BEFORE THE WASHINGTON

UTILITIES & TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Complainant,

v.

PUGET SOUND ENERGY

Respondent.

DOCKETS UE-260005 & UG-260006

REVISED RESPONSE TESTIMONY OF AARON L. ROTHSCHILD ON BEHALF OF THE WASHINGTON STATE OFFICE OF THE ATTORNEY GENERAL PUBLIC COUNSEL UNIT

EXHIBIT ALR-1Tr

~~July 28~~August 26, 2026

REVISED AUGUST 26, 2026

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I. STATEMENT OF QUALIFICATIONS

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

A. My name is Aaron L. Rothschild. My title is President, and my business address is 15 Lake Road, Ridgefield, CT.

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

A. I am President of Rothschild Financial Consulting (RFC).

Q. Please state your educational achievements and professional designations.

A. I have a B.A. degree in mathematics from Clark University (1994) and an M.B.A. from Vanderbilt University (1996).

Q. Please describe your business experience.

A. I performed financial analysis in the telecom industry in the United States and Asia Pacific from 1996 to 2001, investment banking consulting in New York, complex systems science research regarding the power sector at an independent research institute, and I have prepared rate of return testimonies since 2002. See Aaron L. Rothschild, Exh. ALR-15 for my resume.

Q. Have you previously testified before the Washington Utilities and Transportation Commission, or other state commissions? If so, which commissions?

A. My expert witness experience also includes testifying in over 100 cost of capital proceedings before the following additional state commissions: California, Colorado, Connecticut, Delaware, District of Columbia, Florida, New Jersey, New York, Maryland, New Hampshire, North Dakota, Pennsylvania, Rhode Island, Tennessee, and Vermont. This is my first time testifying before the Washington

Utilities and Transportation Commission (UTC or Commission). See Rothschild, Exhibit ALR-17 for the list of dockets for each of my testimonies.

Q. On whose behalf are you providing this testimony?

A. I am testifying on behalf of the Washington State Office of the Attorney General, Public Counsel Unit (PCU).

II. INTRODUCTION

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

A. The purpose of my testimony is to address the cost of capital for Puget Sound Energy (PSE or Company) which includes the following three components:

1. **Cost of Equity (COE):** The return investors require to provide equity capital to a utility with PSE's specific risk profile.
2. **Cost of Debt:** The prevailing market interest rates and terms associated with the Company's debt obligations.
3. **Capital Structure:** The relative proportions of equity and debt used to fund the Company's operations.

Based on my analysis of these cost of capital components, I recommend an allowed rate of return (ROR) for ratemaking purposes, including an appropriate authorized return on equity (ROE), authorized cost of debt, and authorized capital structure. Please see Rothschild, Exhibit ALR-8 for a more detailed definition and discussion of these specific components.

Q. How do you define your role in providing this analysis?

A. My role is to provide the Commission a position and recommendation based on an objective analysis of the Cost of Capital. While my primary recommendation focuses exclusively on the return investors require to fund a utility with PSE's specific risk profile, my analysis also calculates the cost of equity for the overall market (market COE). I provide this market COE strictly as an economic benchmark and broader market context to ensure a principled and durable decision. My approach is grounded in the following framework:

- **The Commission as the Surrogate for Competition:** Because PSE operates as a regulated monopoly, the natural price-disciplining pressures of a competitive market are absent. In this vacuum, the Commission must act as a surrogate for the market. This is a significant and often difficult responsibility. It requires that the "price" of capital charged to ratepayers reflects its market cost, neither providing an unearned monopoly premium nor depriving the utility of the capital it needs to provide essential services.
- **Acknowledging the Weight of the Decision:** Former New York State Public Service Commission Chair Alfred Kahn reminds us in *The Economics of Regulation: Principles and Institutions* that the essence of regulation is the replacement of competition.[1] If the authorized return is disconnected from the actual COE, the result is an involuntary subsidy

[1] Alfred E. Kahn, The Economics of Regulation: Principles and Institutions, at 20 (MIT Press 1988).

from ratepayers to shareholders—an outcome that undermines the very purpose of regulation.

- **Providing an Informed Path Toward Market Alignment:** In this testimony, I strive to provide the objective, market-based information that balances utility financial health with ratepayer protection.

Importantly, keeping authorized ROEs in line with the market-based cost of equity is not just good for residential consumers; it is pro-business. Small businesses, industrial customers, and commercial enterprises all rely on affordable, predictable electricity and gas costs to compete and grow. Aligning PSE's authorized ROE with its cost of equity helps businesses manage their costs, which strengthens the state's overall economy.

Q. Are your recommendations consistent with legal requirements?

A. My recommendation is consistent with the following legal standards set by the United States Supreme Court for a fair rate of return: "[t]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks"[2] and "sufficient to… support its credit and… raise the money necessary for the proper discharge of its public duties."[3] My recommendations fulfill the *Hope* and *Bluefield* requirements that a utility should be able to raise capital on reasonable terms.

[2] *Fed. Power Comm'n v. Hope Nat. Gas Co.*, 320 U.S. 591, 603 (1944).
[3] *Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n of the State of W. Va.*, 262 U.S. 679, 692–693 (1923).

Q. How is your testimony organized?

A. First, I provide a summary of our recommendations and an overview of COE concepts. Second, I provide an explanation of the various models I used in my COE calculations. Third, I provide a COE analysis for the overall market (Market COE) as context for the appropriate ROE for PSE. Fourth, I provide my capital structure and cost of debt recommendation. Fifth, I provide an evaluation of PSE's rate of return testimony.

III. SUMMARY OF RECOMMENDATIONS

Q. Please provide a summary of your recommendations.

A. I recommend that the Commission reject Ms. Bulkley's recommended ROE of 10.8 percent because it significantly exceeds PSE's actual COE as indicated by current market data. Instead, I recommend that the Commission calculate PSE's rates based on the following:

- An overall cost of capital of 6.56% (6.50% - 6.72%);
- An ROE of 8.17% (8.03% - 8.55%)[4];
- A capital structure containing 44.00% common equity and 54.72% long-term debt; and
- A long-term debt cost rate of 5.33%.

A summary of my cost of capital recommendations for PSE's electric utility and natural gas distribution operations is presented in Table 1 on page 6.

[4] As discussed below my ROE recommendation is based on implementing various COE models with a reasonable range of between 8.03 percent - 8.55 percent.

Table 1: ALR Recommended Range Midpoint – Puget Sound Energy

TABLE 1: ALR RECOMMENDED RANGE MIDPOINT - PUGET SOUND ENERGY
Docket No.s UE-260005 and UE-260006

	Capital Structure Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	54.72%	5.33%	2.92%
Short-Term Debt	1.28%	3.60%	0.05%
Preferred Equity	0.00%	0.00%	0.00%
Common Equity	44.00%	8.17%	3.59%
Rate of Return			6.56%

Exhibit ALR-1

Q. Are you recommending a specific ROE of 8.17 percent or an ROE range of 8.03 percent to 8.55 percent?

A. I recommend both a range of appropriate ROEs and a specific point within that range that I consider to be the most appropriate. It is not possible to measure PSE's COE with the precision of measuring temperature with a thermometer. However, my recommended ROE range of 8.03 percent to 8.55 percent already eliminates the extreme ends of the results of my models and provides the Commission with a range of ROEs I feel confident will allow PSE to raise the capital it needs to provide safe and reliable service. I also recommend a specific point of 8.17 percent, which is at the midpoint of that range.

Q. Please summarize how you determined your 8.17 percent Cost of Equity recommendation for PSE.

A. To arrive at my recommendation, I applied the Constant Growth[5] and Non-Constant Growth versions of the Discounted Cash Flow (DCF) and eight variations

[5] The constant growth DCF model is a variant, or version, of the single-stage DCF model that uses a consistent, never-changing growth rate component in perpetuity.

of the CAPM methodologies[6] to a proxy group of regulated utility companies (the same group used by Ms. Bulkley). As discussed below, I utilize capital market data and cross-reference the model results of leading financial institutions as an additional check on the reasonableness of my model results.

I use a proxy group to calculate PSE's cost of equity because PSE does not have publicly traded stock data. Additionally, using a proxy group provides more reliable results because it is less likely to be skewed by specific circumstances or anomalies faced by any individual company during the time when I take a snapshot of the COE.

As shown in Table 2, Cost of Equity Model Results, the results of my cost of equity models, including eight variations of the CAPM and three variations of the DCF, range between 5.37 percent and 8.73 percent. Reducing the overall range of my results leads me to a reduced Recommended Cost of Equity range of 8.03 percent to 8.55 percent (with a recommendation of 8.17 percent).[7]

[6] CAPM stands for "Capital Asset Pricing Model." The CAPM relates return to risk; specifically, it relates the expected return on an investment in a security to the risk of investing in that security.

[7] I apply a statistical filtering approach by eliminating the top 10 and bottom 70 percent of COE model results to reduce the impact of short-term unsustainable market distortions that could overly impact any one of my models.

Table 2: Cost of Equity Model Results

TABLE 2: COST OF EQUITY MODEL RESULTS		
DCF	**Low**	**High**
Constant Growth - Sustainable Growth	8.66%	8.73%
Constant Growth - Option-Implied Growth	7.83%	8.09%
Non-Constant Growth	8.02%	8.29%
CAPM		
Spot (Jun. 30, 2026)		
Risk Free Rate - 3-Month T Bill	5.37%	6.96%
Risk Free Rate - 30-Yr T Bond	6.05%	7.26%
3-Mo. Weighted Average (Apr. to Jun. 2026)		
Risk Free Rate - 3-Month T Bill	5.67%	6.91%
Risk Free Rate - 30-Yr T Bond	6.40%	7.35%
Recommended Range	**8.03%**	**8.55%**
Midpoint of Range (Based on Percentiles)	**8.17%**	

Exhibit ALR-2

To ensure the robustness and real-world applicability of our findings, I validated these COE model results against the long-term capital market expectations of a broad cross-section of the financial community. As I explore in greater detail later in this testimony, this validation includes data from major financial institutions such as J.P. Morgan and Charles Schwab; and institutional investors, specifically the capital market assumptions of 41 major investment firms and institutional asset managers, including Bank of New York Mellon, BlackRock, and Goldman Sachs Asset Management.

As shown in Table 3 on page 9, major financial institutions, consulting firms, fund managers, and academics inform their clients to expect returns on the overall market (S&P 500) of 5.9 percent to 8.8 percent.

Table 3: U.S. Equity Return Expectations Among Major Financial Institutions

TABLE 3: U.S. EQUITY RETURN EXPECTATIONS AMONG MAJOR FINANCIAL INSTITUTIONS	
J.P. Morgan Asset Management - Equity Long-Term Returns (2026) [1]	**6.70%**
Charles Schwab - 10-year U.S. Large Cap Returns (Jan 2026) [2]	**5.90%**
Horizon Actuarial Services, LLC Survey - 20 Year Horizon (August 2025) [3]	
U.S. Equity - Large Cap (4.8-9.3%, 50% Percentile - 7.1%)	**7.10%**
U.S. Equity - Small / Mid Cap (4.8-10.0%, 50% Percentile - 7.3%)	**7.30%**
Aswath Damodaran (July 1, 2026) [4]	**8.65%**
Duff & Phelps / Kroll (April 2026) [5]	**8.50%**

Sources:
[1] J.P. Morgan Asset Management - 2026 Long-Term Capital Market Assumptions, 2025, page 12.
https://am.jpmorgan.com/content/dam/jpm-am-aem/americas/us/en/institutional/insights/portfolio-insights/ltcma-full-report.pdf
[2] Schwab's 2025 Long-Term Capital Market Expectations, January 3, 2025.
https://www.schwab.com/learn/story/whats-10-year-outlook-major-asset-classes
[3] Horizon Actuarial Services, LLC, Survey of Capital Market Assumptions Survey, August 2024, page 19.
Survey participants Include: Bank of New York Mellon, BlackRock, Goldman Sachs Asset Management, J.P. Morgan Asset Management, Merrill, Morgan Stanley Wealth Management, Royal Bank of Canada, UBS.
[4] New York University, Professor Aswath Damodaran
https://pages.stern.nyu.edu/~adamodar/
[5] Kroll Recommended U.S. ERP and Corresponding RFR to be Used in Computing Cost of Capital: January 2008 - Present,
https://www.kroll.com/en/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates
Note: Duff & Phelps acquired Kroll in 2021 and rebranded itself as Kroll.
Note: J.P. Morgan's 2025 Long-Term Capital Market Assumptions is an annual report.

Market participants responsible for deploying hundreds of billions of dollars in capital provide a range of return expectations that firmly support my 8.17 percent ROE recommendation. Firms such as Charles Schwab (5.9 percent), J.P. Morgan (6.7 percent), and the Horizon Actuarial Survey (7.1 percent for large-cap) project equity returns well below 8.17 percent. While sources like Kroll (8.5 percent) and Aswath Damodaran (~~8.8~~8.65 percent) report a higher cost of equity, these figures apply to the broader overall market -- comprising highly competitive, non-regulated companies such as Apple, Tesla, and Johnson & Johnson. Because a regulated utility like PSE carries significantly lower risk than the broader market, its required return is inherently lower. Taken together, this data provides a high degree of confidence and confirms that an 8.17 percent ROE is sufficient for PSE to attract equity capital.

Q. Please explain the rationale behind your recommended cost of equity range of 8.03 percent to 8.55 percent, and your specific point estimate of 8.17 percent.

A. My recommended range extends from the 70th to the 90th percentile, with a midpoint at the 80th percentile of my overall COE results.

A strict mathematical approach would point to the absolute 50th percentile (the median) of my results, which in this case is 7.30 percent. While I conclude this lower figure accurately reflects current, observable market-based realities, I am mindful that currently authorized ROEs across the industry remain disconnected from these lower market costs.

Rather than recommending an immediate drop to the 7.30 percent median, I have applied the regulatory principle of gradualism. To bridge the gap between currently authorized returns and actual market realities, I have consciously focused on the upper-tail of my results. By establishing a range between the 70th and 90th percentiles, I am providing a measured, transitionary recommendation that protects ratepayers from artificially inflated rates while ensuring the Company's financial stability is maintained during this market correction.

Q. Is this the same percentile range you use in all of your testimonies?

A. No, it is not, because the application of expert judgment requires looking at the specific data distribution in each individual case. For example, in my recent testimony before the Connecticut Public Utilities Regulatory Authority (the Aquarion case), I utilized a narrower 75th to 85th percentile range.

If I were to rigidly apply that exact same 75th to 85th percentile range in this proceeding, it would yield a Recommended Cost of Equity range of ~~8.03~~

8.08 percent to ~~8.55~~8.30 percent. By expanding the range to the 70th and 90th percentiles in this case, I am providing a wider view of the upper-end results to ensure my recommendation provides a robust, gradualist buffer despite the low median result.

Q. How did you arrive at your specific point estimate of 8.17 percent?

A. To arrive at my specific point estimate of 8.17 percent, I do not simply default to the mathematical midpoint of this range. Rather, I use the midpoint of the percentiles, the 80.0th percentile of my overall COE results. The selection of a point estimate requires the application of informed judgment. I conclude that selecting an ROE at the 80.0th percentile (8.17 percent) is reasonable and provides a generous accommodation to the Company. This deliberate adjustment ensures the authorized ROE is fully supported by the data while preventing abrupt rate shocks or market disruption.

Q. Do the long-term capital market expectations of the financial community highlight why your ROE recommendation and Ms. Bulkley's are so different?

