo Finance. 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 **Direct Schedule JC-4** and the results are shown below in Table 3 below and in my Summary of Results **Direct Schedule JC-2**:

Table 3: Constant Growth DCF Method Calculations Results

Averaging Period	Low	Mid	High
30-day	9.28%	10.35%	11.82%
90-day	9.35%	10.42%	11.89%
180-day	9.20%	10.26%	11.73%
Average Results	**9.28%**	**10.34%**	**11.81%**

[7] Opinion No. 531, 147 FERC ¶ 61,234 at p. 9.
[8] Missouri Public Service Commission Order, Spire Missouri Inc., Docket No. GR-2021-0108.

Q. What are your results from the Constant Growth DCF model?

A. My Constant Growth DCF method calculations for the proxy group resulted in an estimated range for the Company's ROE of 9.28% to 11.81%.

b. Multi-Stage DCF Model

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

A. I also utilized a Multi-Stage (three stage) DCF method to estimate Liberty Midstates's 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 received in years 1 through 5 in the future. Stage 2 includes cash flows from dividend payments received in years 6 through 10. Stage 3 includes cash flows received thereafter. As with my calculations using the Constant Growth DCF method, I estimated Liberty Midstates's ROE using the stock prices from the three averaging periods (30-, 90- and 180-day) and developed a Low, Mid and High ROE estimate using each averaging period.

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

A. In Stage 1, my estimates of dividend payments are based on the earnings growth estimates from Yahoo Finance, Value Line and Zacks. For the Mid ROE estimate, I

used the average of the three sources. For the Low and High ROE estimates, I used the lowest and highest, respectively, of those three estimates.

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

A. Beginning 11 years into the future, I assume the dividend payments will grow at the same rate as the long-term growth of the economy, as measured by the U.S. Gross Domestic Product ("GDP"). My estimate of long-term GDP growth is based on historical real GDP growth plus 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 historical GDP over the period 1929 to 2023, during which the U.S. economy grew in real terms at an average rate of 3.18% per year. This is a reasonable estimate of future real economic growth in the U.S. economy over the last 90 years because it is based on actual real economic activity over the long-term.

Q. How did you develop your estimate of inflation?

A. I averaged three sources to estimate inflation. First, I used the average of the last 180 days as of January 11th, 2024, 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 2030–2050 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 2030–2050 as reported by the EIA. The inflation measures and the average are shown in Table 4 below:

Table 4: Inflation Assumption

10-Year Breakeven Inflation Rate	2.31%
CPI	2.28%
GDP Chain-Type Price Index	2.38%
Average Results	**2.32%**

Q. Please summarize your nominal GDP growth estimate.

A. My nominal GDP growth estimate was developed by combining my estimates of real GDP growth and inflation, each of which are described above. The result is shown in Table 5.

Table 5: Long-Term GDP Growth Estimates

Real GDP Growth	3.18%
Inflation	2.32%
Nominal GDP Growth	**5.50%**

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 5.50%, based on the calculation

shown in Table 6 below. Growth rates for years 6-10 provide for a linear transition between Stages 1 and 3.

Table 6: Stage 2 Growth Rate 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%	5.92%	5.83%	5.75%	5.67%	5.58%	**5.50%**

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 in perpetuity?

A. No, setting the Stage 3 growth to my GDP outlook in perpetuity does not imply that an investor will hold a company's stock in perpetuity. 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 discussed 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 in 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 7 below and my calculations are provided in **Direct Schedule JC-5**:

Table 7: Multi-Stage DCF Calculations Results

Averaging Period	Low	Mid	High
30-day	9.61%	9.90%	10.34%
90-day	9.69%	9.99%	10.43%
180-day	9.52%	9.81%	10.24%
Average Results	**9.61%**	**9.90%**	**10.34%**

Q. What do you conclude about your results the Multi-Stage DCF model?

A. I conclude that the range of reasonable estimates for the Company's ROE, based on the Multi-Stage DCF model is 9.61% and 10.34%.

c. <u>Capital Asset Pricing Model</u>

Q. Please summarize the CAPM model.

A. The 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 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 Liberty Midstates. I provide these estimates for the proxy group.

