Exhibit No. SSC-0006

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

SOUTHERN STAR CENTRAL GAS PIPELINE, INC.	**)**	**DOCKET NO. RP21-___-000**

PREPARED DIRECT TESTIMONY
OF
BENTE VILLADSEN

April 30, 2021

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SUMMARY OF PREPARED DIRECT TESTIMONY
OF
BENTE VILLADSEN

Dr. Bente Villadsen provides direct testimony before the Federal Energy Regulatory Commission ("FERC" or "the Commission") on behalf of Southern Star Central Gas Pipeline, Inc., ("Southern Star") on the matter of return on equity ("ROE"). Dr. Villadsen recommends a ROE of 14.6 percent, which results from the application of Commission's discounted cash flow ("DCF") and the capital asset pricing model ("CAPM") estimation methods, as specified in the Commission's "*Policy Statement on Determining Return on Equity for Natural Gas and Oil Pipelines*" ("*Pipeline Policy Statement*").[1] The recommended ROE of 14.6 percent represents the median of the upper-third risk-range of the overall composite zone of reasonableness, which Dr. Villadsen computed according to Opinion No. 569-A. The range of estimates in the upper-third of the overall composite zone of reasonableness reflects the applicable range for above-average risk companies, such as Southern Star.

In her testimony, Dr. Villadsen first defines the cost of capital, its relation to risk, and Commission precedent as it pertains to natural gas pipelines.

Second, Dr. Villadsen discusses her selection of a Core and Expanded Sample of pipeline companies that are used as proxies for Southern Star to assess its cost of equity. The Core Sample consists of publicly traded companies that own FERC-regulated pipelines and have substantial natural gas pipeline activity in the form of assets or income. The Expanded Sample broadens the group of pipeline companies by looking to a lower, yet still meaningful, proportion of natural gas

[1] 171 FERC ¶ 61,155, Docket No. PL19-4-000, "Policy Statement on Determining Return on Equity for Natural Gas and Oil Pipelines," issued May 21, 2020.

pipeline activity in order to achieve at least five companies in the sample. This Expanded Sample also serves as a check on the reasonableness of Dr. Villadsen's Core Sample.

Third, Dr. Villadsen outlines the estimation procedures she used in this proceeding to calculate the required return on equity for Southern Star. She discusses the Commission's traditional DCF methodology and the CAPM methodology, and explains the data sources she used to implement these two models.

Fourth, Dr. Villadsen finds that the Core Sample results in a median ROE of the upper-third of the overall composite zone of reasonableness of 14.6 percent. This estimate is supported by the results for the Expanded Sample. Figure 1 below summarizes the results of Dr. Villadsen's analysis:

Figure 1: Summary of Results

		Core Sample				Expanded Sample			
		IBES DCF/IBES CAPM		***IBES DCF/VL CAPM***		**IBES DCF/IBES CAPM**		***IBES DCF/ VL CAPM***	
		Min	Max	Min	Max	Min	Max	Min	Max
DCF	[a]	8.8%	14.8%	8.8%	14.8%	8.8%	14.8%	8.8%	14.8%
CAPM	[b]	11.1%	17.7%	10.5%	16.8%	11.1%	17.7%	10.5%	16.8%
Composite Range	**[c]**	**9.9%**	**16.2%**	**9.7%**	**15.8%**	**9.9%**	**16.2%**	**9.7%**	**15.8%**
Zone of Reasonableness									
Upper Risk Range	[d]	14.1% - 16.2%		13.7% - 15.8%		14.1% - 16.2%		13.7% - 15.8%	
Central Tendency	[e]	15.0%		**14.6%**		15.0%		**14.6%**	
Median		*15.0%*		*14.6%*		*15.0%*		*14.6%*	
Upper Risk Midpoint		*15.2%*		*14.7%*		*15.2%*		*14.7%*	
Middle Risk Range	[f]	12.0% - 14.1%		11.7% - 13.7%		12.0% - 14.1%		11.7% - 13.7%	
Central Tendency	[g]	12.4%		12.1%		12.8%		12.5%	
Median		*12.4%*		*12.1%*		*12.8%*		*12.5%*	
Upper Risk Midpoint		*13.1%*		*12.7%*		*13.1%*		*12.7%*	
Lower Risk Range	[h]	9.9% - 12.0%		9.7% - 11.7%		9.9% - 12.0%		9.7% - 11.7%	
Central Tendency	[i]	10.8%		10.4%		10.8%		10.4%	
Median		*10.8%*		*10.4%*		*10.8%*		*10.4%*	
Upper Risk Midpoint		*11.0%*		*10.7%*		*11.0%*		*10.7%*	

Based on the results in the Figure 1 above and Mr. Thapa's finding that Southern Star has higher business risk than the median of the Core Sample, Dr. Villadsen recommends a ROE of 14.6 percent.