A. Yes. A primary driver of the discrepancy is Ms. Bulkley's reliance on inputs that introduce an upward bias into her market return expectation. Specifically, her Constant Growth DCF model relies on Value Line's projected earnings per share (EPS) growth rates for the S&P 500 to derive an expected market return, which she calculates at 13.40 percent.[8]

While Value Line is an independent subscription service and does not face the exact same investment banking conflicts as traditional "sell-side" analysts, peer-

[8] Direct Testimony of Ann E.Bulkley, Exh. AEB-1T at 55:1–2 (filed Mar. 20, 2026).

reviewed academic research demonstrates that their long-term growth projections are nonetheless structurally inflated. A comprehensive study published in the *Journal of Banking & Finance* found that Value Line's three-to-five-year projections for earnings and stock returns "exhibit large positive bias". The authors isolated the root of this bias, noting that it appears to be "entirely due to the extreme upward bias in projected profit margins".[9]

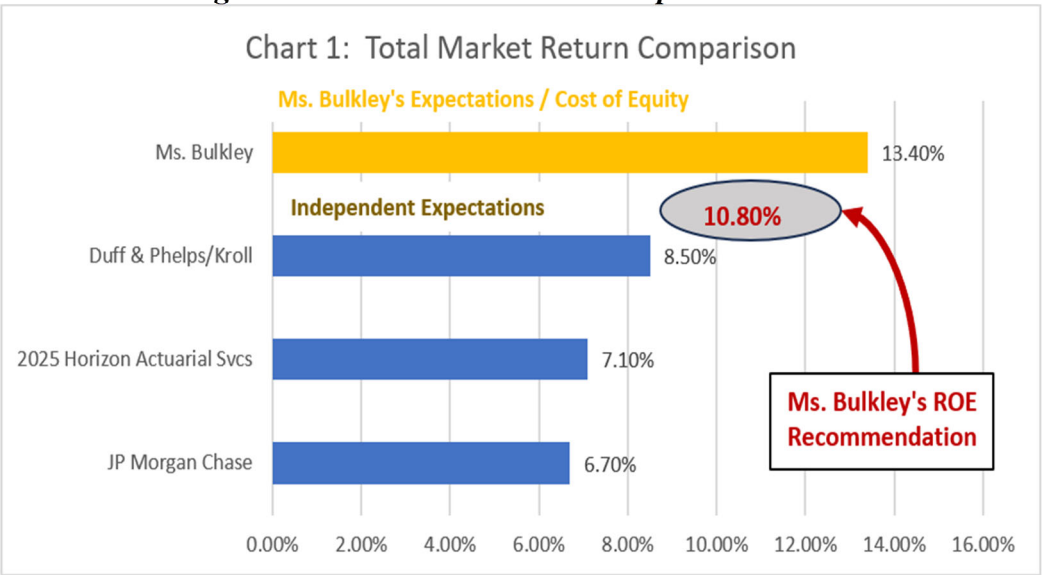
My goal is to ensure that the cost of equity estimates provided to the Commission are empirically sound and reflective of objective economic reality. The aforementioned study found that Value Line's three-to-five-year projections lack predictive power, concluding that their "extreme upward bias...calls into question the common practice of using these predictions as proxies for the cost of equity in cost-of-capital studies."[10] By utilizing these specific projected growth rates, Ms. Bulkley's analysis structurally overstates the expected market return.

Grounding the analysis in broader, observable market data ensures that my recommendation more accurately reflects the actual economic environment. Specifically, my CAPM analysis utilizes an overall market return component of 8.22 percent to 8.72 percent, which is derived directly from capital market data, including publicly traded stock and stock option prices. This range avoids the well-documented positive bias inherent in Value Line's long-term profit margin and earnings forecasts.

[9] Andrew C. Szakmary, C. Mitchell Conover, & Carol Lancaster, An examination of Value Line's long-term projections, *Journal of Banking & Finance* 820–833 (May 2008).
[10] *Id.* at 833.

As shown in Figure 1 below, Ms. Bulkley's singular reliance on Value Line's EPS growth rates suggests a market return of 13.40 percent, while broader perspectives and benchmarks from J.P. Morgan[11] (6.7 percent) and Horizon Actuarial Services[12] (7.1 percent) point to a reality that is nearly half of what Ms. Bulkley proposes.

Figure 1: Total Market Return Comparison



[11] J.P. Morgan Asset Management is a global asset management business that annually publishes its Long-Term Capital Market Assumptions to help institutional investors and advisors inform strategic asset allocation. Now in its 30th edition for 2026, this research provides projections that establish reasonable risk and return expectations over a 10- to 15-year time frame across more than 200 asset classes.

[12] Horizon Actuarial Services is an independent consulting firm that provides actuarial services to multiemployer defined benefit pension plans. In its annual Survey of Capital Market Assumptions, now in its 2025 edition, Horizon aggregates future risk and return expectations from 41 different investment advisory firms. This research provides composite forecasts over both 10-year and 20-year horizons to help evaluate the reasonableness of long-term investment return assumptions across various asset classes.

IV. REVENUE IMPACT ANALYSIS

Q. Please compare PSE's revenue requirement if your recommendations are adopted instead of Ms. Bulkley's.

A. Based on the $12,922.00 million rate base requested by PSE in its initial filing ($9,782 million for electric operations and $3,140 million for gas operations)[13], the difference in the revenue requirement is substantial. If my 8.17 percent cost of equity and capital structure recommendations are adopted, the rate of return portion of the revenue requirement would be approximately ~~$990.4~~$997.2 million.

Conversely, if Ms. Bulkley's 10.8 percent cost of equity and capital structure recommendations are used, the rate of return portion of the annual revenue requirement would rise to ~~$1,286.9~~$1263.0 million. This represents an annual overcharge to consumers of ~~$296.5~~$265.8 million. It is important to note that this overcharge impacts all customer classes, not just residential ratepayers.

To provide further perspective on the drivers of this difference, if my recommended 8.17 percent cost of equity were applied to Ms. Bulkley's proposed capital structure, it would result in a ~~$48.9~~$42.1 million annual revenue impact. This highlights that while the cost of equity is the primary driver, the choice of capital structure also carries significant weight for ratepayers.

I must clarify that these calculations are based specifically on the company's requested rate base as filed. Because the final rate base is subject to Commission approval, the absolute dollar impact may vary slightly when final rates are set;

[13] Tyler J. Pavel, Exh. TJP-3 (filed Mar. 20, 2026); Susan E. Free, Exh. SEF-3 (Mar. 20, 2026).

however, the relative magnitude of the savings remains consistent regardless of the final rate base determination.

Table 4: Annual Revenue Impact vs. Rothschild Recommendation

TABLE 4: ANNUAL REVENUE IMPACT VS. ROTHSCHILD RECOMMENDATION - PUGET SOUND ENERGY
($ million)

	Rate of Return Portion of Revenue Requirement		Difference versus Rothschild Recommendation	
Rothschild ROE & Cap Structure	~~$990.4~~	$997.2		
Rothschild ROE with Bulkley Cap Structure	$1,039.3		~~$48.9~~	$42.1
Bulkley ROE & Cap Structure	~~$1,286.9~~	$1263.0	~~$296~~	$265.8

Source/Inputs:

Requested Rate Base [1]	$12,922.0
Federal income tax rate	21.00%
State income tax rate	3.85%
Uncollectable Expense	0.00%

[1] Witness responsible: Susan E. Free, EXH. SEF-3 .

V. COST OF EQUITY METHODOLOGY

A. Overview

Q. Please provide an overview of your perspective regarding how capital markets relate to the COE and the overall Cost of Capital.

A. The cost of capital is the return investors require to provide capital to PSE based on current capital markets. To measure the cost of equity accurately, it is critical to use current market data because it increases the chance that the authorized ROE will match PSE's market-based COE when it needs to raise equity capital.

My COE recommendation reflects the return investors require to provide equity capital to PSE based on current capital markets. My recommendation is consistent with the following legal standards set by the United States Supreme Court for a fair rate of return: "[t]he return to the equity owner should be commensurate with returns on investments in other enterprises having

corresponding risks"[14] and "sufficient to… support its credit and… raise the money necessary for the proper discharge of its public duties."[15]

Because the cost of equity is not a published figure like a bond yield, some interpretation is required to determine the appropriate market price. My cost of equity recommendation is based on my computation of what the market indicates investors require (return on investment) to provide capital to companies with comparable risk to PSE.

As explained below, I use current market prices (e.g., stocks, bonds, options), which measure investors' expectations directly, instead of relying solely on historical data and analyst forecasts.

A COE based on current market prices (market-based) is superior to a COE based on historical data in two respects:

1. The COE that PSE has to pay investors is based on capital markets. Recent high inflation and increases in interest rates are not a secret and therefore market-based COE models will reflect investors' changing expectations.
2. Capital markets are unpredictable. Regarding capital markets' unpredictability, investment guru Warren Buffet recently gave the following advice to investors: "[t]hey should not listen to a lot of the

[14] *Hope Nat. Gas*, 320 U.S. at 603.
[15] *Bluefield Water Works*, 262 U.S. at 692–93.

jabbering about what the market is going to do tomorrow, or next week or next month because nobody knows."[16]

Current capital markets are our best source of investors' expectations regarding future capital markets. Current market prices of stocks and bonds reflect investors' forecasts for long-term interest rates and capital markets in general.

Q. Has your methodology been recognized by other commissions?

A. Yes. My CAPM method has also been recognized by state utility commissions. On April 9, 2020, the South Carolina Public Service Commission stated the following:

> Amongst the three witnesses, Consumer Affairs Rothschild's approach was unique in that he included the use of both historical and forward-looking, market-based data in his analysis. Based on the testimony and facts presented, the Commission therefore adopts the recommended ROE of 7.46% proposed by witness Rothschild.[17]

In a 2024 decision, the California Public Utilities Commission (CPUC) found merit in my analysis and used my cost of equity methodology, including the CAPM and DCF methods I use in this proceeding, to determine the authorized ROEs for California's ten Independent Small Telephone Companies (ILECs).[18]

[16] PBS News Hour, *America should stand for more than just wealth, says Warren Buffett*, Part 1 (June 26, 2017), www.pbs.org/newshour/show/pbs-newshour-full-episode-june-26-2017.[16] PBS News Hour, *America should stand for more than just wealth, says Warren Buffett*, Part 1 (June 26, 2017), www.pbs.org/newshour/show/pbs-newshour-full-episode-june-26-2017.

[17] S. Carolina Pub. Serv. Comm'n, *In Re the Application of Blue Granite Water Company for Approval to Adjust Rate Schedules and Increase Rates*, Order Ruling on Application for Adjustment in Rates, Docket No. 2019-290-WS, Order No. 2020-306, at 43 (Apr. 9, 2020), https://dms.psc.sc.gov/Attachments/Order/6bc32f94-f706-4d01-bd64-7be95ae75612.

[18] CPUC, *Decision Determining the Cost of Capital for Ratemaking Purposes for California's Independent Small Telephone Companies*, Application 22-09-003, at 22 (Sept. 16, 2024), https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M540/K719/540719032.PDF.

Q. How did you arrive at your COE recommendation?

A. To arrive at my recommendation, I applied the DCF model, including two Constant Growth and one Non-Constant Growth methods, and eight variations of the CAPM analysis to a group of similar companies (Bulkley Proxy Group) using data available through June 30, 2026, as discussed below. In all of my models, I use both historical averages and the most recently available spot data for the inputs wherever possible and applicable.

Q. Considering that stock and option prices and bond yields change daily, would it not be better to use historical averages exclusively for the inputs in your models?

A. Not necessarily. Most people would agree that the use of spot market data, the value of a particular input on a particular day, can lead to COE results that can vary over short periods of time. It may therefore be tempting to find a more stable value based on historical averages that are not overly influenced by short-term fluctuations in capital markets. When doing a forward-looking analysis, however, it is equally important to look at the most recent market data as an indication of trends and where a given value is more likely to be in the future. This is a broad and generally accepted principle, as made clear in the following example.

As a simple example using historical stock prices to make the point clear, if Company A's stock price were to go up linearly over the course of one year from $50 to $100, its average stock price over that year would be $75. If Company B's stock price declined linearly from $100 to $50 over the same year, it would have the same exact average stock price of $75. However, most people would agree that

predicting both stock prices at $75 over the near future would be overly simplistic and leave readily accessible data unused. Without relying on any additional data, at the very least, it would stand to reason that in the near future, Company A's stock price is more likely to be between $75 and $100 than Company B's stock price, and that Company B's stock price is more likely to be between $50 and $75 than Company A's stock price. These observations cannot be made by looking at the yearly averages alone and must take the most recent data into special consideration.

This does not eliminate concerns regarding the effect of daily fluctuations in market data, especially during periods of volatility. As a result, it is important to consider both historical averages and recent spot values when using market data for forward-looking analyses. That is precisely my approach when using market data that are expected to continue to fluctuate, such as stock prices, dividend yields, betas[19], and market risk premia.

Q. Can a difference of one day in the selection of spot data have a significant positive or negative effect on ROE results? If so, how do you go about choosing which day to use for market-based spot data?

A. Daily fluctuations in stock prices, resulting dividend yields, betas, etc., all have an impact on resulting ROE calculations, especially when using recent spot values for market data. Such is the nature of market data, which changes from day to day. This

[19] Beta is a component of the Capital Asset Pricing Model (CAPM) used to measure the systematic risk of a security relative to the overall market. Mathematically, it is the covariance of the return on an individual security with the return on the market portfolio, divided by the variance of the market return. In practice, Beta serves as a scaling factor: a Beta of 1.0 indicates a security that moves in tandem with the market, while a Beta below 1.0, typical for regulated utilities, indicates the security is less volatile than the broader market.

is rightfully noted as a potential risk of using spot data, but, given the stated benefits of using recent spot data for forward-looking analyses, there are ways to address such potential pitfalls.

For this reason, it is very important to establish consistent methodologies that eliminate the possibility of personal bias, especially when using spot market data. I consistently use the last trading day of the month as the reference point for all market-based spot data. Additionally, this day serves as the cutoff for calculating all historical market-data averages.

It is important to keep in mind that even averages fluctuate over time, and all responsible data analysts must find a consistent and reproducible way to "freeze time" to work with such fluctuations while eliminating bias.

It is also important to point out once again that I use recent spot market data to establish one benchmark for market-based inputs, which are balanced by the use of historical averages, as stated previously.

B. Proxy Group Selection

Q. What proxy groups did you use to calculate PSE's COE?

A. My comparable proxy group, shown on Table 5 and referred to as the Bulkley Proxy Group, consists of the following 19 publicly traded electric and natural gas companies covered by Value Line. Ms. Bulkley's proxy group contains the same 19 companies.

Table 5: Bulkley Proxy Group Composition

TABLE 5: BULKLEY PROXY GROUP COMPOSITION

	Company Name	Ticker
1	NI SOURCE INC.	NI
2	ALLIANT ENERGY	LNT
3	AMEREN	AEE
4	AMERICAN ELEC. PWR.	AEP
5	AVISTA CORP.	AVA
6	CMS ENERGY CORP.	CMS
7	DOMINION ENERGY	D
8	DTE ENERGY CO.	DTE
9	ENTERGY CORP.	ETR
10	EVERGY, INC.	EVRG
11	IDA CORP, INC.	IDA
12	NEXTERA ENERGY	NEE
13	OGE ENERGY CORP.	OGE
14	PINNACLE WEST	PNW
15	PORTLAND GENERAL	POR
16	PPL CORPORATION	PPL
17	SOUTHERN COMPANY	SO
18	WEC ENERGY GROUP	WEC
19	XCEL ENERGY	XEL

I chose this proxy group because I believe it contains companies that are relatively comparable in risk to PSE. However, model results based on this proxy group should be viewed as a conservative estimate of PSE's COE because these companies have some unregulated operations which are riskier than electric utility and natural gas distribution.