Q. Please provide the analytical form of the CAPM.

A. The CAPM is defined as the follows:

$$RRi = Rf + \beta i(Rm - Rf)$$

Where:

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

Rf is the risk-free rate;

β i is the beta coefficient of the investment; and

Rm 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 periods. Specifically, I averaged the yields on the 30-year treasuries for each of 30, 90, and 180 days, with each period ending as of January 11th, 2024 (the same periods shown in Table 2, above). The results of that analysis are shown in Table 8 below:

Table 8: Average Yields of 30-Year U.S. Treasuries

Period	Average
30-day Average	4.18%
90-day Average	4.53%
180-day Average	4.25%

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

A. I used multiple averaging periods for the same reason that other time series data are averaged over multiple periods; that is, to reduce the possibility of biasing my results by relying on outcomes from what may be transitory market conditions.

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 market. A higher coefficient indicates that the stock is riskier than the market and, conversely, a lower coefficient means that the security is less risky than the market. Beta is calculated by analyzing the returns of a security and the returns of the market over some historical period, and is mathematically defined as:

$$\beta i = Covariance\ (ri, rm)/Variance(rm)$$

where $\beta\, i$ is the beta coefficient of the security, *ri* is the return of the security, and *rm* is the return of the market. Calculation of the covariance between *ri* and *rm* measures the degree to which the returns of the security and market returns move together, while the variance of *rm* measures the degree of volatility in the market.

Q. How did you estimate the beta coefficient?

A. The beta coefficients I use in my CAPM analysis are based on the average of the beta coefficients for the companies in my proxy group, which equals 0.86. The proxy group betas include market information through January 11, 2024, and are reported by Value Line. These are shown below in Table 9 and included as **Direct Schedule JC-6**.

Table 9: Proxy Group Companies

Company Name	Beta
Atmos Energy	0.85
Chesapeake Utilities	0.80
NiSource Inc.	0.90
Northwest Natural	0.85
ONE Gas Inc.	0.85
Spire Inc.	0.85
Southwest Gas	0.90
Gas Proxy Group Average	**0.86**

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

A. The primary relevance of the expected market return is its use to calculate the Market Risk Premium, which is defined by the term (Rm – Rf). 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 13.96%. My calculations are provided in **Direct Schedule 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 periods of 30, 90, and 180 days (the same as for stock prices) are shown in Table 10 below:

Table 10: Calculation of the Market Risk Premium

	30-day Average	90-day Average	180-day Average
Expected Market Return	13.96%	13.96%	13.96%
Risk-Free Rate	4.18%	4.53%	4.25%
Market Risk Premium	**9.77%**	**9.43%**	**9.70%**

Q. What were the results of your CAPM analysis?

A. Based on the three risk-free estimates I developed, as well as the proxy group average beta, and market risk premium calculations I describe above, the CAPM method calculations indicate that Liberty Midstates' ROE is between 12.56% and 12.61%. My calculations are summarized below in Table 11 and are also provided in **Direct Schedule JC-8**.

Table 11: CAPM Results

		30-day Average	90-day Average	180-day Average
Risk-free rate	*a*	4.18%	4.53%	4.25%
Beta	*b*	0.86	0.86	0.86
Expected market return	*c*	13.96%	13.96%	13.96%
Market risk premium	*d = c - a*	9.77%	9.43%	9.70%
CAPM ROE	*e = a + b*d*	12.56%	12.61%	12.57%
Average ROE	***Average of e, f***	**12.58%**		

d. Bond Yield Plus Risk Premium Model

Q. Please summarize the RPM Model.

A. The Bond Yield Plus Risk Premium Model is another way of estimating the cost of equity by employing similar principles to the CAPM model. In essence, equity investors must be compensated for the additional risk they incur by investing in riskier assets such as equities. The RPM approach estimates the cost of equity as the sum of the equity risk premium and the yield on a particular class of bonds. For my analysis, I used actual authorized returns for gas utilities as the historical measure of the cost of equity and the 30-year Treasury Rate for my risk-free rate.