GLOSSARY

Bps	Basis Points
CAPM	Capital Asset Pricing Model
DCF	Discounted Cash Flow
ENB	Enbridge Inc.
ENBL	Enable Midstream Partners
EPD	Enterprise Products
EPS	Earnings Per Share
ET	Energy Transfer LP
KMI	Kinder Morgan Inc.
MLP	Master Limited Partnership
NEB	Canadian National Energy Board
NYSE	New York Stock Exchange
ROE	Return on Equity
TRP	TransCanada Corporation
TRSL	Thomson Reuters Spreadsheet Link
TSE	Toronto Stock Exchange
WMB	Williams Companies, Inc.

PREPARED DIRECT TESTIMONY
OF
BENTE VILLADSEN

I. INTRODUCTION AND SUMMARY

Q1: Please state your name, title, and business address.

A1: My name is Bente Villadsen. I am a Principal at The Brattle Group's ("Brattle") Boston office located at One Beacon St., Suite 2600, Boston, MA 02108, USA.

Q2: On whose behalf are you submitting testimony?

A2: I am submitting testimony on behalf of Southern Star Central Gas Pipeline, Inc. ("Southern Star" or the "Company").

Q3: Please briefly summarize your professional qualifications and educational background.

A3: I am a Principal of *The Brattle Group*, an economic, environmental, and management consulting firm with offices in Boston, Washington D.C., Chicago, London, San Francisco, Madrid, Rome, New York, Toronto, Sydney, and Brussels with specialties including financial economics, regulatory economics, and the gas, water, electric, and pipeline industries. My work concentrates on regulatory finance and accounting. As a Principal, I work in the areas of cost of capital, risk, regulatory accounting, regulatory precedent and related matters for regulated entities, regulators, or investors.

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

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

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

Additional details regarding my professional experience and qualifications are contained in my résumé, which is attached as Exhibit No. SSC-0007.

Q4: Have you previously testified before or submitted testimony to this Commission?

A4: Yes. I have submitted testimony on cost of capital in Docket Nos. ER19-1553, RP19-59 and RP19-1353, and RP19-1291, and testimony on regulatory accounting matters before the Commission in Docket Nos. PA10-13-000 and EL11-13-000.

Q5: What is the purpose of your testimony in this proceeding?

A5: The purpose of my testimony is to determine the appropriate allowed return on equity ("ROE") for Southern Star. I do so by determining the zone of reasonableness for a proxy group of pipeline companies by (1) using the Discounted Cash Flow ("DCF") methodology that the FERC traditionally has applied to natural gas pipeline companies and (2) using the Capital Asset Pricing Model ("CAPM") methodology approved in the Commission's "*Policy Statement on Determining Return on Equity for Natural Gas and Oil Pipelines*" ("*Pipeline*

Policy Statement").[2] Having determined the zone of reasonableness indicated by these financial analyses, I discuss how the results are best applied in determining a reasonable ROE for Southern Star.

Q6: How did you approach the task of determining Southern Star's cost of equity?

A6: First, I selected a proxy group of comparable companies that reflect the business risk characteristics of a natural gas pipeline at this time. In order to achieve a large enough sample for statistical robustness, given current data limitations, I also expanded the sample to include an additional company by relaxing certain sample selection criteria. Doing so allows me to rely on a sample of five companies, consistent with the Commission's preference.[3] For each company I include in my "Core" and "Expanded" sample, I apply the Commission's DCF, as articulated in the *Pipeline Policy Statement.* In addition to the DCF methodology, I also calculate ROE under the CAPM methodology based on both Value Line and *IBES* growth rates based market risk premium. Again, the use of the CAPM is based on the Commission's *Pipeline Policy Statement*.

The results of my analysis are summarized in Figure 2 below. Figure 2 shows the overall composite range of reasonableness—which is computed using the DCF and CAPM zones of reasonableness—and the median and midpoint estimates for each of the three risk-ranges computed consistent with the methodology specified in the *Pipeline Policy Statement*.

Q7: Please summarize the results of your ROE analysis.

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[2] 171 FERC ¶ 61,155, Docket No. PL19-4-000, "Policy Statement on Determining Return on Equity for Natural Gas and Oil Pipelines," issued May 21, 2020.

[3] *Pipeline Policy Statement* at P 59 ("The Commission has explained that proxy groups 'should consist of at least four, and preferably at least five members'….").