In a regulated environment, PSE operates under a regulatory framework that provides for the recovery of prudently incurred costs and a reasonable opportunity to earn a return. Conversely, unregulated operations are riskier because they are

subject to competition. Because investors demand a higher return to compensate for greater uncertainty, the proxy group's COE is likely higher than PSE's.

C. Discounted Cash Flow Models

Q. Please summarize the results of your DCF models.

A. I used both the constant growth form of the DCF method, which determines growth based on the sustainable retention growth procedure, and a non-constant growth DCF method. The results of my constant growth DCF model range between 8.66 percent and 8.73 percent when using a sustainable growth rate, and between 7.83 percent and 8.09 percent when using an option-implied growth rate.[20] The results of my non-constant growth DCF method indicate a COE of between 8.02 percent and 8.29 percent for the Bulkley Proxy Group.[21]

Q. What is the Discounted Cash Flow method?

A. The DCF method is an approach to determine the COE. The method recognizes that investors purchase common stock to receive future cash payments. These payments come from: (a) current and future dividends, and (b) proceeds from selling stock. A rational investor will buy stock to receive dividends and ultimately to sell the stock to another investor at a gain. The price the new owner is willing to pay for stock is related to that buyer's expectation of the future flow of dividends and the future expected selling price. The value of the stock is the discounted value of all

[20] Aaron L. Rothschild, Exh. ~~ALR-4 at 1 (Discounted Cash Flow)~~ALR-2. [21] *Id.* ~~at 3–4~~.

future dividends until the stock is sold plus the value of proceeds from the sale of the stock.

D. Constant Growth Form of the DCF Model

Q. You state you used the constant growth form of the DCF model. What is the constant growth form of the DCF model?

A. The constant growth form of the DCF model is a form of the DCF method that can be used in determining the COE when investors can reasonably expect that the growth of retained earnings and dividends will be constant.

Retained earnings are funds that a company keeps in its treasury, so that they are available for future needs, such as capital expenditures, debt payments, and new investments. These retained earnings show investors whether the company is growing, which, in turn, is a measure of the future indicator of dividends and the value of a company's stock.

Q. Describe how the constant growth model works.

A. The constant growth model is described by the equation k= D/P + g, where:[22]

k= cost of equity (COE);
D=dividend; and
P=market price of stock at time of the analysis

and where:

g=the growth rate, where g= b x r + s x v;
b=the earnings retention rate;
r=return on common equity investment (referred to below as "book equity");
v=the fraction of funds raised by the sale of stock that increases the book value of the existing shareholders' common equity; and

[22] Myron J. Gordon, *Cost of Capital to a Public Utility*, at 32–33 (MSU Pub. Util. Studies 1974).

s=the rate of continuous new stock financing

The constant growth model is therefore correctly recognized to be:

$$k=D/P + (b \times r + s \times v)$$

The COE demanded by investors is the sum of two factors. The first factor is the dividend yield. The second factor is growth (dividends and stock price). The logical relationship among these factors is as follows: the dividend yield is calculated based on current dividend payments, while growth indicates what dividends and stock price will be in the future.

Q. What other factors impact how one uses the constant growth form of the DCF model?

A. Sufficient care must be taken to be sure that the growth rate "g" is representative of the constant sustainable growth. To obtain an accurate constant growth DCF result, the mathematical relationship between earnings, dividends, book value and stock price must be respected.

The basic difference between the use of an analyst's earnings per share growth rate in the constant growth DCF formula and using the "b x r" (b (the earnings retention rate) times r (rate of return on common equity investment)) approach is that the "br" form, if properly applied, eliminates the mathematical error caused by an inconsistency between the expectations for earnings per share growth and dividends per share growth. Because it eliminates that error, the results of a properly applied "br" approach will be superior to the answer obtained from other approaches to the constant growth form of the DCF model. This is not to say that even a properly applied "br" approach will be perfect. The self-correcting

nature of a properly applied "br" to forecasted differences in earnings per share and dividends per share growth rates helps to mitigate the resultant error, but should not be viewed as the perfect way to quantify the impact of expected non-constant growth rates.[23]

Q. How have you implemented the constant growth form of the DCF model in this case?

A. I have applied the constant growth form of the DCF model by staying true to the mathematically derived "k=D/P + (b x r + s x v)" form of the DCF model. I have also taken care to fully allocate all future expected earnings to either future cash flow in the form of dividends (D) or to retained earnings (the retention rate, b). This extra accuracy is obtained only when the retention rate "b" is derived from the values used for "D" and "r," rather than independently.

Q. Please explain how you obtained the values you used in the constant growth form of the DCF method.

A. The DCF model generally calls for the use of the dividend expected over the next year. A reasonable way to estimate next year's dividend is to annualize the current quarterly dividend and increase that amount by one-half of the expected annual growth rate. This is a good approximation of the rate that would be obtained if the full prior year's dividend were escalated by the entire growth rate.[24]

[23] Eugene F. Brigham & Michael C. Ehrhardt, *Financial Management: Theory & Practice* (15th Ed. 2017) (discussing the constant growth model and the mathematical relationship between the retention ratio and return on equity to determine sustainable growth).

[24] For example, assume a company paid a dividend of $0.50 in the first quarter a year ago, and has a dividend growth rate of 4 percent per year. This dividend growth rate equals $1.04^{0.25} - 1 = 0.00985$, or 0.985 percent per quarter. Thus, the dividend is $0.5049 in the second quarter, $0.5099 in the third

I obtained the stock price—"P"—used in my DCF analysis from the closing prices of the stocks on June 30, 2026. I also obtained an average stock price for the 12 months ending June 30, 2026 by averaging the high and low stock prices for the year.

I based the value of the future expected return on equity— "r" —on the average return on book equity expected by Value Line, adjusted in consideration of recent returns. This computation incorporated these other inputs as well, including the earned return on equity consistent with analysts' consensus earnings growth rate expectations and actual earned returns on equity, as detailed in Rothschild, Exhibit ALR-3.[25] For a stable industry such as utility companies, investors will typically look at actual earned returns on equity as one meaningful input into what can be expected for future earned returns on book equity.[26]

Since the stock prices for the comparative companies are currently substantially higher than their book value, the return investors expect to receive on their market price investment is considerably less than the anticipated return on book value. Much like a rental property whose market value doubles, causing the percentage return on that new market price to drop even if the rent and original book value remain constant, an increasing utility stock price mathematically drives

quarter, and $0.5149 in the fourth quarter. If that 4 percent per annum growth continues into the following year, then the dividend would be $0.5199 in the first quarter, $0.5251 in the second quarter, $0.5303 in the third quarter, and $0.5355 in the fourth quarter. Thus, the total dividends for the following year equal $2.111 (0.5199 + 0.5251 + 0.5303 + 0.5355). I computed the dividend yield by taking the current quarter (the $0.5149 in the fourth quarter in this example) and multiplying it by 4 to get an annual rate of $2.06. I then escalated this $2.06 by half the 4 percent growth rate, which means it is increased by 2 percent. $2.06 x 1.02 = $2.101, which is within one cent of the $2.111 obtained in the example.

[25] Rothschild, Exh. ALR-4 at 1 (Discounted Cash Flow).
[26] *Id.*

down the expected return on the market price relative to the expected return on book equity. This return on book equity expectation used in the DCF method to compute growth must *not* be confused with the COE. If the market price is low relative to book value, the COE will be higher than the future expected return on book equity, and if the market price is high, then the return on book equity will be greater than the COE.

In addition to growing through the retention of earnings, utility companies also grow by selling new common stock. Selling new common stock increases a company's growth. I quantified this growth caused from the sale of new common stock by multiplying the amount that the actual market-to-book ratio exceeds 1.0, by the compound annual growth rate of stock that Value Line forecasts. As explained more in Rothschild, Exhibit ALR-11, I used this formula because it represents the "sv" component of the sustainable growth equation, which captures the additional growth in book value per share that occurs when new equity is issued at a premium to book value. The results of that computation are shown on line 4 of Rothschild, Exhibit ALR-4 at 1.

Pure financial theory prefers concentrating on the results from the most current price because investors cannot purchase stock at historical prices. There is a legitimate concern, however, about the potential distortion of using just a single price. I present DCF results based on the most recent stock pricing data (June 30, 2026) as well as the average of the high and low stock price over the past 12 months to obtain a range of reasonable values. The DCF result based on the average of the high and low stock price for the year ending June 30, 2026 is 8.66 percent. As

shown in Rothschild, Exhibit ALR-4 at 1, the DCF result based on the stock price as of June 30, 2026 is 8.73 percent. Rothschild, Exhibit ALR-4 at 1, shows more of the specifics of how I implemented the constant growth form of the DCF model for the Bulkley Proxy Group.

Q. Please explain how you determined what value to use for "r" when computing growth in your constant growth form of the DCF model.

A. The inputs I considered are shown in Footnote [C] of Rothschild, Exhibit ALR-4 at 1. The value of "r" that is appropriate to use in the DCF formula is the value anticipated by investors to be maintained on average in the future. This Exhibit shows that the average future return on equity forecasted by Value Line for the Bulkley Proxy Group between 2026 and 2029-31 is 11.24 percent. The same footnote also shows that the future expected return on equity derived from the Zacks[27] consensus forecast is 11.78 percent, and that the actual returns on equity earned by the Bulkley Proxy Group on average were 10.17 percent in 2023, 10.58 percent in 2024, and 10.82 percent in 2025. Based on the combination of the forecasted return on equity derived from the Zacks consensus, the recent historical

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[27] Zacks is a prominent research platform that aggregates earnings estimates from independent investment analysts.

actual earned returns, and Value Line's forecast, I made the DCF growth computation using a 11.00 percent [28] value of "r".

Q. What COE is indicated by the constant growth form of the DCF method that you rely on for your recommendation?

A. The result of my DCF analysis using the Constant Growth form of the DCF indicates a COE range of between 8.66 percent and 8.73 percent for the Bulkley Proxy Group.[29] Since these DCF findings use analysts' forecasts to derive sustainable growth (in part) and on analysts' forecasts of dividend growth and book value growth in the non-constant form of the DCF method, the results should be considered as conservatively high. This is because, as previously mentioned above, analysts' forecasts of such growth have been notoriously overstated, and because, as noted, the COE in general is declining.

My results are not as influenced by overly optimistic analysts' forecasts as would have been the case had I merely used analysts' five-year earnings growth rate forecasts as a proxy for long-term growth. This is because the DCF methods I use compute sustainable growth rates, rather than growth rates that can exaggerate the growth rate due to assuming that a relatively short-term forecast (five years) will remain indefinitely.

[28] I used 11.00 percent in consideration of historical returns, Zacks's projections, and Value Line projected returns for the Bulkley Proxy Group.

[29] Rothschild, Exh. ALR-4 at 1 (Discounted Cash Flow).

Q. Please explain how you implemented the non-constant growth form of the DCF model.

A. The non-constant growth form of the DCF model determines the return on investment expected by investors based on an estimate of each separate annual cash flow the investor expects to receive. For the purpose of this computation, I have incorporated Value Line's detailed annual forecasts to arrive at the specific non-constant growth expectations that an investor who trusts Value Line would expect. This implementation is shown on Rothschild, Exhibit ALR-4 at 3 and Exhibit ALR-4 at 4. In the first stage, cash flow entry is the cash outflow an investor would experience when buying a share of stock at the market price. The subsequent years of cash flow are equal to the dividends per share that Value Line forecasts. For the intermediate years of the forecast period in which Value Line does not provide a specific dividend, the annual dividends were obtained by estimating that dividend growth would persist at a compound annual rate. The cash flow at the end of the forecast period consists of both the last year's dividend forecast by Value Line, and the proceeds from the sale of the stock. The stock price used to determine the proceeds from selling the stock was obtained by estimating that the stock price would grow at the same rate at

Q. which Value Line forecasts book value to grow. **Why did you use book value growth to provide the estimate of the future stock price?**

A. For any given earned return on book equity, earnings are directly proportional to the book value. Furthermore, book value growth is the net result after the company

produces earnings, pays a dividend and also, perhaps, either sells new common stock at market price or repurchases its own common stock at market price.

Once these cash flows are entered into an Excel spreadsheet, the compound annual return an investor would achieve as a result of making this investment was obtained by calculating the Internal Rate of Return (IRR).[30] This multi-stage DCF model produced an average indicated COE of 8.02 percent based on the year-end stock price, and 8.29 percent based on average prices for the year ending June 30, 2026 for the Bulkley Proxy Group as shown on Rothschild, Exhibit ALR-4 at 3 and Exhibit ALR-4 at 4.

Q. What cost of equity does your non-constant growth DCF method indicate?

A. My non-constant growth DCF method indicates a cost of equity of between 8.02 percent and 8.29 percent.[31]

E. Capital Asset Pricing Model

Q. Please describe the CAPM.

A. CAPM stands for "Capital Asset Pricing Model." The CAPM relates return to risk; specifically, it relates the expected return on an investment in a security to the risk of investing in that security. The riskier the investment, the greater the expected return (i.e., the cost of equity) investors require to make that investment.

Investors in a firm's equity face two types of risks: (1) firm-specific risk and (2) market risk (financial analysts refer to this market risk as systematic risk).

[30] The IRR is the rate of return that an investment is expected to generate. On the other hand, the cost of capital is the minimum return an investment needs to make for it to be worthwhile.

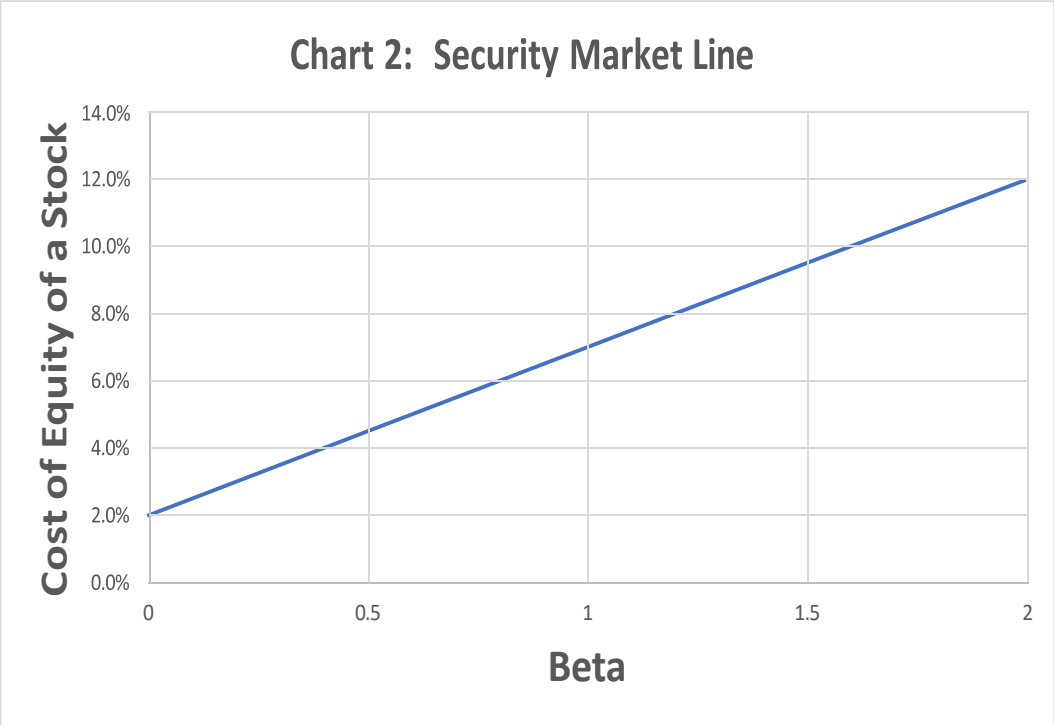
[31] Rothschild, Exh. ALR-4 at 3–4 (Discounted Cash Flow).