Q. Please explain how you performed your RPM analysis.

A. First, I defined the risk premium as the difference between historical authorized ROEs and the then-prevailing 30-year Treasury Rate. I utilized authorized ROEs from gas

rate case proceedings dating back 15 years. I then matched the 30-year Treasury Rate at that time to the decision date. I then graphed a scatterplot of the relationship between the 30-year Treasury Rates and the Risk Premia in order to conduct a regression analysis that would produce a predictive formula in the following form:

$$\boldsymbol{RP = \alpha + \beta(T)}$$

Where:

RP is the risk premium;

α is the intercept term;

β is the slope term; and

T is 30-year Treasury Rate.

Q. How did you determine the historical period you used for your analysis?

A. I sourced past rate case decisions from S&P. Its database goes to 1978 though I felt that a time period of 15 years was sufficient enough to provide a representative overview of the relationship between recent rate cases and corresponding Treasury Rates. More specifically, a 15-year period is long enough to capture multiple business cycles – which incorporates changes in treasury rates – while still being relative to today in order to create a meaningful sample.

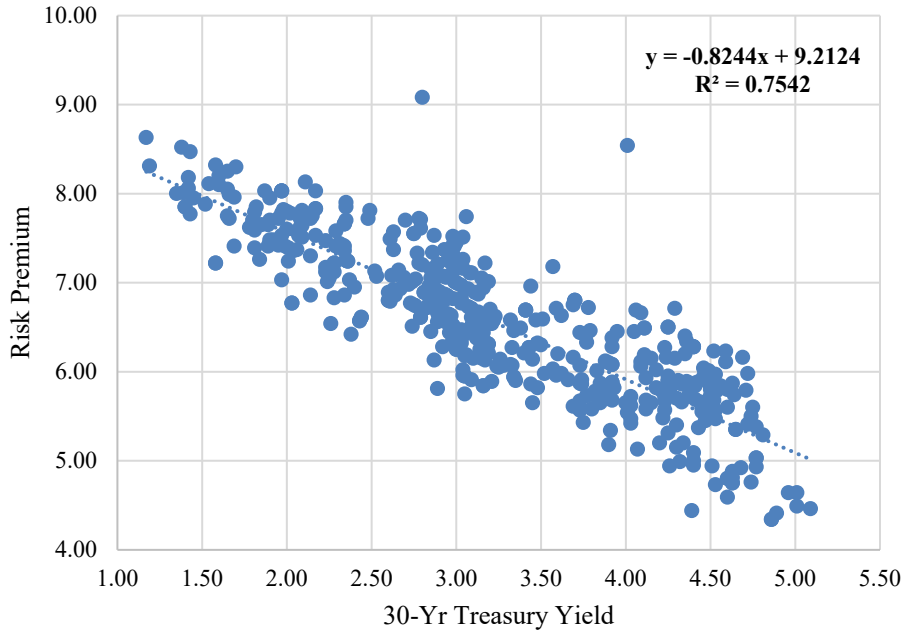
Q. What were the results of your regression?

A. A simple regression on the scatterplot below resulted in coefficients of α equal to 0.09212[9] and β equal to -0.8244. From there, I applied the 30-, 90-, and 180-day average 30-year Treasury rates to the above equation to calculate my risk premium. To estimate the implied ROE, I then added the resulting risk premium to the 30-year

[9] The coefficient displayed in the chart is shown assuming as the percentage times 100 (i.e., 9.212% x 100 = 9.212).

Treasury Rate. Figure 1 below shows the relationship between the 30-Yr Treasury Yield and the Risk Premium over the last 15 years.