A7: Implementation of the DCF model and the CAPM according to the methodology specified in the *Pipeline Policy Statement* provides a composite zone of reasonableness of 9.7 percent to 15.8 percent. As explained in the Prepared Direct Testimony of Mr. Anul Thapa ("Thapa Testimony"), Southern Star's business risk is above-average, when measured relative to the proxy group of companies ("sample" or "proxy group"). Consequently, a just and reasonable ROE for Southern Star is placed in the upper-third of the overall composite zone of reasonableness, at 14.6 percent. The ROE of 14.6 percent represents the median estimate of the upper-third of the overall composite zone of reasonableness results produced by the Commission-specified methodology. As discussed in the Thapa Testimony, the key reasons for Southern Star's above average risk are elevated competition or bypass risk from Southern Star's largest customer, a lower contract cover, and a higher degree of de-contracting and remarketing risk relative to the comparable companies.[4]

[4] Thapa Testimony, Exhibit No. SSC-0009.

Figure 2: Summary of Results

		Core Sample				Expanded Sample			
		IBES DCF/IBES CAPM		***IBES DCF/VL CAPM***		**IBES DCF/IBES CAPM**		***IBES DCF/ VL CAPM***	
		Min	Max	Min	Max	Min	Max	Min	Max
DCF	[a]	8.8%	14.8%	8.8%	14.8%	8.8%	14.8%	8.8%	14.8%
CAPM	[b]	11.1%	17.7%	10.5%	16.8%	11.1%	17.7%	10.5%	16.8%
Composite Range	**[c]**	**9.9%**	**16.2%**	**9.7%**	**15.8%**	**9.9%**	**16.2%**	**9.7%**	**15.8%**
Zone of Reasonableness									
Upper Risk Range	[d]	14.1% - 16.2%		13.7% - 15.8%		14.1% - 16.2%		13.7% - 15.8%	
Central Tendency	[e]	15.0%		**14.6%**		15.0%		**14.6%**	
Median		*15.0%*		*14.6%*		*15.0%*		*14.6%*	
Upper Risk Midpoint		*15.2%*		*14.7%*		*15.2%*		*14.7%*	
Middle Risk Range	[f]	12.0% - 14.1%		11.7% - 13.7%		12.0% - 14.1%		11.7% - 13.7%	
Central Tendency	[g]	12.4%		12.1%		12.8%		12.5%	
Median		*12.4%*		*12.1%*		*12.8%*		*12.5%*	
Upper Risk Midpoint		*13.1%*		*12.7%*		*13.1%*		*12.7%*	
Lower Risk Range	[h]	9.9% - 12.0%		9.7% - 11.7%		9.9% - 12.0%		9.7% - 11.7%	
Central Tendency	[i]	10.8%		10.4%		10.8%		10.4%	
Median		*10.8%*		*10.4%*		*10.8%*		*10.4%*	
Upper Risk Midpoint		*11.0%*		*10.7%*		*11.0%*		*10.7%*	

As shown in Figure 2 and again in Figure 2, the Commission's two-step DCF method produces a reasonable range of 8.8 percent to 14.8 percent using *IBES* growth rates only. The Commission's CAPM methodology, using Value Line growth rates, produces a reasonable range of 10.5 percent to 16.8 percent. I also computed the CAPM ROE estimates based on the CAPM methodology using *IBES* growth rates to determine the Market Risk Premium ("MRP"), which resulted in a reasonable range of 11.1 percent to 17.7 percent.

Given that Southern Star is of above-average business risk, I recommend placing its ROE in the upper-third of the estimated range for an ROE of 14.6 percent. The recommendation uses the median of that range as my point estimate. My recommendation is consistent across the Core and Expanded Samples for an above-average risk company, and is supported by the 15.0 percent median estimate based on CAPM results using *IBES* growth rates to calculate the MRP.

Q8: How is the remainder of your testimony organized?

A8: Section II formally defines the cost of capital and explains the principles relating to the estimation of the cost of capital for a business as well as the theory underlying the DCF and CAPM models. Section III first describes the process used to develop the Core and Expanded Samples of proxy comparable companies that I use to calculate the cost of equity using market data. Second, it describes the Commission's DCF and CAPM estimation methodologies as specified in the *Pipeline Policy Statement*. Section IV presents the results of my implementation of these two models for both the Core and Expanded Samples, and summarizes my interpretation of these results as it relates to the overall composite zone of reasonableness that I determine for Southern Star.

Q9: What exhibits are you sponsoring?

A9: I am sponsoring this Prepared Direct Testimony, Exhibit No. SSC-0006, as well as Exhibit No. SSC-0007, which contains my résumé, and Exhibit No. SSC-0008, which contains the tables supporting the results summarized in this testimony.

Q10: Were your testimony and exhibits prepared by you or under your direct supervision?

A10: Yes.