Firm-specific risk refers to risks unique to the firm, such as management performance and losing market share to a new competitor. Investors can reduce firm-specific risk by purchasing stocks as part of a diverse portfolio of companies if they construct the portfolio to cause the firm-specific risk of individual companies to balance out. Market-related risk refers to potential impacts from the overall market, such as a recession or interest rate changes. This risk cannot be removed by diversification, so the investor must bear it no matter what. Since the investor has no option but to bear market risk, the investor's cost of equity will reflect that risk.

The price of a stock with a beta of 1 tends to move with the market. If the market increases by one percent, the stock is also expected to increase by about one percent, and vice versa. The price of a stock with a beta greater than one tends to be more volatile than the market. For example, a stock with a beta of 1.5 will, on average, be 50 percent more volatile than the market. If the market rises by one percent, the price of a stock with a beta of 1.5 is expected to rise by 1.5 percent, and if the market falls by one percent, the stock price is expected to decrease by 1.5 percent. The price of a stock with a beta less than one tends to be less volatile than the market.

The CAPM predicts that for a given equity security, the cost of equity has a linear relationship with how sensitive the stock's returns are to movements in the overall market (e.g., S&P 500). A security's market sensitivity is measured by its beta. As shown in Figure 2, the higher the beta of a stock, the higher the company's cost of equity—the return required by the investor to invest in the stock.

Figure 2: Security Market Line



Here is the standard CAPM formula:

$$K = Rf + \beta i * (Rm - Rf)$$

Where:

K is the cost of equity;
Rf is the risk-free interest rate;
Rm is the expected return on the overall market (e.g., S&P 500);
[Rm – Rf] is the premium investors expect to earn above the risk-free rate for investing in the overall market (equity risk premium or market risk premium); and βi (Beta) is a specific asset's share of non-diversifiable, or systematic, risk.

Q. Please explain how you implemented the CAPM.

A. First, I determined appropriate values or ranges for each of the three model inputs: (a) Risk-Free Rate, (b) Beta, and (c) Equity Risk Premium. Second, I used the equation above to calculate the cost of equity implied by the model. Below, I will

explain how I calculated the three model inputs and summarize the CAPM cost of equity numbers resulting from those inputs. Table 6 and Table 7 on page 49 show the results of my CAPM.

F. Risk-Free Rate

Q. What risk-free rate did you use in your CAPM?

A. It is generally preferable to use the market yield on short-term U.S. Treasury securities as the risk-free rate because these assets have a beta close to zero. *Principles of Corporate Finance* states, "The CAPM… calls for a short-term interest rate."[32] I chose to use a risk-free rate based on both long- and short-term Treasury yields, however, because, as indicated by the recent yield curve,[33] investors with a longer investment horizon would likely use a higher risk-free rate as an opportunity cost for their investment decisions. It is commonplace in utility rate case proceedings to consider a risk-free rate based on long-term investments. My short-term risk-free rate is based on the yield of 3-month U.S. Treasury bills and my long-term risk-free rate is based on the yield of 30-year U.S. Treasury bonds. In line with my Spot and Weighted Average CAPM approaches, I use both spot values as of June 30, 2026 and weighted averages over the 3 months ending on that date for these two yields.

As outlined in Rothschild, Exhibit ALR-4 at 2, my spot and weighted average short-term risk-free rates are 3.87 percent and 3.76 percent, respectively.

[32] Richard Brealey, Stewart Myers, & Franklin Allen, *Principles of Corporate Finance*, at 228, (McGraw-Hill Irwin, New York, 12th ed. 2017).

[33] The yield curve on U.S. Treasury bonds relates the yield to its time to maturity.

My spot and weighted average long-term risk-free rates are 4.91 percent and 4.95 percent, respectively.

U.S. government bonds are reasonable to use as a risk-free rate because they have a negligible risk of default. The value of short-term U.S. Treasury bills is their relatively low exposure to swings in the overall market. The value of long-term U.S. Treasury bonds is relatively more exposed to the market and therefore must be used with caution.

Q. What is your response to analysts who claim that the CAPM should be implemented with a risk-free rate based on a long-term interest rate (e.g., yield on 30-year treasury bond) and/or based on interest rate forecasts instead of market yields.

A. As discussed in Section V.E, a CAPM analysis that uses a risk-free rate based only on long-term interest rates may overstate the COE because these bonds do not have a zero beta. It is not appropriate to use a risk-free rate based on interest rate forecasts because it often does not represent investors' expectations.

G. Beta

Q. What beta did you use in your CAPM?

A. Since the cost of equity should be based on investor expectations, I chose to use two betas. My "forward beta" is based on forward-looking investor expectations of non-diversifiable risk. My "historical blended" beta is based on historical return data over six-month, two-year, and five-year periods.

Most published betas are based exclusively on historical return data. For example, Value Line publishes a five-year historical beta for each of the companies

it covers. However, it is also possible to calculate betas based on investors' expectations of the probability distribution of future returns. This probability distribution of future returns expected by investors can be calculated based on the market prices of stock options.

Q. What is a stock option?

A. A stock option is the right to buy or sell a stock at a specific price for a specified amount of time. A call option is the right to buy a stock at a specified exercise or strike price on or before a maturity date. A put option is the right to sell a stock at a specified exercise or strike price on or before a maturity date. For example, a call option to purchase 100 shares of Apple Computer stock for $230 on January 17, 2020, allows the owner the option (not the obligation) to buy Apple stock for $230 on that date. At the end of July 2019, Apple stock was trading at about $215 per share. Why would anyone pay for the right to buy a stock higher than the current price? Investors who purchased those call options thought there was a chance Apple stock would be trading higher than $230 on January 17, 2020, and those options gave those investors the right to buy Apple stock for $230 and profit by selling it at the market price on that date, if it was higher. The price of Apple's stock was $317.98 at the close of trading on January 17, 2020. Therefore, the investor who purchased this call option for $635 on July 31, 2019, earned a profit of $8,163[34] at expiry on January 17, 2020. On the other hand, the investor who purchased an

[34] $8,163 profit from exercising call option ($31,798 from selling at $317.98 market price - $23,000 cost to purchase at $230) - $635 ($6.35 X 100) option purchase price. Note: Each call option is the right to purchase 100 shares.

Apple put option with the same expiration date and strike price on July 31, 2019, would have lost the price of the option ($2,248) and gained nothing on the expiration date because the right to sell Apple stock for $230 when the price is over $300 is worthless.

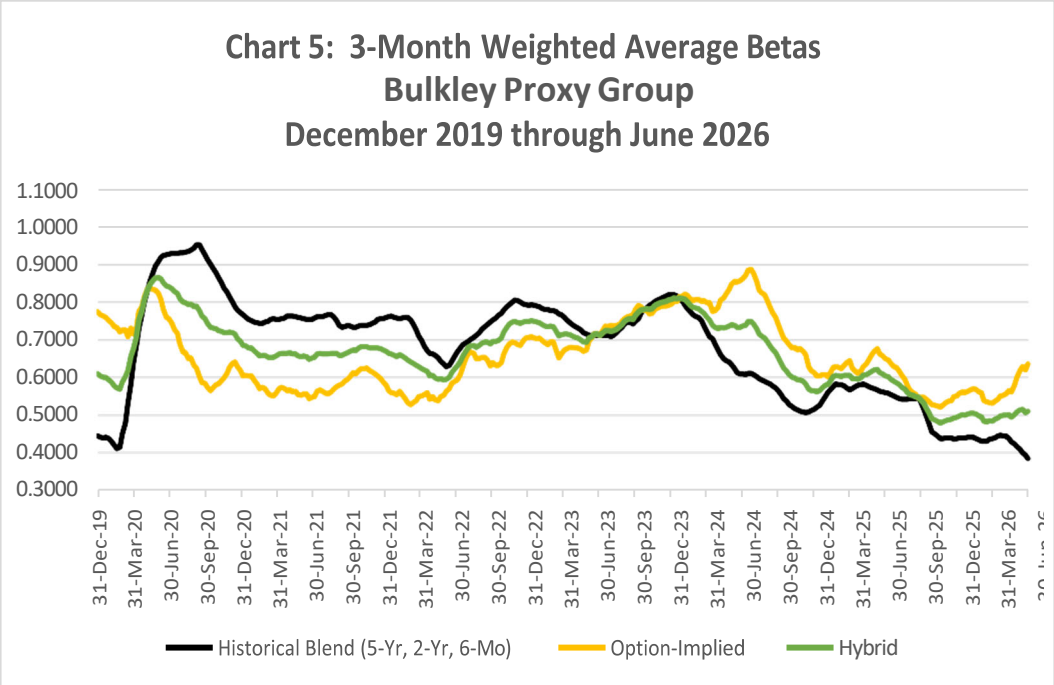
The market prices of put options and call options provide information regarding the probability distribution of future stock prices expected by investors. Using established techniques—specifically, applying the exact calculation methodologies the Chicago Board of Options Exchange (CBOE) uses for its VIX and SKEW indices, combined with peer-reviewed formulas for option-implied beta—I am able to use price data for the stock options of the Bulkley Proxy Group companies and the S&P 500 Index to determine investors' return expectations, including the relationship (covariance) between the return expectations for individual Bulkley Proxy Group companies and those for the overall market (S&P 500). This covariance between the expected returns for the Bulkley Proxy Group and for the S&P 500 indicates what investors expect betas will be in the future. I refer to betas based on option price calculations as "option-implied betas."

Q. Please explain how you calculated the betas used in your CAPM.

A. Traditionally, the betas used in CAPM calculations are calculated from historical returns. This approach has strengths and weaknesses. An alternative way to calculate betas is to incorporate investors' return expectations by calculating option-implied betas as explained in the previous paragraph. As discussed below, I have chosen to use both historical and option-implied betas in my CAPM analysis. I chose to use option-implied betas in my CAPM analysis because, among other

reasons, studies have found that betas calculated based on investor expectations (option-implied) provide information regarding future perceived risks and expectations.[35] Because the cost of equity is fundamentally a forward-looking, market-based concept, incorporating these option-implied expectations yields CAPM results that are much closer to PSE's true market-based cost of equity. Consequently, it ensures that any ROE recommendation based on this method accurately reflects the real-time requirements of the broader market rather than relying solely on backward-looking data.

Figure 3: 3-Month Weighted Average Betas Bulkley Proxy Group December 2019 through June 2026



[35] Bo-Young Chang, Peter Christoffersen, Kris Jacobs, & Gregory Vainberg, *Option-Implied Measures of Equity Risk*, *Review of Finance*, at 385-428 (Vol. 16, Iss. 2, April 2012), https://academic.oup.com/rof/article/16/2/385/1584560.

As shown in Figure 3 on page 38, stock option prices indicate that investors likely expect lower betas for the Bulkley Proxy Group in the future.

Rothschild, Exhibit ALR-4 at 3 contains the last three months of data used in creating Figure 3 on page 38, which is what I use in my CAPM analysis. Specifically, I use the following two betas in my CAPM analysis:

1. **Historical Blend:** 50% (6 months) + 30% (2 years) + 20% (5 years).
2. **Forward Beta:** 100% Option-Implied Beta (6 months).

Q. Why do you use periods of six months, two years, and five years for your historical beta calculations, as opposed to relying exclusively on the five-year period used by Value Line?

A. Using shorter periods for the return regression analysis portion of the historical beta calculation allows me to see if the correlation between the returns of each of the companies in the Bulkley Proxy Group and those of the S&P 500 Index has changed in the last two years or six months. Using a five-year period exclusively tends to make recent changes in the correlation more difficult to identify because of the weight of five years of data.

Q. Would you agree that changes in market dynamics will have a larger effect on six-month historical betas than they will on two-year or five-year historical betas?

A. Yes. As with other historical metrics based on a given time period, say, average stock prices, the longer the time horizon under consideration, the more data points are considered, and the smaller the effect of any one given change in the data set.

Q. Is this larger effect on six-month historical betas from changes in market dynamics a good or a bad thing?

A. The answer depends on what the beta will be used for. I would argue that in any attempt to forecast the beta coefficient of a company for any near-term forward-looking analysis, such as the cost of capital calculations in this proceeding, more recent historical data should be given more relevance than data from five or 10 years ago. The weight of 10 years of data makes a beta coefficient react extremely slowly to market developments. Even pronounced permanent market changes can take more than six months to have a detectable effect on a 10-year beta.

As with using spot values and averages of historical market data, I believe the right answer is not to use *either* six-month historical betas or historical betas with longer horizons, but to consider *both*. For this reason, I have created my historical blended betas, which take into consideration six-month, two-year, and five-year historical betas.

Q. Do you think it is a good idea to rely on six-month historical betas despite market developments in the past year that some would call "market dislocations?"

A. Financial markets are constantly in flux due to the influence of countless factors. So-called "market dislocations," are just some of the numerous factors that are constantly affecting markets. To attempt to separate any one specific factor from "real" underlying market dynamics would be an exercise in futility.

Furthermore, predicting the duration and impact of any single influencing factor on financial markets is extremely challenging, if not impossible. In 2008,

when interest rates plummeted to unprecedented lows, numerous analysts deemed this a temporary anomaly. Contrary to these expectations, rates not only persisted at these low levels for more than ten years but dropped even further in response to the unforeseen COVID-19 pandemic, which significantly affected the global economy and financial markets.

So, in response, yes, I think it is a good idea to use six-month historical betas to measure recent and current market dynamics regardless of recent developments. I use them as part of my historical blended betas in conjunction with longer-term historical betas and forward-looking, option-implied betas to achieve the most reasonable result.

Q. Given the shorter period covered by six-month historical betas, can they still be considered statistically significant? How many data point pairs are used in the calculation of your six-month historical beta coefficients?

A. A six-month historical beta based on weekly returns, calculated weekly, incorporates 26 closing price points for a company and for its corresponding market index, in this case the S&P 500 Index. This translates into 25 pairs of return data that are then used in the regression analysis. This is most certainly enough data to achieve statistical significance, as addressed further below.

Furthermore, as stated above, the recent improvement in my calculation of historical betas by using weekly returns on every day of the week as opposed to using only one day of the week, as Value Line does, has the added benefit of providing significantly more data pairs to be used in the regression analysis used to

calculate beta. For six-month historical betas, instead of relying on 25 return pairs, my regression is performed on 117 return pairs.

Q. Please explain how you calculated option-implied betas.

A. Calculating option-implied betas of a company requires (1) obtaining stock option data for that company and a market index, (2) filtering the stock option data, (3) calculating the option-implied volatility for the company and for the index, (4) calculating the option-implied skewness for the company and for the index, and (5) calculating option-implied betas for the company based on implied volatility and skewness for the company and for the index. There are various ways one could choose to perform the steps above, but I chose to filter stock option data and calculate option-implied volatility[36] and skewness[37] following exactly the same methodology used by the Chicago Board of Options Exchange (CBOE) in the calculation of their widely-used VIX (or Volatility Index) and SKEW Index, respectively.

I start my process with publicly available trading information for all the options for a given security (company or index) for a complete trading day. I then filter the option data as described by the CBOE using the following guidelines:

1. Use the mid-quote or mark (average of bid and ask) as the option price.

[36] Michael Mollet & John White, *Cboe Interest Rate Swap Volatility Index (SRVIX) White Paper*, CBOE Applied Academics (2018), https://cdn.cboe.com/resources/indices/srvix-white-paper.pdf. Please note that the cover page says, "proprietary information." However, this document has been in the public domain for over three years.