Figure 1: Relationship between 30-Year Treasury Yield and Risk Premium (2008 - 2023)



Q. Why is this regression statistically significant?

A. The regression equation shown in Figure 1 uses a 95% confidence interval, which is a commonly accepted threshold for statistical significance. The formula also has an R-squared of 0.7542 meaning 75.42% of the variability in the dependent variable (risk premium) is explained by the independent variable (30-Yr treasury yield). This level of R-squared indicates the formula is a good fit for the data.

Q. What were the results of your RPM model?

A. Based on the methodology described above, my RPM model indicates that Liberty Midstates's ROE is between 9.95% and 10.01%. The results of my RPM analysis are shown in Table 12 and are also provided in **Direct Schedule JC-10**.

Table 12: RPM Results

		30-day Average	90-day Average	180-day Average
Intercept term	α	0.09212	0.09212	0.09212
Slope term	β	-0.8244	-0.8244	-0.8244
30-year Treasury Rate	T	4.18%	4.53%	4.25%
Risk premium	$RP = \alpha+\beta(T)$	5.77%	5.48%	5.71%
ROE	$RP+T$	9.95%	10.01%	9.96%
Average ROE	***Average of e***	**9.97%**		

Q. Has the Commission recognized authorized ROEs in other jurisdictions are a relevant consideration when determining the appropriate authorized ROE for a utility?

A. Yes, it has. As noted earlier, the Commission has acknowledged the use of risk premium models which rely on authorized ROEs in other jurisdictions. I believe my RPM is a reasonable proxy considering it covers multiple business and interest rate cycles and provides a high statistical correlation. More importantly, previously authorized ROEs are publicly available information and are a benchmark an investor will consider in making his or her investment decisions therefore using authorized ROEs from other jurisdictions is crucial to determine Liberty Midstates's ROE so it is competitive with other companies competing for investor capital.

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

A. As I previously described, using the Constant Growth DCF method, I calculated estimates of Liberty Midstates's ROE that range from 9.28% to 11.81%. Using the Multi-Stage DCF method, I calculated estimates of Liberty Midstates's ROE that ranges from 9.61% to 10.34%. Using the CAPM method, I calculated estimates of Liberty Midstates's ROE that range from 12.56% to 12.61%. Using the RPM method,

I calculated estimates of ROE that range from 9.95% to 10.01%. Averaging all four approaches as demonstrated by Table 13 below, I came to an ROE range of 10.35% to 11.19%.

Table 13: Aggregation of Preliminary Analytical Results

	Low	Mid	High
Constant Growth DCF	9.28%	10.34%	11.81%
Multi-Stage DCF	9.61%	9.90%	10.34%
CAPM	12.56%	12.58%	12.61%
RPM	9.95%	9.97%	10.01%
Average	**10.35%**	**10.70%**	**11.19%**

e. Adjustment for Flotation Costs

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

A. Yes, I made adjustments to my preliminary range. Specifically, I incorporated an adder to account for security flotation costs in my estimate.

Q. What are security flotation costs?

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

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

A. Yes, flotation costs should be recovered through ROE rather than through operating expense. A utility's cost to issue new stock is part of its capital rather than operating costs. If a company cannot recover its flotation costs through ROE, its actual ROE will be less than that required by investors to own the stock. This will, in turn, impair the company's ability to attract the capital required to operate a safe and reliable system.

This situation could become particularly problematic if other utilities with whom the Company competes to attract capital are allowed recovery of their flotation costs while Liberty Midstates is not.

Q. Does Liberty Midstates issue common stock publicly?

A. No, it does not.

Q. If not, why should Midstates receive an adjustment to its ROE for flotation costs?

A. Midstates third party external source of common equity is through its ultimate parent Algonquin Power & Utilities Corp. ("APUC"). APUC is competing with other utility holding companies for external common equity capital. If the source of APUC's returns to common equity investors include the results from its owned regulated utilities then their returns need to reflect the cost of issuing that common equity to the public.