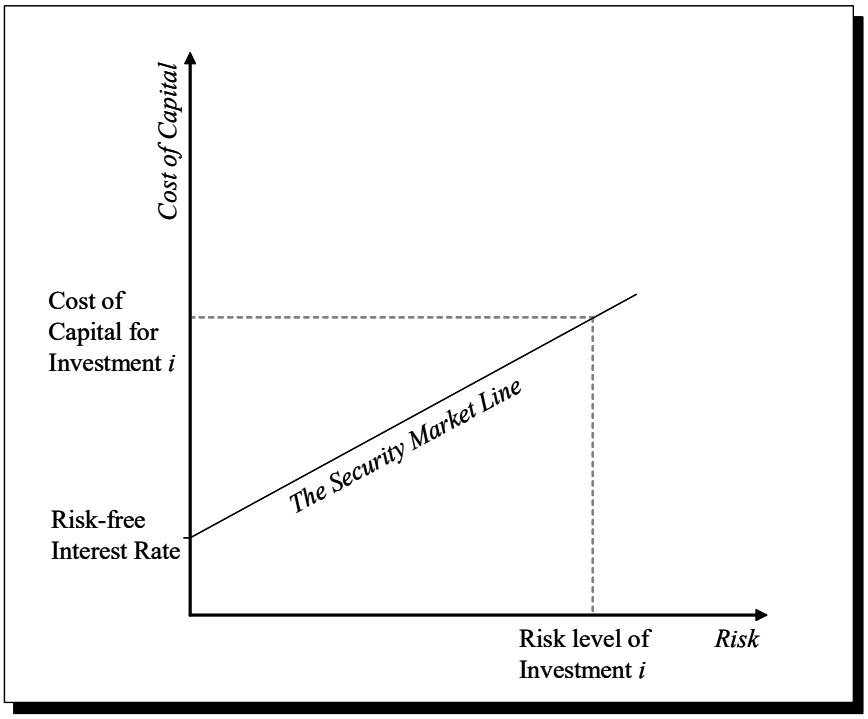
II. THE COST OF CAPITAL AND RISK

Q11: Please formally define the term "Cost of Capital."

A11: The cost of capital can be defined as *the expected rate of return in capital markets on alternative investments of equivalent risk*. In other words, it is the rate of return investors require based on the risk-return alternatives available in competitive capital markets. The cost of capital is a type of opportunity cost: it represents the rate of return that investors could expect to earn elsewhere without bearing more risk. The definition of the cost of capital recognizes a tradeoff between risk and return that is known as the "security market risk-return

line," or "security market line" for short. This line is depicted in Figure 3. The higher the risk, the higher the cost of capital. Variations of Figure 3 apply for all investments.

Figure 3: The Security Market Line



Q12: Please explain why the cost of capital is relevant in rate regulation?

A12: It has become routine in U.S. rate regulation to accept the "cost of capital" as the appropriate expected rate of return on utility investment. That practice is normally viewed as consistent with the U.S. Supreme Court's opinions in *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923), and *FPC v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

A return that determines the ROE (absent incentive or other adders) is the expected rate of return investors will require to maintain the Company's ability to attract capital and preserve its financial integrity.

Importantly, an inadequate return raises serious issues not only for the regulated utility but also for its customers. Specifically, it may adversely affect the utility's ability to provide stable and favorable rates (because the company may need to potentially postpone desirable projects that are not immediately required for reliable service in the near term) or it may require the company to file more frequent rate cases. Long-term, inadequate returns lead to inadequate investment, whether for maintenance or for new plant and equipment. The costs of an undercapitalized industry can be far greater than any short-run gains from shortfalls in the allowed rate of return. Moreover, in capital-intensive industries (such as the pipeline industry), systems with long expected service lives cannot be fixed overnight, so it becomes crucial to allow a return that ensures sufficient investments in the system.

III. THE COMMISSION'S COST OF CAPITAL METHODOLOGY SPECIFIED IN THE *PIPELINE POLICY STATEMENT*

Q13: How is this section of your testimony organized?

A13: This section first presents the sample companies used in the determination of the estimated ROE for Southern Star. It then describes the Commission's ROE methodology as laid out in the *Pipeline Policy Statement* and recent decisions and provides the specifics of the implementation of the DCF model and CAPM. Finally, this section discusses the results of the ROE calculations based on the methodology specified in the *Pipeline Policy Statement*.

A. Sample Selection

1. Criteria for Selecting the Proxy Group

Q14: Please describe the Commission's precedent for selecting a sample that best reflects the business risk of natural gas transmission.

A14: The Commission's *Proxy Group Policy Statement* regarding sample composition provides the most important guidance in this regard.[5] Specifically, the *Proxy Group Policy Statement* addresses criteria for assuring a sample that is both representative and robust. A key decision in the *Proxy Group Policy Statement* was that it explicitly permitted the inclusion of Master Limited Partnerships ("MLPs") in proxy groups for estimating the ROE of Commission-regulated pipeline companies.[6]

Q15: What was the genesis of the *Proxy Group Policy Statement*?