[37] *The CBOE SKEW Index White Paper*, CBOE (2010), https://cdn.cboe.com/resources/indices/documents/SKEWwhitepaperjan2011.pdf. Please note that the cover page says, "proprietary information." However, this document has been in the public domain for over three years.

2. Use only out-of-the-money call and put options.

- Determine the "moneyness" threshold where absolute difference between call and put prices is smallest (using CBOE "Forward Index Price" formula).
- Include "at-the-money" call and put options and use average of call and put prices as price for "blended" option.

3. Exclude all zero bids.

4. Exclude remaining (more out-of-the-money) options when two sequential zero bids are found.

I then apply the series of formulas clearly described in both of the CBOE's white papers to the remaining options to calculate Option-Implied Volatility and Option-Implied Skewness. In the words of the CBOE, each of its two indices is "an amalgam of the information reflected in the prices of all eligible options. Finally, I calculate the option implied betas using the following formula developed by Christoffersen, Chang, Jacobs and Vainberg (2011):[38]

$$\beta_i = \left(\frac{SKEW_i}{SKEW_m}\right)^{1/3} \quad \left(\frac{VAR_i}{VAR_m}\right)^{1/2}$$

Where:

β_i: $option-implied\ beta\ of\ security\ (e.g. stock, fund)$;
$SKEW_i$: $skewness\ of\ security$;
$SKEW_m$: $skewness\ of\ overall\ market\ (S\&P\ 500)$;
VAR_i: $variance\ of\ security$;
VAR_m: $variance\ of\ overall\ market\ (S\&P\ 500)$.

Q. You calculate your option-implied betas based on a six-month horizon. Would it not be better to use a longer forecasting horizon?

A. The methodology I use to calculate my option-implied betas "allows for the computation of a complete term structure of beta for each company so long as the options data are available,"[39] so there is nothing inherent in the methodology that limits it to a certain time horizon.

For many applications, including cost of capital, one could argue that the longer the time horizon for the option-implied betas, the better. However, the limitation on the forecasting horizon is always set by the longest expiration period of the options currently traded in the market. Some companies trade options with expiration periods up to two or three years into the future. As evidenced by the exhaustive option data in my workpapers, the maximum expiration period for the options of the companies in the Bulkley Proxy Group is approximately eight months. None of the 19 companies ever trade options with expiration periods of more than eight months. New options are issued roughly every three months for all of these companies, so the maximum expiration period on any given trading day is somewhere between five and eight months. For consistency across companies in the Bulkley Proxy Group and across dates within the three-month period on which my analysis is focused (April through June 2026), I chose to use six months for the time horizon of my option-implied betas. If the maximum expiration period for the

[38] Bo-Young Chang, Peter Christoffersen, Kris Jacobs & Gregory Vainberg, *Option-Implied Measures of Equity Risk*, *Review of Finance,* at 385–428 (Vol. 16, Iss. 2, April 2012), https://academic.oup.com/rof/article/16/2/385/1584560.
[39] Peter Christoffersen, Kris Jacobs, and Gregory Vainberg, *Forward-Looking Betas*, at 24 (April 25, 2008) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=891467.

options of a given company on a given day is less than six months, I use the maximum expiration period as an approximation for the target six-month horizon.

Simply because some may argue that it may be preferable to use longer time horizons in place of or in addition to a six-month horizon, it does not mean that a six-month option-implied beta is of no relevance or cannot be used. That would be tantamount to saying you cannot use a one-year Value Line Earnings Per Share estimate, or that the minimum relevant forecast is two or three years. In fact, for purposes of option-implied betas, it would be difficult to say if a time horizon of one year, for instance, is necessarily always better than a time horizon of six months. An option-implied forward-looking beta, even with a time horizon of less than six months, is still a useful tool in interpreting the current expectations of investors at any given time. This is why it is one of the many tools I consider when arriving at my recommendations.

A final strong argument in support of using six-month option-implied betas in a cost of capital calculation looking years into the future is that the authors of the paper[40] on which I based my option-implied betas concluded that their predictive powers are not limited to six months into the future.[41] In fact, they conclude that six-month option-implied betas have stronger predictive power than six-month, one-year, or five-year historical betas when attempting to forecast betas one or two years into the future.

[40] *Id.*
[41] This is further expanded upon in my testimony, Rothschild, Exh. ALR-1T at 124.

H. Market Risk Premium

Q. Please explain how you calculated the Equity Risk Premium used in your CAPM.

A. Traditionally, the risk premium used in CAPM calculations is derived from historical returns and/or equity analyst projections. The former approach is historically accurate but does not take into account investors' expectations for future market risks and returns. The latter approach is based on analyst projections, which are not appropriate since they may not reflect current investor expectations. For instance, extensive research by McKinsey & Company has demonstrated that equity analysts have been persistently overoptimistic for decades and are typically slow to revise their forecasts to reflect new economic conditions. In contrast, actual capital markets, representing the true expectations of investors with capital at risk, are "notably less giddy in their predictions" than the analysts forecasting their growth.[42] A superior market-based way to calculate the equity risk premium is to use option-implied return expectations, which is the approach I have used.

My equity risk premium is the expected return on the S&P 500 minus the risk-free rate. I calculate an expected return on the S&P 500 by using stock options traded on this index. To begin with, I use exactly the same methodology used by the Chicago Board of Options Exchange to filter stock option data and calculate option-implied volatility and skewness,[43] as described in detail in the Beta section

[42] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, *Equity analysts: Still too bullish*, McKinsey & Co. (Apr. 1, 2010), https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/equity-analysts-still-too-bullish.
[43] As used in the calculation of their widely-used VIX (or Volatility Index) and SKEW Index, respectively.

on page 42. The volatility and skewness calculated in this way describe a probability distribution representing the possible trajectories for the S&P 500 implied by the options market. The resulting skewed probability distribution can be closely approximated by a log-normal distribution using established statistical formulas, which then make it straightforward to calculate the expected growth for the S&P 500 for any given cumulative probability. A cumulative probability of 50 percent represents the median of the probability distribution, or the option-implied market consensus, which is how I arrive at my calculation of expected market growth.

Once the option-implied growth rate of the S&P 500 has been estimated as described above, I add the dividend yield and subtract the risk-free rate to arrive at the market risk premium, as laid out in Rothschild, Exhibit ALR-4 at 4 and 6. In line with my Spot and Weighted Average CAPM approaches, I use both spot values as of June 30, 2026 and weighted averages over the three months ending on that date for option-implied growth, dividend yields, and short- and long-term risk-free rates in these calculations to arrive at a total of four estimated values for the market risk premium. The market risk premia I use in my Weighted Average CAPM analysis with short- and long-term risk-free rates are 4.95 percent and 3.76 percent, respectively. The market risk premia I use in my Spot CAPM analysis with short- and long-term risk-free rates are 4.35 percent and 3.31 percent, respectively.

Q. Did you take into consideration the difference in volatilities across expiration periods in the options traded on the S&P 500?

A. Yes. The volatility implied by the options market changes over time as investors' perception of risk changes. For example, during a crisis, implied volatility generally increases as investors expect that stock market prices have a greater chance of large swings compared to times when there is no crisis. As discussed earlier, investors also often have different volatility expectations over different time periods. For example, on any given day, investors might expect volatility to be relatively high over the next 30 days and to decrease over the next year or longer. The same holds true for skewness, even though it is less intuitive to understand changes in skewness than in volatility. Briefly, skewness measures the asymmetry of the market's return expectations, specifically indicating whether investors perceive a greater probability of extreme downside losses compared to outsized gains. Because of these changes across option expiration periods, I take a weighted average of the entire term structure of the option-implied volatility and skewness, which for the S&P 500 typically goes out to 54 to 61 months[44], interpolating where necessary, and giving the most weight to the option expiration period of 12 months.

[44] Prior to November 2021, the longest expiration period for stock options traded on the S&P 500 was 36 months.

VI. CAPM Results

Q. Please summarize the results of your CAPM.

A. Table 6 and Table 7 below show the results of my Weighted Average CAPM and Spot CAPM Analyses, respectively.

Table 6: Capital Asset Pricing Model (CAPM) – Indicated Cost of Equity

TABLE 6: CAPITAL ASSET PRICING MODEL (CAPM) - INDICATED COST OF EQUITY
WEIGHTED - All Inputs Weighted From April to June 2026

	3-Month Treasury Bill		30-Year Treasury Bond	
	Historical Blended Beta	Forward Beta	Historical Blended Beta	Forward Beta
Risk-Free Rate	3.76%	3.76%	4.95%	4.95%
Beta	0.38	0.64	0.38	0.64
Risk Premium	4.95%	4.95%	3.76%	3.76%
CAPM	5.67%	6.91%	6.40%	7.35%

Source: Exhibit ALR-4, page 1

Table 7: Capital Asset Pricing Model (CAPM) – Indicated Cost of Equity (Spot)

TABLE 7: CAPITAL ASSET PRICING MODEL (CAPM) - INDICATED COST OF EQUITY (SPOT)
SPOT - All Inputs Based on Last Available Data as of June 30, 2026

	3-Month Treasury Bill		30-Year Treasury Bond	
	Historical Blended Beta	Forward Beta	Historical Blended Beta	Forward Beta
Risk-Free Rate	3.87%	3.87%	4.91%	4.91%
Beta	0.34	0.71	0.34	0.71
Risk Premium	4.35%	4.35%	3.31%	3.31%
CAPM	5.37%	6.96%	6.05%	7.26%

Source: Exhibit ALR-4, page 5

As shown in Rothschild, Exhibit ALR-13, the results of my CAPM analysis applied to the Bulkley Proxy Group demonstrate how the cost of equity has evolved since the onset of the COVID-19 pandemic. The cost of equity briefly spiked in early 2020 but then declined as markets stabilized. Most importantly, since peaking at about 9.25 percent in November 2022, the CAPM-implied cost of equity for the proxy group has been on a clear downward trend, falling to under seven percent by August 2025.

As detailed earlier in my testimony, my primary ROE recommendation of 8.17 percent for PSE is derived directly from applying the DCF and CAPM methodologies to a proxy group of comparable regulated utility companies. Specifically, the Constant and Non-Constant Growth DCF models, alongside eight variations of the CAPM, produced an initial range of 5.37 percent to 8.73 percent. After applying a statistical filter to mitigate short-term market distortions, this resulted in a refined, utility-specific COE band of 8.03 percent to 8.55 percent. While this proxy group analysis forms the exclusive basis for my 8.17 percent recommendation, the following section evaluates the COE for the overall market. This broader market analysis is not used to calculate PSE's specific rate, but rather provides essential economic context. It serves as a benchmark for reasonableness, reinforcing the fundamental financial principle that a regulated monopoly like PSE carries inherently lower risk, and therefore requires a lower return, than the competitive companies comprising the broader market.

VII. MARKET COE (S&P 500 CONTEXT)

Q. How does your COE calculation for the overall market relate to your 8.17 percent ROE recommendation?

A. My COE for the overall market serves as context for the appropriate ROE for PSE. To ensure a clear distinction throughout this section, I will refer to the cost of equity for the overall market (represented by the S&P 500) as the "market COE." My 8.17 percent recommendation is grounded in a fundamental economic boundary: a low-risk, regulated monopoly utility cannot logically require a higher return than the riskier overall stock market.

Using forward-looking options data, I calculated the COE for the S&P 500 to be between 7.46 percent and 9.34 percent, with a midpoint of 8.40 percent. I provide this analysis to offer direct insight into what current capital markets are indicating regarding the COE for the market as a whole. It is critical to emphasize that this market COE should not be interpreted as the COE applicable to PSE or any utility company. Rather, it establishes the essential economic context proving that my 8.17 percent utility-specific recommendation appropriately reflects PSE's lower risk profile.

I provide this analysis to offer direct insight into what current capital markets are indicating regarding the market COE for the market as a whole.

Q. How did you calculate market COE?

A. I calculated the COE for the S&P 500 by using a DCF model. I used the prices of stock options traded on the S&P 500 to derive an option-implied growth rate. As discussed above, a stock option is a financial contract giving the holder the right to

buy or sell a security at a specified price within a set timeframe, and they are useful for calculating the COE because their market prices reflect the probability distribution of future stock prices, allowing for the derivation of investors' expectations. Please see Rothschild, Exhibit ALR-15 for a discussion of how I calculated the option-implied growth rates.

Q. What option-implied growth rates did you calculate?

A. I calculated investors' growth expectations over three different investment time horizons—one year, three years, and five years—based on stock option prices. Because stock options are traded with various expiration dates, they allow us to analyze the term structure of the COE. This concept recognizes that the return investors require can vary depending on the time horizon of the investment.

The resulting option-implied growth rates can be summarized as follows:

1-Year Horizon: 7.91% to 8.72%

3-Year Horizon: 7.64% to 7.75%

5-Year Horizon: 6.44% to 6.80%

To move from the "term structure" of growth to the term structure of the COE, I added the dividend yield of the S&P 500, which was approximately 1.1 percent for the three-month period upon which the analysis was based. This results in the COE for the overall market.

Q. What are the results of your DCF COE analysis?

A. The results of our DCF models applied to the S&P 500 range between 7.46 percent and 9.34 percent. To properly interpret these results, it is critical to understand that they vary across two distinct dimensions: the investment horizon, or the time period

over which the return is measured, and the date of analysis, which in this case comprises the market conditions averaged over the three-month period April through June 2026.

Q. Please explain how the COE results vary across these dimensions.

A. My analysis reveals a dynamic term structure where COE expectations shift depending on how far into the future we look.

The resulting option-implied COE can be summarized as follows:

1-Year Horizon: 8.72% to 9.34%

3-Year Horizon: 8.78% to 8.90%

5-Year Horizon: 7.46% to 7.96%

Generally speaking, there is a declining trend as one goes out from short-term to longer-term horizons.

Q. Why didn't you calculate the COE beyond the five-year time frame?

A. It is not possible to calculate an option-implied COE beyond the five-year horizon because a consistent market for such options does not exist. Publicly traded index options occasionally trade out to six years for a brief period, but are only available consistently out to about five years.

Q. What conclusion do you draw from this declining trend?

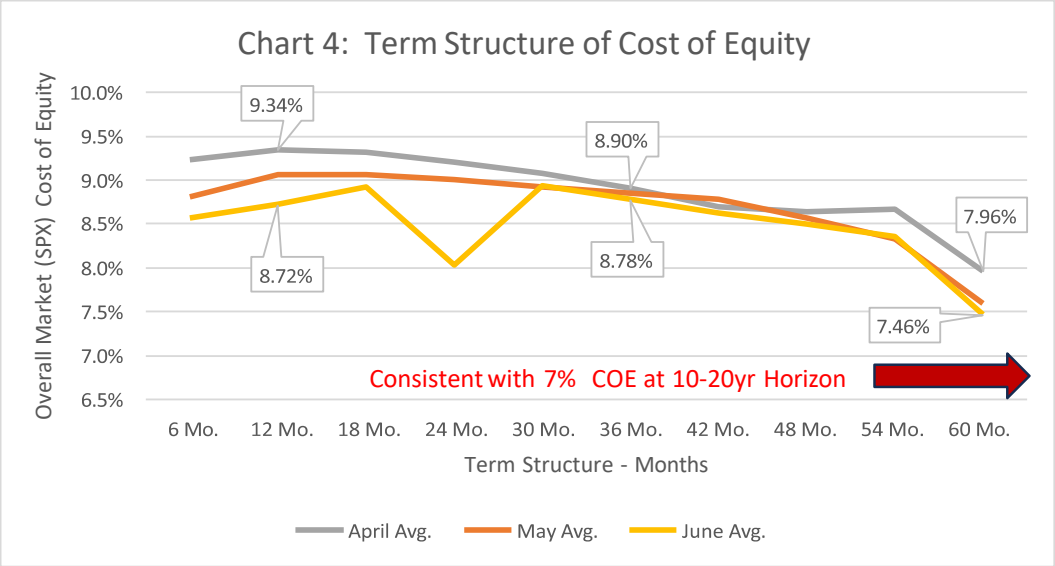
A. The data indicates that while short-term market expectations have risen in recent months, longer-term expectations remain anchored at lower levels.