Q. Are flotation costs accounted for in DCF, CAPM, and RPM models you used to develop the preliminary estimates?

A. No, flotation costs are not accounted for in the DCF, CAPM and RPM models I used to develop the preliminary estimates. The models are designed to estimate the returns that an investor would require for holding a stock based on expected dividend payments (in the case of the DCF models) and/or has a certain risk profile (in the case of the CAPM and RPM). For purposes of this proceeding, that required return is used as a proxy for the Company's ROE since the authorized return must match investor requirements to enable Liberty Midstates to attract capital. Because the DCF, the CAPM, and the RPM models are primarily designed to estimate the ROE for a regulated utility, they do not take flotation costs into consideration.

Q. How did you estimate Liberty Midstates' flotation cost adjustment?

A. I estimated Liberty Midstates's flotation costs by examining the costs of issuing equity incurred by the proxy group companies in their two most recent common equity issuances. After calculating the average flotation costs for the proxy group, 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 **Direct Schedule JC-11**.

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

A. Using this method, I estimate that the ROE adder required to cover flotation costs is 0.08%.

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

A. In Table 14 below, I added the flotation cost adjustment to the preliminary ROE estimates I previously described.

Table 14: Flotation Adder Effect to ROE Range

	Low	**Mid**	**High**
Preliminary estimate	10.35%	10.70%	11.19%
Flotation costs	0.08%	0.08%	0.08%
ROE estimate	**10.43%**	**10.78%**	**11.28%**

Based on the information shown in Table 14, I conclude that Liberty Midstates's authorized ROE should fall within the reasonable range of 10.43% to 11.28%.

Q. What was the last gas rate decision by this Commission on return on equity?

A. The last decision on ROE as a contested issue before the Commission in a gas base rate case was in Spire Missouri's gas rate case in Docket No. GR-2021-0108 effective November 27, 2021. The Commission authorized Spire an ROE of 9.37% in that case.

Q. At the time of the decision, what were thirty-year Treasury bond rates?

A. For the thirty days ending October 27, 2021, the average of thirty-year Treasury bond rates was 2.04%.

Q. Where are thirty-year Treasury bond rates today?

A. For the thirty days ending January 11, 2024, thirty-year Treasury bond rates averaged 4.18%. That represents an increase of 214 basis points since the Commission's decision in the Spire Missouri 2021 rate case. The cost of capital has clearly increased.

VI. ADDITIONAL CONSIDERATIONS

Q. Are there any other factors that could impact your recommendation for Liberty Midstates' ROE?

A. Yes. In this section of my testimony, I explain that the Company is exposed to additional risk that is not captured in my financial analysis of the proxy group. Notably, Liberty Midstates is considerably smaller than the utilities in the Proxy Group, a situation that creates risk for the Company's investors for which they will need to be compensated with a higher return. I will not recommend additional cost of equity adjustments based on this factor, but it should be considered in terms of the appropriate ROE that the Commission decides to authorize.

a. Small Size Premium

Q. Do investors perceive that smaller utilities are riskier than larger ones?

A. In my professional opinion, investors perceive that smaller utilities are riskier than larger ones. There is a broad body of research that has determined the existence of a "firm size effect" on firms in general, and utilities in particular, that requires smaller companies to provide higher returns than larger companies in the same industries.[10] Smaller utilities have smaller customer bases, fewer financial resources, and are less diversified in terms of customers and geography.[11] These challenges increase investors' risks of owning securities in small companies which, in turn, require them to pay a higher return in order to attract capital. In addition, due to their smaller size companies do not have access to the same markets and investor groups as larger companies because larger investors generally require more liquidity for the securities they purchase which smaller companies cannot provide.

Q. Is the Company smaller than the other companies in the proxy group?

A. The Company is considerably smaller than the companies in the proxy group. As shown in **Direct Schedule JC-12**, Liberty Midstates is much smaller than the smallest member of the proxy group, measured by customer count.