A15: Because of shrinking availability of suitable proxy group candidates, the Commission had to revise its criteria for sample selection. In *El Paso Natural Gas Co.*, 145 FERC ¶ 61,040 at P 595 (2013) ("*El Paso*"), FERC stated that it preferred to have at least five proxy group companies in order to ensure statistical accuracy.[7] The Commission's preference prior to *Williston Basin Interstate Pipeline Co.*, 104 FERC ¶ 61,036 (2003) ("*Williston Basin*"), was to select companies that satisfied the following criteria:

- The selected company had to be publicly-owned with publicly-traded stock;
- The selected company had to be recognized by investors as reflective of the risks of natural gas pipelines, own one or more FERC-regulated interstate natural gas pipelines, and have stock tracked by an investment information service (such as Value Line); and
- Natural gas pipeline operations had to constitute a high proportion of the company's business, where "high" means that pipeline operations have accounted for at least 50 percent of the company's assets or 50

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5 *Composition of Proxy Groups for Determining Gas and Oil Pipeline Return on Equity,* 123 FERC ¶ 61,048 (2008) ("*Proxy Group Policy Statement*").

6 *Id*. at P 42, 49-51.

7 This view was qualified in *Kern River*, Opinion No. 486-B, 126 FERC ¶ 61,034 at P 104: "[W]hile the Commission agrees that adding more members to the proxy group results in greater statistical accuracy, this is true only if the additional members are appropriately included in the proxy group as representative firms."

> percent of their operating income, or both, on average over the most recent three-year period.

Application of these criteria, however, resulted in ever-smaller proxy groups to the point that any resulting proxy group would be of questionable reliability. At the time, MLPs were not included in the proxy group based on concerns about the applicability of the DCF model to the MLP organizational structure and cash distribution patterns. Thus, the Commission ultimately accepted the proposal to expand the sample to nine companies based on the Diversified Natural Gas industry group generated by Value Line Investment Survey, all of which owned FERC-regulated natural gas pipelines.

Although the requirement to have at least 50 percent of operations concentrated in the natural gas pipeline industry was relaxed in *Williston Basin*, and thereby provided a temporary solution to the shrinking sample problem, it proved insufficient in subsequent proceedings. Mergers and acquisitions in the industry and the growing trend of forming MLPs to invest in pipeline assets continued to result in smaller samples even under the revised selection criteria. Subsequent decisions in *High Island Offshore System, L.L.C.*, 110 FERC ¶ 61,043 at PP 117-18 (2005) ("*HIOS*"),[8] and *Kern River Gas Transmission Co.*, 117 FERC ¶ 61,077 at PP 139-40, 161 (2006) ("*Kern River*"), left the Commission with a four-company proxy group even under the revised criteria.

Following a technical conference in 2007, the Commission issued the *Proxy Group Policy Statement*, which determined that the DCF method could be applied to MLPs as well as to corporations, but specified that the long-term growth rate used in the two-step DCF

[8] *Id*. at P 124.

calculation for MLP proxy group members would be one half the expected long-term future rate of the U.S. Gross Domestic Product ("GDP") growth, rather that the full GDP growth rate.[9]

Q16: How has the situation changed since the *Proxy Group Policy Statement* was issued?

A16: At the time the *Proxy Group Policy Statement* was issued, the ability to include MLPs in the proxy group generally made it possible to select a reasonably large sample of companies meeting the Commission's other criteria for inclusion in a natural gas pipeline sample (*i.e.*, publicly-traded companies with investment-grade bond ratings and the majority of their business activities consisting of FERC-regulated natural gas pipeline operations). However, since that time, the midstream natural gas industry has developed in such a way that there are very few companies whose majority focus is on regulated interstate natural gas pipeline transportation.

Through organic growth and especially merger and acquisition, the publicly-traded holding companies that own interstate natural gas pipelines and storage systems have generally become diversified to include—among other business activities—(i) interstate pipeline transportation of natural gas liquids ("NGLs"), crude oil, and petroleum products (*i.e.*, "liquids pipelines"), (ii) intrastate natural gas and liquids pipelines, (iii) natural gas gathering systems, (iv) natural gas and NGL processing facilities, and (v) the provision of terminaling, marketing, and assorted other midstream natural gas and petroleum services.