This is significant because, for utility ratemaking purposes, the longer horizons are arguably the most relevant. While rates are set periodically, the cost of equity (COE) represents the return required to attract capital for long-lived

assets. Because the primary investors in this sector, such as pension funds, match their investments to long-term liabilities, they price these securities based on a multi-decade horizon rather than shorter investment horizons.

As shown in Figure 4 below, as we extend the timeline out to five years, the COE indicated by our stock option analysis is consistent with the longer-term forecasts of major financial institutions. Specifically, even the highest COE results in Figure 4 decline from 8.72 percent to 9.34 percent at the one-year horizon to 7.46 percent to 7.96 percent at the five-year horizon, trending directly toward the 10-to-20-year forecasts from firms like J.P. Morgan (6.7 percent) and the Horizon Actuarial Survey (approximately 7.0 percent), as shown in Table 3 on page 9. As discussed above, the Horizon survey is a significant industry benchmark that aggregates the capital market assumptions of 41 different investment advisory firms, including the Bank of New York Mellon, BlackRock, and Goldman Sachs.

Figure 4: Term Structure of Cost of Equity



While this market-wide COE analysis does not serve as my specific ROE recommendation for PSE, it provides essential context for the broader financial landscape. The fundamental premise of utility regulation is that a monopoly provider—insulated by captive customers and ratepayer-funded cost-recovery mechanisms—is inherently less risky than the competitive, diversified companies that make up the S&P 500. Therefore, the cost of equity for a regulated utility like PSE must necessarily fall below the return required by the broader market. Figure 4 above demonstrates that near-term market expectations for the S&P 500 center around a midpoint of 8.40 percent, stretching up to as high as 9.34 percent, before trending toward seven percent over longer horizons. My primary recommendation of 8.17 percent properly reflects PSE's reduced risk profile by falling firmly below this market benchmark. Conversely, a request of 10.80 percent defies this foundational financial principle by demanding a return far above what investors require for the riskier, competitive market.

VIII. CAPITAL STRUCTURE AND COST OF DEBT

Q. Is PSE's requested capital structure consisting of 50.00 percent common equity appropriate?

A. No. PSE's requested capital structure is not appropriate for setting rates in this proceeding because its 50.00 percent common equity ratio is significantly higher than how capital is actually raised in the market. Because PSE's parent company (Puget Energy) is privately held and lacks publicly available capital structure data, we must look to the holding company level of the 19 electric and natural gas companies in our proxy group to determine the true market standard.

At the holding company level—which provides a direct view into how these entities actually raise capital—the proxy group has an average common equity ratio of only 41.7 percent (excluding short-term debt)[45]. PSE's request of 50.00 percent is vastly inflated compared to this market reality.

Therefore, I recommend a capital structure with a 44.00 percent common equity ratio. I chose 44.00 percent specifically because PSE is required to maintain at least a 44.00 percent common equity ratio as part of its 2009 acquisition commitments. This recommendation ensures the utility satisfies its binding regulatory obligations and provides a reasonable cushion above the proxy group's 41.7 percent average, while protecting ratepayers from the excess costs associated with PSE's inflated 50.00 percent request.

Q. Why is it appropriate to rely on the capital structure at the holding company level rather than the operating subsidiary level?

A. Looking at the holding company level is the most economically sound approach because it reflects how capital is actually secured in the financial markets. Investors purchase the equity and debt of the consolidated holding company, making it the true indicator of market-demanded capital proportions.

Furthermore, relying on holding company data ensures methodological consistency—a standard Ms. Bulkley fails to meet. Throughout her testimony, Ms. Bulkley relies entirely on holding company market data (such as stock prices, dividend yields, and betas) to calculate her Cost of Equity models, correctly noting

[45]Rothschild, Exh. ALR-6 at 5 (Proxy Group).

that operating subsidiaries do not trade publicly. However, when justifying PSE's capital structure, she abandons this holding company data and drills down strictly to the regulated operating subsidiaries to artificially support a higher equity ratio.

While it is generally the case that if holding company data dictates the cost of equity, holding company data should also inform the proportions of that equity, I recognize that there can be exceptions. A regulated subsidiary could theoretically provide evidence to reasonably argue for a capital structure with a higher common equity ratio than its parent holding company. However, PSE has not provided any evidence to justify such a divergence in this case. I remain open to reviewing such evidence if it is presented, but absent that empirical justification, relying on the holding company capital structure remains the most accurate and appropriate benchmark.

Q. What is the impact of adopting Ms. Bulkley's recommended capital structure?

A. It can be overlooked that the authorized capital structure can have a large impact on the utility company's revenue requirement.

My recommendations, including my capital structure recommendation, result in an overall rate of return of 6.56 percent as shown in Table 1 on page 6. Ms. Bulkley's recommendations result in an overall rate of return of ~~8.22~~ 8.04 percent. If the Commission adopts an equity component of the capital structure ratio that is higher than I have recommended, there should be a corresponding reduction to ROE, which would result in a reduced ROR.

If the Company witnesses' capital structure recommendations are adopted, it is important to make an adjustment to the overall ROR to account for the financial

risk difference between her capital structure recommendation and that of the companies in the Bulkley Proxy Group, which have a significantly lower average common equity ratio (mean of 41.7 percent and median of 41.9 percent)[46] than the common equity ratios recommended by Ms. Bulkley. A higher common equity ratio means less debt, a lower chance of financial stress (financial risk), and therefore a lower COE. On the other hand, a lower common equity ratio means more debt, a higher chance of financial stress (financial risk), and therefore a higher COE. Based on a regression analysis of dozens of utility companies, I found a 0.04 percent reduction in the COE results from every one percent increase in the common equity ratio.[47] Therefore, if the Commission authorizes a capital structure with a higher common equity ratio for a specific applicant, then the authorized ROE for that applicant should be reduced by 0.04 percent for every one percent its authorized common equity ratio exceeds that of the proxy group.

If my 8.17 percent ROE recommendation is combined with Ms. Bulkley's requested 50.00 percent capital structure—rather than my recommended 44.00 percent capital structure—PSE's revenue requirement would be approximately ~~$48.9~~$42.1 million higher than under my primary recommendation. This ~~$48.9~~$42.1 million figure isolates the excessive cost burden placed on consumers strictly by Ms. Bulkley's inflated equity ratio. This unjustified cost is even more apparent when compared to the actual capital structures of the 19 electric and natural gas companies analyzed by both Ms. Bulkley and myself, which have an average

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[46] *Id.*
[47] Supporting calculations for this analysis are available upon request.

common equity ratio of only 41.7 percent (and a median of 41.9 percent) at the holding company level.

Q. What Cost of Debt do you recommend?

A. I recommend adopting PSE's requested cost of debt of 5.33%.

IX. EVALUATION OF PSE'S RATE OF RETURN TESTIMONY

Q. Please summarize the testimony of Ms. Bulkley.

A. Ms. Bulkley supports an authorized ROE of 10.8 percent for PSE for each of the three rate years of PSE's proposed multiyear rate play (MYRP), based on a recommended range of 10.50 percent to 11.50 percent, and supports PSE's proposed capital structure containing 50 percent common equity.[48]

Ms. Bulkley arrived at her 10.8 percent recommendation based on the results of:

- Constant Growth Discounted Cash Flow (DCF) Model
- Capital Asset Pricing Model (CAPM)
- Empirical Capital Asset Pricing Model (ECAPM)
- Bond Yield Plus Risk Premium (BYRP or Risk Premium) Analysis

She characterizes her 10.8 percent recommendation as "reasonable if not conservative considering the business and financial risks of PSE as compared to the proxy group."[49]

Ms. Bulkley discusses four categories of company-specific regulatory and business risk (compared to the companies in her proxy group):

[48] Bulkley, Exh. AEB-1T at 6:1–23 (filed Mar. 20, 2026).
[49] *Id.* at 6:10–13.

1. the Company's multiyear rate plan,
2. power cost adjustment mechanism (PCAM),
3. capital expenditure requirements to support CETA, and wildfire and regulator risk in Washington. [50]

Notably, she does not make any specific adjustments to her ROE recommendation based on any of these factors, stating "While I do not make specific adjustments to my ROE recommendation for these factors, I do consider them in the aggregate when determining where my recommended ROE falls within the range of the analytical results."[51]

Ms. Bulkley also discusses PSE's capital structure, comparing it to her proxy group, but does not propose any explicit changes to the company's proposed 50 percent equity ratio, saying that it "is well within the range of equity ratios of the utility operating subsidiaries of the proxy group, and, in fact, lower than the mean of the proxy group" of 53.07 percent.[52] Her testimony emphasizes that no single model should be relied upon exclusively to determine the ROE and that a blended approach is necessary to reflect market conditions and investor expectations.[53]

[50] *Id.* at 2:14–18.
[51] *Id.* at 3:5–8.
[52] *Id.* at 63:16–19.
[53] *Id.* at 45:16–21 and 46:1–8.

Table 8: Ms. Bulkley's Cost of Equity Results

TABLE 8: MS. BULKLEY'S COST OF EQUITY RESULTS	
METHOD	**Model Results**
Constant Growth DCF	9.33% - 11.76%
CAPM	11.27% - 11.45%
ECAPM	11.81% - 11.94%
Bond Yield Risk Premium - Electric	10.64% - 10.74%
Bond Yield Risk Premium - Natural Gas	10.49% - 10.59%
Ms. Bulkley's Average Cost of Equity Model Results	**9.33% - 11.94%**

[1] Ms. Bulkley's Direct Testimony, Exhibit AEB-1T, Page 68, Table 5

Q. Is Ms. Bulkley's 10.8 percent ROE market-based?

A. No. Ms. Bulkley states that the cost of equity is a "market-based concept,"[54] that it "must be estimated based on observable market data,"[55] and that "[p]roviding the opportunity to earn a market-based cost of capital supports the financial integrity of PSE, which is in the interest of both customers and shareholders."[56] But when applying her approaches, there are key places where she fundamentally fails to use market data.

For example, the market risk premium portion of her CAPM is based on analyst EPS growth rate forecasts that are as high as 62.79 percent.[57] To calculate her 13.40 percent expected market return, she relies heavily on the subjective growth forecasts of a single advisory service, Value Line. While Value Line provides a respected opinion, the opinion of a single firm is not a "market."

[54] *Id.* at 44:20.
[55] *Id.* at 44:20–21.
[56] *Id.* at 11:6–8.
[57] Bulkley, Exh. AEB-8 (filed Mar. 20, 2026).

Her reliance on equity analyst earnings forecasts and economist interest rate forecasts is problematic because she does not rely on market data nearly as much as she could. Her models are based on the speculations of individual analysts instead of the actual return expectations of the millions of investors that purchase stocks, bonds, and stock options.

In contrast, my analysis derives the expected market return directly from S&P 500 index options. This is a genuinely market-based measure because option pricing models extract the implied expected returns directly from the capital commitments of millions of investors. The S&P 500 options market is arguably the deepest, most liquid equity derivative market in the world. It routinely executes three to five million contracts with over $1.5 to $2 trillion in notional volume in a single day—frequently exceeding the dollar trading volume of the underlying 500 stocks themselves.

The pricing of these options represents the aggregate, capital-backed consensus of global institutional investors, pension funds, and market makers. By relying on a single analyst firm to establish a 13.40 percent market return, Ms. Bulkley has anchored her recommendation on a small financial island, completely divorced from the objective, capital-committed reality of the broader financial markets.

Q. Do the results of Ms. Bulkley's cost of equity models provide a reliable indication of PSE's cost of equity?

A. No. Ms. Bulkley's 10.8 percent ROE recommendation is significantly higher than PSE's market-based cost of equity. If her recommendation is used to set rates,

consumers will be significantly overcharged. Ms. Bulkley's 10.8 percent ROE recommendation is excessive largely because she abandons her own foundational definition of the cost of equity the moment she executes her calculations. While she correctly defines the cost of equity as a "market-based concept" that "must be estimated based on observable market data," her actual calculations rely heavily on the subjective growth forecasts of equity analysts rather than objective, capital-backed market data. By inserting these opinion-based inputs into her models, her resulting calculations produce an inflated, artificial return rather than a genuine market-based cost of equity.

Additionally, each of her COE models have specific issues that contribute to her unreasonably high results. First, I will address how her constant growth DCF method is unreliable because it mechanically uses analyst five-year EPS growth rates as a proxy for growth without considering the mathematical relationship between retention rates, dividend payments, and growth. A company cannot invest and grow with money it has paid out to investors as a dividend. Second, I will explain how her CAPM overstates the cost of equity by using an equity risk premium that is not reflective of investors' expectations as indicated by market data.

A. DCF Method

Q. Please describe Ms. Bulkley's DCF method.

A. As noted above, one of the cost of equity models Ms. Bulkley used to derive her 10.8 percent ROE recommendation was a variation of the Constant Growth Discounted Cash Flow (DCF) model. Her 9.33 percent to 11.76 percent results

(across her minimum, average, and maximum growth rate scenarios) were based on market data—stock prices, dividend yields and analyst growth rate projections—from her proxy group, which is the same proxy group I utilized in my cost of equity analysis. Her model is based on the mathematical formula:

$$k = \frac{D(1+g)}{P_0} + g$$

Where:

k: required return;
P_0: current stock price;
D: current dividend;
g: expected growth rate. [58]

Key Inputs and Assumptions: Ms. Bulkley used average stock prices over the following three different trading periods: 30-day, 90-day, and 180-day. She explained that this approach helps balance capturing recent market conditions while avoiding potential distortions from short-term fluctuations.[59]

Dividend Yield Adjustments: She calculated the unadjusted dividend yield using each company's annualized dividend per share as of December 31, 2025, divided by the average stock price. To account for expected dividend growth, she applied one-half of the expected annual dividend growth rate to adjust the yield upward.

Growth Rate Estimation: Ms. Bulkley used consensus analyst five-year EPS growth estimates from three sources:

[58] Bulkley, Exh. AEB-1T at 48:3–14 (filed Mar. 20, 2026).
[59] *Id.* at 49:5–13.

- Zacks Investment Research (Zacks),
- S&P Capital IQ, and
- Value Line.

Her rationale for using EPS growth was that dividend growth is ultimately dependent on earnings growth, making EPS forecasts a more reliable proxy for long-term dividend growth.

Calculation of Mean and Median Results: Ms. Bulkley computed mean and median DCF results across her proxy group using different growth rate assumptions:

- Mean High: The highest EPS growth rate estimate was combined with the expected dividend yield for each of the proxy groups.
- Mean Low: The lowest EPS growth rate estimate was used.
- Overall Mean: The average EPS growth rate from all sources was applied.