Q. Are there other ways to measure firm size?

A. Yes. Market capitalization is also a useful measure of firm size. To compare the Company to the proxy group along these terms, I estimated its market capitalization by

[10] 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.
[11] Duff & Phelps, *2018 Cost of Capital: Annual US Guidance and Examples*, 2018 at Chapter 4 p. 2.

applying the median market-to-book ratio of the proxy group companies (1.38) to Liberty Midstates's equity of $134.9 million. The resulting implied market capitalization for Liberty Midstates is approximately $186.1 million, or about 5.16% of the median market capitalization ($3,605 million) for the proxy group companies.

Q. What did you conclude regarding a small size premium for Liberty Midstates' ROE?

A. By calculating an implied market capitalization for the Company, I was able to evaluate the impact of Liberty Midstates's small size on its ROE relative to the proxy group companies. In its Cost of Capital Navigator, Duff & Phelps calculates size premia associated with deciles of market capitalizations, as well as categorizations of Mid Cap, Low Cap, and Micro Cap. As shown in **Direct Schedule JC-12**, the mean market capitalization of the proxy group companies is $6.18 billion, which falls into the third decile of market capitalization and corresponds to a size premium of approximately 0.57%. The median market capitalization of $3.61 billion falls into the fifth decile of market capitalization and corresponds to a size premium of 0.93%. Liberty Midstates's implied market capitalization of $186.1 million falls in the tenth decile and Micro Cap category. According to the Duff & Phelps data, Liberty Midstates merits a size premium of 4.83%, which is 3.90% - 4.26% higher than the size premium for the mean and median of the proxy group.

Q. Do you propose adjusting your reasonable range to account for the size premium?

A. No, I do not propose adjusting my reasonable range to account for the size premium. Estimating the size premium is a complex analysis that lacks the transparency of the calculations on which I relied for other aspects of my testimony. Liberty Midstates is

exposed to the small size premium, but the magnitude of the impact of this influence is a matter of debate in academic literature and limitations regarding data availability make the estimation less robust. The results of the size premium analysis should be considered as an additional input supporting Liberty Midstates's proposal that its authorized ROE be set at 10.80% which is the midpoint of my reasonable range.

VII. CAPITAL STRUCTURE

Q. What do you recommend from the Company's proposed common equity and long-term debt capital structure?

A. I recommend a capital structure of 52.9% common equity and 47.1% long-term debt.

Q. How did you arrive at this recommendation for Liberty Midstates?

A. First, I calculated the average common equity and long-term debt capital structure components for the proxy group companies over the more recent 8 quarters, as shown in **Direct Schedule JC-13**. Over this period, the mean and median capital structure of the proxy group was 50% common equity and 50% long-term debt. The resulting range of common equity ratios over this same averaging period for the proxy group was 37% to 61%. Second, I reviewed Liberty Midstates 13-month average capital structure (61% common to 39% total debt including 13% net short-term/money pool debt) and actual capital structure ratios (56% common to 44% total debt including 20% net short-term/money pool debt) as of the end of the historical year ended December 31, 2022, both of which have common equity ratios higher than my recommendation. Lastly, factoring in the forecasted results for 2023 of Liberty Midstates, which included i) the new $90.6 million of long-term debt issued on December 14, 2023[12]; ii) the retirement

[12] Missouri Commission approved Docket No. GF-2023-028 effective August 5, 2023 and the Illinois Commission in 23-0585 effective December 14, 2023.

of the $25.6 million intercompany note on May 1, 2023; and iii) 2023 retained earnings, the resulting capital structure was 52.9% common equity, 47.1% long-term debt and 0% short-term debt/net money pool. The 52.9% common equity ratio is below the historical Company levels and within the range of my proxy group.

Q. Is short-term debt/money pool borrowings included in your capital structure recommendation?

A. I excluded short-term debt/money pool borrowings in my capital structure recommendation based on calculations of Liberty Midstates's forecasted and test year results as well as my proxy group companies.