Additionally, in recent years, several pipeline-owning MLP entities were acquired by corporate entities, including several that were "rolled up" by the corporations that served as

[9] *Proxy Group Policy Statement*, at P 42.

their general partners. Examples include the July 2018 acquisition of Boardwalk Pipeline Partners ("BWP") by diversified conglomerate Loews, which had controlled its general partner,[10] the August 2018 roll-up of Williams Partners ("WPZ") into Williams Companies, Inc. ("WMB"),[11] and the late 2018 acquisitions of U.S. MLPs Spectra Energy Partners ("SEP") and Enbridge Energy Partners ("EEP") by the Canadian corporation Enbridge, Inc.[12]

Q17: Is it necessary again to revise or relax certain of the Commission's traditional sample selection criteria to assemble a sample group for the current case?

A17: Yes. For the reasons stated above it is not possible to identify at least five proxy companies for which FERC-regulated interstate natural gas pipelines operations constitute a majority of their business activities (as measured by assets or operating income). In the *Pipeline Policy Statement*, the Commission has indicated its preference that proxy groups consist of at least four members and preferably five.[13] Therefore, to obtain a reasonably sized sample, I developed an Expanded Sample that relaxed this criterion by looking to include an additional company with a substantial proportion of its assets, property, plant and equipment ("PP&E"), or operating income from business activities in pipeline business (including liquids pipelines, crude oil pipelines as well as natural gas pipelines).[14] Using this approach, I was able to

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[10] *See* Loews to Buy Out Investors in Boardwalk Pipeline MLP, July 13, 2018. Accessible at https://www.barrons.com/articles/loews-to-buy-out-investors-in-boardwalk-pipeline-mlp-1531511536

[11] *See* Williams Completes Acquisition of Williams Partners, August 10, 2018. Accessible at https://investor.williams.com/press-release/williams/williams-completes-acquisition-williams-partners

[12] *See* Enbridge Inc. and Spectra Energy Partners, LP Complete Merger, December 17, 2018; and Enbridge Inc. Completes Mergers with Enbridge Energy Partners, L.P. and Enbridge Energy Management, L.L.C., December 20, 2018. Accessible at https://www.enbridge.com/media-center/news

[13] *See* note 3 *supra*.

[14] Different companies report different disaggregated financial metrics for their various business segments. Depending on the company, a percentage of "assets" may refer to gross original cost of total assets on the balance sheet or to gross or net balances of long-lived property, plant, and equipment ("PP&E") assets. Similarly, my analysis of income and cash flows is in certain cases expanded to include reported data on EBITDA ("Earnings Before Interest, Taxes, Depreciation and Amortization") and gross operating margin, as well as operating income (often defined to be synonymous with EBIT – Earnings Before Interest and Taxes).

select a Core Sample of four companies that are substantially devoted to rate-regulated natural gas transportation operations and whose broader business profiles—including rate-regulated natural gas gathering and distribution of natural gas, operation of rate-regulated liquids pipelines, and provision of fee-based natural gas and NGL gathering and processing services—I believe make them generally risk appropriate for evaluating Southern Star's cost of capital.

To develop a sample consisting of at least five companies, I consider a broader Expanded Sample consisting of four Core Sample companies and an additional fifth company that operates substantial amount of FERC-regulated pipeline assets (including liquids pipelines as well as natural gas pipelines). In addition to providing five companies for constructing a reasonably sized sample, the Expanded Sample also serves as a check on the Core Sample, and thus, reinforces the results of my analysis.

Q18: In considering regulated pipeline operations other than FERC-regulated natural gas transmission, are you assuming that all categories of regulated pipelines have identical risk for cost of capital purposes?

A18: No. It is not even the case that all natural gas pipeline companies have identical risk. However, I do believe that the inclusion of companies with a substantial percentage of pipeline assets under rate regulation is the best possible indicator of the risk of a natural gas pipeline such as Southern Star. For clarity, I am not arguing that the risks of different classes of FERC pipelines are identical. Rather it is my opinion that, relative to other types of business activities that potential sample companies may engage in, rate-regulated gas or liquids transportation activities, be they under FERC, state, or Canadian Energy Regulator jurisdiction, are likely to be the most risk comparable for purposes of assessing Southern Star's cost of capital with a reasonably sized sample.

2. Sample Selection Process

Q19: Please explain how you select a sample that is consistent with the Commission's precedent for estimating a gas pipeline's cost of capital.

A19: Consistent with the *Proxy Group Policy Statement*, I consider both C-Corporations and MLPs for inclusion in my sample. I began with the lists of all companies categorized by Value Line as (i) "Gas or Oil Distribution," or (ii) "Pipeline MLPs in the U.S." This group was narrowed to only include companies that meet the following criteria:

1. The company's stock is publicly traded and has been for the most recent six-month period;
2. The company pays dividends and has done so during the last six months without any cuts to its dividends;[15]
3. The company has a majority of its credit ratings at an investment-grade level;
4. The company has had no significant amount of completed merger and acquisition ("M&A") activity over the last six months;
5. The company must have at least $300 million in Market Capitalization;
6. The company must have FERC-regulated pipeline assets, and meet the business activity segmentation criteria described in the preceding subsection (1) for final selection into the Core and Expanded Samples.