DCF Model Results: The results of Ms. Bulkley's Constant Growth DCF model are presented in Table 2 on page 52 of her testimony, showing a range of average cost of equity estimates (across 30-, 90-, and 180-day average stock prices) of 9.37 percent to 11.69 percent, with mean results that have an average between 9.85 percent and 11.44 percent. These results provided a range of DCF estimates that contributed to her overall ROE recommendation of 10.80 percent.

Q. Does Ms. Bulkley properly apply the simplified or Constant Growth DCF method?

A. No. Ms. Bulkley explains that the constant growth DCF is based on the assumption that the average growth rate for earnings and dividends is constant, the dividend payout ratio is stable, there is a constant price-to-earnings multiple, and the discount rate is greater than expected growth rate.[60]

Her DCF method contradicts her own description of how the constant growth model should be implemented, however. Her growth estimate relies on analyst five-year EPS growth forecasts.[61] The correct application of the DCF method requires that the dividend yield be computed properly, and that the growth rate used be derived from a careful study of what future *sustainable* growth in cash flow is anticipated by investors. Major financial institutions like J.P. Morgan Chase have used the sustainable growth DCF model, as I do. The approach outlined by J.P. Morgan in its long-term capital market assumptions takes a more comprehensive view, integrating multiple interrelated financial factors to build expected returns. Their methodology is designed to "tie together complex interrelationships" and ensure consistency between expected earnings, future book value, and sustainable growth rates.[62]

[60] *Id.* at 48:15–18 and 49:1–2.
[61] *Id.* at 50:5–19 and 51:1–4.
[62] J.P. Asset Mgmt., *2026 Long-Term Capital Market Assumptions - Time-Tested Projections to Build Stronger Portfolios*, at 62–63 (30th Annual Ed.), https://am.jpmorgan.com/content/dam/jpm-am-aem/global/en/insights/ltcma-2026-us-matrix_usd.pdf (last visited July 24, 2026).

In contrast to Ms. Bulkley's overly simplistic DCF approach, J.P. Morgan's framework breaks equity returns into fundamental drivers, including:

1. aggregate revenue growth,
2. earnings growth as a function of margins,
3. earnings per share (EPS) growth after accounting for dilution,
4. valuation impacts on price return, and
5. dividends as a component of total return.

This approach ensures that factors such as retained earnings, share dilution, and payout ratios remain aligned with expected book equity growth—a consideration absent in Ms. Bulkley's Expected Earnings model. As J.P. Morgan explains, these interrelationships must be considered to develop reliable estimates of future returns, whereas a simplistic reliance on analyst EPS growth forecasts (as in Ms. Bulkley's method) overlooks these complexities.[63]

Ms. Bulkley's approach may overstate or misrepresent the true cost of equity by failing to account for the broader structural dynamics that drive long-term investor return expectations. Please see Rothschild, Exhibit ALR-11 for explanation of why a future-oriented "B X R" method, which is nearly identical to the method used by J.P. Morgan, is superior to Ms. Bulkley's ~~–~~DCF method.

[63] *Id.*

B. CAPM Method

Q. Please describe Ms. Bulkley's CAPM method.

A. Ms. Bulkley explains that the CAPM method "estimates the cost of equity for a given security as a function of a risk-free return plus a risk premium to compensate investors for the non-diversifiable or 'systematic' risk of that security."[64] She says that this method is defined by the following four components:

$$K_e = r_f + \beta\,(r_m - r_f)$$

Where:

K_e	=	the required ROE for a given security;
β	=	Beta coefficient of an individual security;
r_f	=	the risk-free rate of return; and
r_m	=	the required return on the market as a whole.[65]

Q. What Risk-Free Rate does Ms. Bulkley use in her CAPM?

A. She uses the following three risk-free rates: (1) current 30-day average yield on 30-year Treasury bonds (4.77 percent), (2) projected 30-year Treasury yield for Q2 2026 through Q2 2027 (4.68 percent), and (3) projected yield 30-year Treasury bonds between 2027-2031 (4.60 percent).[66]

Q. What beta coefficient does Ms. Bulkley use in her CAPM?

A. She uses the following two historical beta coefficients, both from Value Line: (1) the current Value Line beta, based on five years of weekly returns relative to the New York Stock Exchange Composite Index; and (2) a long-term average of the

[64] Bulkley, Exh. AEB-1T at 52:4–9 (filed Mar. 20, 2026).
[65] *Id.* at 52:10–11 and 53:1–5.
[66] *Id.* at 53:16–18 and 54:1–3.

Value Line beta coefficients for her proxy group calculated over 2013 through 2025.[67]

Q. What risk premium does Ms. Bulkley use in her CAPM?

A. Ms. Bulkley estimates her market risk premium as the difference between an implied expected equity market return and the risk-free rate. As shown in Bulkley, Exhibit AEB-8, she calculates the expected market return by applying a constant growth DCF model to the companies in the S&P 500 Index, using a market capitalization-weighted dividend yield of 1.29 percent and a weighted long-term analyst growth rate of 12.04 percent, producing an estimated required market return of 13.40 percent as of December 31, 2025.[68] Measured against her three risk-free rates, this produces market risk premiums of 8.63 percent to 8.80 percent.[69]

Q. Does Ms. Bulkley use an appropriate risk-free rate in her CAPM?

A. In principle, no. As discussed below, when selecting a security to estimate the risk-free rate, it is important to choose one with a beta coefficient as close to zero as possible because, by definition, the risk-free rate in the CAPM model should have no correlation with market movements. This is where the 30-year Treasury bond yield falls short, as it has an established non-zero beta, meaning it does not behave as a truly risk-free asset. In contrast, the three-month Treasury bill yield has a considerably lower beta, making it a superior choice for estimating the risk-free rate.

[67] *Id.* at 54:4–11.
[68] *Id.* at 54:12–7 and 55:1–2.
[69] Bulkley, Exh. AEB-6 (filed Mar. 20, 2026).

Additionally, 30-year U.S. Treasury bonds are not truly risk-free. Holding a long-term Treasury bond exposes investors to interest rate risk throughout its life. The collapse of Silicon Valley Bank (SVB) in 2023 underscores this risk. As interest rates rose sharply, the market value of SVB's bond portfolio fell by over $17 billion, leaving the bank with substantial unrealized losses. This portfolio did not consist of short-term instruments like three-year bonds; rather, it was heavily concentrated in long-duration assets, with over 94 percent of SVB's held-to-maturity securities having maturities greater than 10 years.[70] When depositors attempted to withdraw $42 billion in a single day, SVB lacked the liquidity to meet these demands, in part because it could not hold its bonds to maturity without realizing those losses.[71] This contributed to SVB's downfall, demonstrating that long-term Treasury bonds carry significant risk and may not be the best proxy for the risk-free rate in CAPM calculations.

As outlined in Rothschild, Exhibit ALR-4 at 2, my spot and weighted average short-term risk-free rates are 3.87 percent and 3.76 percent, respectively. My spot and weighted average long-term risk-free rates are 4.91 percent and 4.95 percent, respectively. These four rates average 4.37 percent. The risk-free rate

[70] *SVB Financial Group*, Form 10-K, SEC EDGAR, at 66, .https://www.sec.gov/Archives/edgar/data/719739/000071973923000021/sivb-20221231.htm (last visited July 22, 2026). The table detailing the remaining contractual principal maturities for Held-to-Maturity (HTM) securities shows that of the $91.3 billion total net carry value of the HTM portfolio, $86.0 billion was categorized in the "After Ten Years" maturity bucket (approximately 94.2 percent).
[71] Telis Demos, *What Happened With Silicon Valley Bank?*, WSJ (Mar. 14, 2023), https://www.wsj.com/articles/silicon-valley-bank-svb-financial-what-is-happening-299e9b65?msockid=03d6b6f63a2464242c0ba1563b396569.

component of Ms. Bulkley's CAPM analysis range between 4.60 percent and 4.77 percent.[72]

Ms. Bulkley's use of interest rate forecasts to determine the risk-free rate is flawed in principle because current market yields on U.S. Treasury bonds already reflect investor expectations. As discussed above, PSE's authorized ROE should be based on market data, since investors provide the capital. While in this case, her use of forecasts does not artificially inflate her CAPM results, her approach introduces unnecessary subjectivity and could lead to inaccurate cost of equity estimates (either too high or too low) under different capital market conditions. Therefore, her CAPM methodology should not be used to set rates in future Washington proceedings.

Q. Do Ms. Bulkley's beta coefficients overstate the Cost of Equity?

A. Yes. Ms. Bulkley's CAPM results are not a reliable indicator of the cost of equity because she uses historical beta coefficients. Her current Value Line betas average 0.76 for the proxy group, and her long-term average beta—the mean of the annual Value Line betas from 2013 to 2025—is 0.77.[73] Over the past three months, my forward-looking option-implied betas have had a weighted average of 0.64.[74] and my six-month and two-year historical betas for the Bulkley Proxy Group have had a weighted average of 0.263 and 0.431, respectively, over the past three months.[75]

[72] Bulkley, Exh. AEB-1T at 53:16–18 and 54:1–3.
[73] Bulkley, Exh. AEB-6 (filed Mar. 20, 2026); Bulkley, Exh. AEB-7 (filed Mar. 20, 2026).
[74] Rothschild, Exh. ALR-4 at 3 (Capital Asset Pricing Model).
[75] *Id.* at 3.

Q. Do you believe Ms. Bulkley's market risk premium portion of her CAPM analysis is reasonable?

A. No, I believe Ms. Bulkley's market risk premium components between 8.63 percent and 8.80 percent are excessive and lead to an inflated CAPM result.[76] As explained in the CAPM section starting on page 31, I determined that investors are demanding a significantly lower equity risk premium of between 3.31 percent and 4.95 percent.[77]

This conclusion is supported by prominent valuation authorities who arrive at figures substantially lower than Ms. Bulkley's. For example, Professor Aswath Damodaran from NYU (who finds an equity risk premium (trailing 12-month, adjusted payout) of 4.38 percent as of March 1, 2026),[78] and further supports the argument that Ms. Bulkley equity risk premium estimation is excessively high.

Additionally, based on calculations by P. Brett Hammond[79] and Martin L. Leibowitz,[80] which were based on a literature survey and estimates from participants in the Equity Risk Premium Forum, they found the most frequent estimate of the 10-year equity risk premium to be four percent.

[76] Bulkley, Exh. AEB-6 (filed Mar. 20, 2026).
[77] Rothschild, Exh. ALR-4 at 1 (Capital Asset Pricing Model); *Id.* at 5.
[78] Aswath Damodaran, PhD., *Damodaram Online*, Stern School of Bus., NYU, https://pages.stern.nyu.edu/~adamodar/ (last visited July 22, 2026).
[79] P. Brett Hammond is a Research Professional at the Capital Group and a former Managing Director and Chief Investment Strategist at TIAA-CREF. He has authored numerous studies on asset allocation and retirement security and serves as a Research Fellow for the CFA Institute Research Foundation.
[80] Martin L. Leibowitz is the President of Advanced Portfolio Studies LLC and a former Vice Chairman and Chief Investment Officer of TIAA-CREF. A widely recognized authority on fixed-income analysis and portfolio strategy, he has authored several seminal books on finance, including Inside the Yield Book, and is a recipient of numerous awards from the CFA Institute.

The authors of *Revisiting the Equity Risk Premium* noted "Despite radically different market environments, it is striking that the estimates in all three forums were so similar. They tended to be in the three percent–five percent range, and notably, in comparison to historical returns, none of them included estimates above seven percent or below zero." The three forums were in 2001, 2011, and 2021.[81] Ms. Bulkley's 8.63 percent to 8.80 percent market risk premium exceeds the entire three percent to five percent range produced by three decades of expert consensus.

In summary, Ms. Bulkley's CAPM results are unreasonably high, because her equity risk premium component is above current market-based indicators, in comparison to my own analysis which is based on stock option prices and the conclusions of prominent research.

Q. Do Ms. Bulkley's CAPM results overstate the COE because the market risk premium portion of her analysis is higher than investors' expectations?

A. Yes. Ms. Bulkley's CAPM uses a market risk premium of 8.63 percent to 8.80 percent based on an expected market return on the S&P 500 of 13.40.[82] The equity risk premium portion of my CAPM, which is based directly on a measure of investors' expectations, is significantly lower than Ms. Bulkley's. The market risk premia I use in my Weighted Average CAPM analysis with short- and long-term risk-free rates are 4.95 percent and 3.76 percent, respectively.[83] The market risk

[81] P. Brett Hammond, Martin L. Leibowitz, Laurence B. Siegel, and Paul Mccaffrey, *Revisiting the Equity Risk Premium, Introduction: Three Decades of Equity Risk Premium Forums,* at VI, CFA Inst. Research Foundation (2023), https://www.cfainstitute.org/-/media/documents/article/rf-brief/Revisiting-the-Equity-Risk-Premium.pdf.
[82] Bulkley, Exh. AEB-8 (filed Mar. 20, 2026).
[83] Rothschild, Exh. ALR-4 at 1 (Capital Asset Pricing Model).

premia I use in my Spot CAPM analysis with short- and long-term risk-free rates are 4.35 percent and 3.31 percent, respectively.[84]

C. Empirical CAPM Method

Q. Please summarize Ms. Bulkley's use of the Empirical Capital Asset Pricing Model (ECAPM) and her justification for its inclusion.

A. Ms. Bulkley utilizes the ECAPM as a variant of the CAPM designed to address what she describes as "the tendency of the 'traditional' CAPM to underestimate the cost of equity for companies with low beta coefficients such as regulated utilities."[85] She implements the formula $k_e = r_f + 0.75\beta(r_m - r_f) + 0.25(r_m - r_f)$, which applies a 25.00 percent weight to the market risk premium without any effect from the beta coefficient, and scales only the remaining 75.00 percent by beta.[86] The only authority she cites is Dr. Roger Morin's *New Regulatory Finance*, and she asserts that "the ECAPM is not redundant to the use of adjusted betas in the traditional CAPM."[87]

Q. Please respond to Ms. Bulkley's use of the ECAPM.

A. The Commission should view Ms. Bulkley's use of the ECAPM with significant skepticism. While it is presented as a necessary technical correction, the model is far from universally accepted; in fact, many highly respected financial scholars are deeply critical of such empirical "fudge factors." Under the standard CAPM, a company with a beta coefficient below 1.00 (one less risky than the overall market)

[84] *Id.* at 5.
[85] Bulkley, Exh. AEB-1T at 56:15–17 (filed Mar. 20, 2026).
[86] *Id.* at 56:3–9.
[87] *Id.* at 56:17–18.

receives a proportionally smaller risk premium. The ECAPM overrides part of that proportionality: it awards 25 percent of the full market risk premium to every company regardless of its risk, and scales only the remaining 75 percent by each proxy company's beta. In effect, one quarter of the premium is granted as though each proxy company were as risky as the market as a whole. Because regulated utilities essentially always have betas below 1.00—every beta in Ms. Bulkley's analysis is between 0.65 and 0.95[88] — this adjustment can only raise the indicated COE relative to the standard CAPM. The effect is visible in her own results: every ECAPM figure exceeds its CAPM counterpart, with mean results of 11.81 to 11.94 percent and individual company results as high as 13.06 percent.[89]

- **Double-Counting an Existing Adjustment:** Ms. Bulkley's ECAPM compounds an adjustment that is already embedded in her inputs. The Value Line betas she uses are published on an adjusted basis—pushed upward toward 1.0 before publication.[90] Her own equation concedes as much: she defines the beta input to her ECAPM as the "Adjusted beta coefficient of an individual security," and describes the model as applying its weighting to "the product of the adjusted beta coefficient and the market risk premium."[91]

[88] Bulkley, Exh. AEB-6 (filed Mar. 20, 2026); Bulkley, Exh. AEB-7 (filed Mar. 20, 2026).
[89] Bulkley, Exh. AEB-6 (filed Mar. 20, 2026).
[90] Andrew J. Cueter, *Using Beta,* Value Line (Oct. 02, 2012), https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BFDB60A53-1930-4DC0-B15C-B6037AE901D8%7D. *Value* Line's "How to Use Beta" educational guide and their direct reference to Marshall Blume's 1971 *Journal of Finance* paper.
[91] Bulkley, Exh. AEB-1T at 56:3–4 (filed Mar. 20, 2026).