Q. Why did you exclude short-term debt/money pool borrowings?

A. **Direct Schedule JC-14** shows the balances of CWIP, deferred gas costs and short-term debt for each of the proxy group companies over the last 2 years dating back to 2021. Short-term debt or money pool borrowings of the proxy group were used to fund construction work in process ("CWIP") and deferred gas costs, which are short-term needs and which also carry their own rate of return. CWIP receives an allowance for funds during construction ("AFUDC") rate of return based on the short-term debt rate and deferred gas costs also receive a carrying charge which approximates a short-term debt rate. Over the 2-year period, short-term debt slightly exceeded the CWIP and deferred gas costs balances based on the mean for the proxy group but the range varied amongst the proxy group companies. Therefore, to avoid double-counting the recovery of short-term debt interest and diluting the return on permanent rate base I have excluded short-term debt/money pool from the permanent capital structure of my proxy group companies. I performed the same analysis for Liberty Midstates as shown in

Direct Schedule JC-16 and calculated the 13-month average balance ending December 31, 2022, as allowed by the Commission in their Order in Docket No. GR-2021-0108, and in **Direct Schedule JC-15** I also pro-forma in the new long-term debt financing of $90.6 million. These adjustments combined to eliminate short-term debt/money pool balances from Liberty Midstates's test year period permanent capital structure. All of my calculations and adjustments are shown in **Direct Schedules JC-14** through **JC-17**.

Q. Did you perform any other capital structure analyses?

A. Yes, I did. I calculated the capital structure ratios for LUCo and APUC at year end 2022. My calculations are shown in **Direct Schedules JC-18** and **JC-19**.

Q. What were the results of your analysis of LUCo's and APUC's capital structure?

A. Based on year end 2022 actuals and pro-forming for LUCo and APUC, as well as reducing short-term debt for CWIP and deferred gas costs, LUCo's common equity ratio was 68.8% and its long-term debt ratio was 31.1%. APUC's common equity ratio was 65.7% and long-term debt ratio 30.2%. Both LUCo and APUC's common equity ratios are higher than my recommended common equity ratio for Liberty Midstates.

VIII. COST OF DEBT

Q. What is your recommended cost of debt?

A. Based on **Direct Schedule JC-17**, I am recommending 5.59% which reflects outstanding long-term debt at December 31, 2022, and the actual issuance of $90.6 million of new long-term debt at a rate of 5.774% on December 14, 2023, which financing was approved by the Commission in Docket No. GR-2023-0280 effective August 5, 2023 and by the Illinois Commerce Commission in Docket No. 23-0585

effective December 14, 2022, and the retirement of the $25.6 million intercompany note on May 1, 2023. The proceeds from the new long-term debt issuances were used to reduce the outstanding money pool balances and replace the $25.6 million of long-term debt that matured on May 1, 2023.

IX. CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your conclusions.

A. I conclude the reasonable range for the Company's ROE to be 10.43% to 11.28%, including a flotation cost adjustment. Second, the midpoint of my reasonable range is approximately 10.80%. Third, a capital structure of 52.9% common equity and 47.1% long-term debt falls within the range for my proxy group and is below Liberty Midstates's actual December 31, 2022 and thirteen-month average ended the same date. Lastly, the cost of debt – after the reflecting the December 14, 2023 issuance of the new $90.6 million of 5.774% long-term debt and the May 1, 2023 retirement of $25.6 million of long-term debt – is 5.59%.

Q. Please summarize your recommendations.

A. I recommend the Commission accept my (i) proposed authorized ROE of 10.80%, which is the approximate midpoint of my reasonable range, (ii) proposed capital structure of 52.9% common equity to 47.1% long-term debt, and (iii) proposed cost of debt of 5.59% for Liberty Midstates in this case, and, as a result, authorize a total rate of return of 8.35%.

Q. Does this conclude your Direct Testimony?

A. Yes.

VERIFICATION

I, John Cochrane, under penalty of perjury, on this 9th day of February, 2024, declare that the foregoing is true and correct to the best of my knowledge and belief.

/s/ John Cochrane