Criteria 1 and 2 are necessary for the implementation of the DCF model. Criteria 3 and 4 ensure that there are no recent impacts from either potential financial distress situations or M&A activities. Criterion 5 eliminates companies that are too small to provide meaningful comparable data.[16]

As discussed above, Criterion 6 intends to capture the risk of the natural gas pipeline industry. This criterion requires me to investigate the companies' business descriptions and financial

[15] The Commission's traditional DCF methodology requires only six months of historical data to compute the cost of equity for each comparable company.

[16] In this case, no company was eliminated due to Criterion 5.

statement disclosure to assess whether sufficient assets, revenue or income is devoted to natural gas transportation or at least regulated activities. Specifically, if a company has operations outside the natural gas transportation business, I examine the nature of such business and favor regulated activities over non-regulated activities. For example, to expand the sample, I give preference to regulated liquids pipeline activities over oil and gas exploration and production activities because the former is subject to rate of return regulation while the latter is not.

Q20: Please specifically describe how you applied the criteria outlined above to select your sample companies.

A20: I began with 47 companies listed in the two relevant Value Line categories. First, I eliminated 24 companies that either do not regularly pay dividends or had a dividend cut during the six months leading up to the study date, leaving 23 companies as the subject of further screening. Next, I eliminated 12 companies that have non-investment grade credit ratings, leaving 11 potential sample companies after this step of the sample selection process.[17] One of the remaining companies was eliminated due to M&A activity.[18] None of the remaining 10 companies were eliminated because of their market capitalization, Criterion 5.

[17] At this stage, I also eliminate companies for which I cannot procure credit ratings through any of the major ratings agencies: Standard and Poor's ("S&P"), Moody's Analytics ("Moody's") and Fitch Ratings ("Fitch").

[18] I elected to remove Enable Midstream from my sample due to the announced acquisition by Energy Transfer on February 17th 2021, even though this occurred after the study date. https://www.businesswire.com/news/home/20210217005332/en/Energy-Transfer-to-Acquire-Enable-Midstream-in-7-Billion-All-Equity-Transaction

Figure 4
Sample Selection Elimination Summary

Value Line Company Universe	[a]	47
Eliminated due to Dividend Cuts	[b]	24
Elimiminated due to Bond Ratings	[c]	12
Eliminated due to M&A	[d]	1
Eliminated due to Market Cap	[e]	0
Eliminated due to Asset Composition	[f]	5
Prospective Sample Companies	[g]	5

For these 10 remaining companies, I reviewed their business descriptions and segmented financial data from their 2020 Annual Reports and selected companies meeting the business segmentation discussed above. Figure 5, below, summarizes the percentages of their assets and earnings (e.g., EBITDA) that I estimated are dedicated to (i) regulated natural gas pipeline operations and (ii) rate-regulated activities more broadly.

Figure 5
Sample Regulated Assets and EBITDA Summary

	Assets		EBITDA	
Company	Regulated Natural Gas Pipeline Operations	Total Regulated Business Activities	Regulated Natural Gas Pipeline Operations	Total Regulated Business Activities
	[1]	[2]	[3]	[4]
Enbridge Inc.	27%	96%	10%	97%
Kinder Morgan Inc.	71%	84%	67%	86%
TC Energy Co.	77%	95%	75%	93%
Williams Cos.	45%	51%	33%	33%
Enterprise Products	18%	55%	11%	54%

Sources and Notes: See Thapa Testimony, Exhibit SSC-0009, Tables 1 and 2 for Assets and EBITDA, respectively. Total Regulated Business Activities calculated as sum of Gas Pipelines & Storage, Oil and Liquids Pipelines, Gas Distribution columns.

Companies that did not engage substantially in rate-regulated natural gas and/or liquids transportation activities, as well as companies that engaged predominantly in businesses with very different risk profiles (such as oil and gas exploration and production, petroleum refining, fuels distribution, electric utility service, or non-energy-related businesses) were excluded. Five companies were excluded due to asset composition. In the end, the sample selection process resulted in five prospective sample companies.

Q21: How do the Core and Expanded Sample compare to Southern Star?

A21: Like Southern Star, the Core Sample has substantial pipeline transportation assets that are regulated by FERC. As shown in Figure 5 above, regulated natural gas pipeline operations comprise an average of 55 percent of the Core Sample's assets and an average of 46 percent of their EBITDA.