Applying the ECAPM's 75/25 weighting on top of betas that have already been adjusted toward the market average double-counts the same purported low-beta effect, and her assertion that the two are "not redundant" rests solely on Dr. Morin.

- **Critique of "Data Mining":** Leading authorities like Professor Aswath Damodaran and the standard textbook *Principles of Corporate Finance* (Brealey, Myers, and Allen) have warned that these types of empirical adjustments are often the product of data mining. While certain "anomalies" (like the low-beta bias) may appear in historical data, they often fade or disappear entirely once they are widely recognized by the market.[92]
- **Highly Biased Academic Source:** It is instructive that the only authority Ms. Bulkley cites in support of the ECAPM is Dr. Roger Morin, who served as an expert witness for utility companies for decades. It is unsurprising that the model he champions consistently produces higher authorized returns for utilities.
- **Part of a Pattern of Selective Inflation:** The ECAPM should not be viewed in isolation. Ms. Bulkley abandoned the Bloomberg 10-year betas she relied on in prior cases on the ground that the five-year Value Line data "no longer includes the effect of COVID-19

[92] Richard A. Brealey, Stewart C. Myers, Franklin Allen, and Alex Edmans, *Principles of Corporate Finance*, at 228, (McGraw-Hill Irwin, New York, 12th Ed. 2017).

on the beta estimate."[93] Yet she retains a long-term average beta—the higher of her two inputs—calculated over 2013 through 2025, a window that squarely includes the COVID-19 period she says should be excluded, and whose five COVID-affected observations (annual mean betas of 0.56–0.58 in 2018–2019, rising to 0.89, 0.89, 0.88, 0.92, and 0.94 in 2020 through 2024 before returning to 0.75 in 2025) are the five highest values in her own exhibit.[94] Like the ECAPM, each of these methodological choices operates in only one direction: upward.

- **Violation of an Economic Boundary:** Regardless of the mathematical complexity added, Ms. Bulkley's ECAPM results violate a basic economic boundary. Her ECAPM indicates that low-risk regulated utilities require a return of 11.81 percent to 11.94 percent—roughly 300 basis points *higher* than the 8.90 percent to 9.34 percent cost of equity that current market data indicate for the competitive S&P 500 as a whole. There is no credible evidence that investors demand a materially higher return from a rate-regulated monopoly than from the overall equity market.

In summary, the ECAPM is an analytically unsound methodology rooted in historical data mining rather than current market reality, and its results should be disregarded.

[93] Bulkley, Exh. AEB-1T, n.68 (filed Mar. 20, 2026).
[94] Bulkley, Exh. AEB-7 at 54:7–11 (filed Mar. 20, 2026).

D. Risk Premium Analysis

Q. Please describe Ms. Bulkley's Risk Premium Analysis.

A. In her Risk Premium analysis, Ms. Bulkley estimates the cost of equity for PSE by assessing the historical spread between authorized utility ROEs and long-term government bond yields. Her approach follows these key steps:

1. Concept of the Model:

- The method assumes that investors require a premium above risk-free bond yields to invest in utility equities.
- This risk premium reflects the additional return investors expect for taking on equity risk relative to bonds.

2. Methodology:

- She compares authorized ROEs for electric and gas utilities to historical yields on long-term U.S. Treasury bonds.[95]
- By analyzing past relationships, she derives an average historical risk premium (i.e., the spread between ROEs and bond yields).
- This spread is then applied to current bond yields to estimate PSE's cost of equity.

3. Findings and Conclusion:

- Using this approach, Ms. Bulkley's Risk Premium analysis produces cost of equity 10.64 percent to 10.74 percent for electric utilities and 10.49 percent to 10.59 percent for natural gas utilities, based on

[95] Bulkley, Exh. AEB-1T at 58:3–14 (filed Mar. 20, 2026).

regressions of authorized ROEs against 30-year Treasury yields from January 1980 through December 2025.[96]

- She asserts that this aligns with her broader analysis and justifies a final recommended ROE of 10.8 percent.

Q. Should Ms. Bulkley's Bond Yield Plus Risk Premium analysis be considered?

A. No. The overriding problem with Ms. Bulkley's bond yield plus Risk Premium analysis is that it does not address the cost of equity at all. She simply calculates the historical relationship between authorized ROEs and interest rates. Authorized ROEs are applied to *book equity* and therefore, in order to determine investors' return expectations, it is required to consider the *market price* investors are willing to pay for the companies with these authorized ROEs. The market-to-book ratios of electric and gas utility stocks is about two.[97] Therefore, as explained in Rothschild, Exhibit ALR-7, with such a high market-to-book ratio, the return to equity investors will likely be significantly lower than the return on book equity Ms. Bulkley uses in her Risk Premium Analysis.

E. Business and Financial Risks and Other Considerations

Q. How does Ms. Bulkley justify her claim that PSE faces higher business risks than her proxy group?

A. Ms. Bulkley identifies four primary categories of company-specific risk that she claims support her recommendation: (1) the effect of the proposed MYRP; (2) the ability to recover fuel and power purchase costs (the Power Cost Adjustment

[96] *Id.* at 60:3–4
[97] Rothschild, Exh. ALR-4 at 1 and 2a (Discounted Cash Flow).

Mechanism (PCAM); (3) capital investments related to PSE's Clean Energy Action Plan and Clean Energy Implementation Plan (CEIP), and (4) wildfire risk.[98]

Q. What is the total magnitude of the adjustments Ms. Bulkley makes to account for these specific risks?

A. Ms. Bulkley makes no specific numerical adjustments for any of these factors. However, she states that "[w]hile I do not make specific adjustments to my ROE recommendation for these factors, I do consider them in the aggregate when determining where my recommended ROE falls within the range of the analytical results"[99] and her requested 10.80 percent sits below the 11.00 percent midpoint of her 10.50 percent to 11.50 percent range.

Q. What does Ms. Bulkley claim regarding PSE's Power Cost Adjustment Mechanism (PCAM)?

A. Ms. Bulkley claims that the PCAM—or the Power Cost Adjustment (PCA) as she refers to it as in her testimony—does not fully mitigate power cost risk for PSE. Under the current PCAM, variations from baseline power costs are shared between customers and shareholders: PSE bears over- or under-collections up to $17 million (the dead band); between $17 million and $40 million, PSE is apportioned 35 percent of over-collections and 50 percent of under-collections; and above $40 million, PSE is apportioned 10 percent.[100] PSE petitioned to eliminate the dead band and sharing bands in Docket UE-250537; the Commission dismissed that

[98] Bulkley, Exh. AEB-1T at 27:1–9 (filed Mar. 20, 2026).
[99] *Id.* at 3:5–8.
[100] Bulkley, Exh. AEB-1T at 29:13–20 and 30:1–11 (filed Mar. 20, 2026).

petition on February 23, 2026, based on RCW 80.28.425(5), and PSE renews the request in this General Rate Case through the Direct Testimony of Jon A. Piliaris, Exhibit JAP-1T.[101]

Ms. Bulkley states that "[a]s shown in Exh. AEB-11, approximately 90 percent of the utility operating subsidiaries of the proxy group companies either operate in a state that has restructured (i.e., the electric utilities do not own generation) or are allowed to pass through fuel costs and purchased power costs directly to customers without dead bands and sharing bands. Therefore, PSE's proposal to remove the dead band and sharing band is be consistent [sic] with the majority of the proxy group companies. In the event that PSE's proposal is not authorized, PSE's risk associated with the recovery of power costs will be significantly greater than the proxy group, on average."[102]

Q. Does Ms. Bulkley's testimony suggest that the PCAM exposes PSE to power cost risk that warrants a higher Cost of Equity?

A. Ms. Bulkley identifies the PCAM as a factor to consider; however, her own testimony describes a mechanism that shares power cost variances between customers and shareholders within defined limits—a $17 million dead band, specified percentage shares of both over-collections and under-collections between $17 million and $40 million, and a 10 percent share above $40 million.[103] Whatever risk remains with PSE under those terms is bounded by the mechanism's own

[101] *Id.* at 30:12–19.
[102] Bulkley, Exh. AEB-1T at 31:4–12.
[103] Bulkley, Exh. AEB-1T at 29:14–20 and 30:1–11 (filed Mar. 20, 2026).

structure, and that structure is two-sided: as she describes it, PSE retains a share of over-recoveries as well as under-recoveries. I take no position on how large or small the retained risk is in economic terms, or on whether the PCAM, or the Company's pending proposal to remove the dead band and sharing bands, is in the public interest.[104]

Q. Does Ms. Bulkley quantify the power cost risk she says the PCAM leaves with PSE?

A. No. Her support consists of a single comparison: that approximately 90 percent of the utility operating subsidiaries of the proxy group companies either operate in restructured states or "are allowed to pass through fuel costs and purchased power costs directly to customers without dead bands and sharing bands."[105] Counting which proxy companies have a similar mechanism is not a measurement of the exposure PSE retains under this one. She does not estimate the retained exposure, measure its effect on PSE's cash flows or risk profile, or translate it into any effect on the cost of equity, and consistent with her treatment of every risk factor, she makes no numerical adjustment for it.[106]

Q. Does the PCAM provide a basis for an ROE above the Cost of Equity indicated by the proxy group?

A. No, on either branch of Ms. Bulkley's own testimony. If the Commission grants PSE's request to remove the dead band and sharing bands, then by her own account

[104] *Id.* at 30:14–19.
[105] *Id.* at 31:4–12.
[106] Bulkley, Exh. AEB-1T at 3: 5–8 (filed Mar. 20, 2026).

PSE's proposal "is be consistent [sic] with the majority of the proxy group companies," and the factor disappears.[107] If the Commission does not, what remains is the bounded, unquantified exposure described above; the burden of demonstrating a risk differential warranting a departure from the comparable-company result rests with the Company. I also note that Ms. Bulkley's own testimony reports that PSE currently holds investment-grade ratings of BBB (Outlook: Stable) from S&P and Baa1 from Moody's under the existing framework, of which the PCAM is a part.[108] An unquantified, capped residual does not carry the Company's burden.

Q. Is Ms. Bulkley's risk comparability analysis complete?

A. No, it is fundamentally incomplete. Ms. Bulkley points to factors like the Power Cost Adjustment (PCA) to qualitatively argue that PSE faces greater risk than her proxy group, yet she fails to provide any specific quantification of how this mechanism actually impacts the cost of equity. While she relies on this unquantified PCA risk to justify a premium return, she simultaneously ignores offsetting risks that exist within her own proxy group—most notably, unregulated business operations.

Her screening criteria require only that a company "derive more than 60 percent of total operating income from regulated operations." [109] By construction, her proxy group can include companies that derive a minority of their income from

[107] *Id.* at 31: 8–10.
[108] *Id.* at 20:7–9.
[109] *Id.* at 21:23–24.

unregulated, competitive businesses. Even when this unregulated portion is relatively small, it is inherently riskier than regulated electric and gas service because it is subject to competition: a competitive business that loses money cannot file a rate case to recover the shortfall, while a regulated utility can. Because investors demand a higher return to compensate for greater uncertainty, the presence of unregulated operations tends to push the proxy group's measured cost of equity above that of a comparable purely regulated utility. Ms. Bulkley neither examines this factor nor quantifies its effect.

That omission is notable given her own treatment of capital structure, where Ms. Bulkley eliminates the impacts of unregulated operations by benchmarking PSE against "the utility operating subsidiaries of the proxy group companies," which she describes as "most risk-comparable to PSE."[110] She cannot have it both ways. If holding-company-level data are too contaminated by unregulated operations to benchmark capital structure, they also affect the risk—and therefore the measured cost of equity—of the very same proxy companies whose holding-company stock prices drive her model results. By failing to quantify the purported risks of the PCA, while concurrently failing to account for these higher-risk, non-utility operations within her proxy group, she has not met the burden of establishing true risk comparability.

[110] *Id.* at 63:2–10.

Q. Does Ms. Bulkley's testimony suggest that Puget Sound Energy is exposed to significant wildfire risk that necessitates a premium return on equity?

A. Ms. Bulkley does highlight wildfire risk as a factor to consider; however, her own testimony concedes that the regulatory framework in Washington is robust and credit-supportive. She explicitly acknowledges that PSE's wildfire mitigation plan reduces the probability of material wildfire exposure and that the existing ability to recover costs—including operations and maintenance, capital investments, and insurance premiums—through the Wildfire Prevention Tracker is "credit supportive."

Q. Does she conclude that these mechanisms eliminate the risk?

A. Ms. Bulkley does not argue that these mechanisms eliminate all potential liability, but she confirms that they provide a supportive regulatory framework that allows PSE to manage its exposure and access capital on reasonable terms.

Q. Given her assessment, is a specific upward adjustment to PSE's Return on Equity required to account for wildfire risk?

A. No. While Ms. Bulkley uses these factors in the "aggregate" to justify placing her recommendation at the higher end of her analytical range, she provides no specific quantification of a "wildfire risk premium." Because PSE is already authorized to recover wildfire-related costs through ratepayer-funded mechanisms, including insurance premiums, any further inflation of the Return on Equity to compensate for this "residual" risk would effectively result in the double-counting of risk mitigation costs. Consequently, I agree with her conclusion that the regulatory

environment is supportive, which confirms that PSE's risks are effectively managed under the current framework.

Q. Do you agree with Mr. Piliaris that the effect of a regulatory mechanism on the cost of equity depends on the risk profile of the proxy group?

A. Yes, as a matter of principle. As Mr. Piliaris describes, "[s]ince the cost of equity is estimated using a benchmarking exercise, it is reasonable to expect that as the risk of these proxy companies change over time, the Commission's determinations regarding the effect of any mechanism on the cost of equity would also change based on the risk profile of the proxy group."[111] I agree — a benchmarking exercise is only as good as the benchmark. But the Company's witnesses do not follow this principle. They present their analysis as sufficiently comprehensive while not accounting for known risk factors that bear directly on the comparability of the proxy group—most notably the unregulated operations that Ms. Bulkley's 60-percent screening criterion admits into the group but her analysis never examines. Applying Mr. Piliaris' own standard, the Commission cannot determine the effect of the PCAM, or any mechanism, on the cost of equity without an accounting of the proxy group's full risk profile.

X. CONCLUSION

Q. Please summarize your recommendations in this case.

A. The Commission should reject Ms. Bulkley's recommended ROE of 10.8 percent because it significantly exceeds PSE's actual COE as indicated by current market

[111] Jon A. Piliaris, Exh. JAP-8 at 15:17–20 (filed Mar. 20, 2026).

data. Instead, we recommend that the Commission set PSE's rates based on the following:

- An overall cost of capital of 6.56% (6.50% - 6.72%);
- An ROE of 8.17% (8.03% - 8.55%);
- A capital structure containing 44.00% common equity and 54.72% long-term debt; and
- A long-term debt cost rate of 5.33%.

These recommendations satisfy the *Hope* and *Bluefield* standards, they are grounded in current market data, provide PSE a reasonable opportunity to attract capital on fair terms, and protect customers from paying too much above the market-based COE.

Q. Does this conclude your direct testimony?

Yes.