The Expanded Sample, which adds Enterprise Products as the fifth company to the four-company Core Sample, similarly includes companies with a substantial percentage of pipeline assets under rate regulation, providing a comparable indicator of the risk for natural gas pipeline such as Southern Star. Enterprise Products comprises 55 percent of assets dedicated to regulated business activities. Similarly, 54 percent of its EBITDA comes from its regulated business operations. Additionally, Enterprise Products generated 87 percent of its 2020 operating income from Pipelines & Services segment, even though majority of those are from natural gas liquid and crude oil Pipelines and Services segment.[19] But importantly, only about 13 percent of the Company's 2020 operating income was generated by non-pipeline related Petrochemical & Refined Products Services segment.[20] Because a substantial proportion of

[19] Enterprise Products Partners L.P. 2019 Form 10-K, p. 82.

[20] *Id.*

the company's operating income is generated from business activities in Pipelines & Services business (including liquids pipelines, crude oil pipelines as well as natural gas pipelines), and for the reasons I delineated above regarding achieving a reasonably sized sample, I find it appropriate to include Enterprise Products as the fifth sample company in my Expanded Sample.

As discussed in the Thapa Testimony, the main business activities of the Core Sample is natural gas pipelines and storage, with a lesser amount of non-regulated business activities (such as midstream services).[21] Therefore, the Core Sample faces similar types of business risk as those of Southern Star. Mr. Thapa then evaluates a variety of business risks, including the contract coverage for the each of the Core Sample companies as well as the operational risks related to each company's maintenance capital and modernization expenditures.[22] Based on this information as well as an analysis of the competition risk, Mr. Thapa concludes that Southern Star faces higher business risk than the median of my Core Sample.[23] Mr. Thapa concludes that Southern Star has a lower level of contract cover relative to pipelines in the proxy group sample. It also faces a higher degree of de-contracting and remarketing risk due to reliance on large customers, one of which is actively pursuing options to bypass the Southern Star system. In addition, Mr. Thapa concludes that Southern Star also faces higher operating risk as evidenced by its more significant maintenance capital and modernization expenditures compared to other pipelines in the proxy group sample.[24]

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21 Thapa Testimony, Exhibit No. SSC-0009, Section V.A

22 *Id.*, Section V.B

23 *Id.,* Section VI

24 *Id.*

Q22: Please explain why your Sample includes Kinder Morgan Inc. and Enterprise Products—both of which currently have negative *IBES* Consensus Mean Growth Rates—when valid DCF estimates cannot be calculated with the negative *IBES* growth rates?

A22: A sample of proxy companies employed for cost of capital estimation must comprise a sufficiently large group of comparable companies whose risks are commensurate with that of the subject company. Because the cost of capital is not directly observable, it needs to be estimated from such a group of risk-commensurate proxy companies. However, once an appropriate risk-commensurate sample has been developed, the sample itself does not change because a specific modeling input—such as the forecasted earnings growth rate for a sample company is temporarily unavailable. The sample, which should be sufficiently large to provide confidence in the statistical robustness of the estimation, simply reflects the group of comparable companies whose risks are commensurate with that of the subject company. While it may be that certain required modeling inputs for a specific ROE estimation model (*e.g.*, DCF) is temporarily unavailable for any sample company, so that the ROE for that sample company cannot be estimated by using that specific model at this time. However, this does not mean that a sample company needs to be dropped from the sample. Doing so would impact the sample composition by not only reducing a risk-commensurate sample company, but also by potentially affecting the average risk profile of the remaining sample, especially when the remaining sample may comprise just three or four companies. Such a small sample could make the estimated ROE less robust. Rather, alternative sources for the missing input data should be employed to estimate the ROE.

In the case of Kinder Morgan, a regulated pipeline company with most of its business activities in the natural gas pipeline business, currently the IBES forecast for the earnings growth rate is negative. Using a negative growth rate in the DCF model is not valid. Instead

of dropping Kinder Morgan from the DCF sample due to lack of such input data from a specific source, I employ a valid alternate source for the earnings growth rate forecast to allow for the implementation of the DCF model. Specifically, I implemented the DCF model using a combination of the *IBES* and Value Line growth rates, when a *negative IBES* growth rate for a company is reported (Value Line reports positive-growth rate forecasts for the sample companies for my analysis period). *I.e.*, I combine the negative growth rate from IBES with the positive growth rate from Value Line to obtain a valid input to the DCF model. Doing so allowed me to produce a valid DCF estimate for Kinder Morgan as well as for Enterprise products, which suffers from the same data issue.

Additionally, I also implement the CAPM model for these two companies as the *IBES* negative earnings growth projections have no bearing on the implementation of the CAPM model. This is another reason to not drop a risk-commensurate sample company simply because one modeling input is temporarily unavailable (or currently incompatible) for implementing one of the two models used for ROE estimation using the Commission's revised methodology.

B. The Commission's DCF Methodology and Input Parameters for DCF Calculation

a. The Commission's Revised DCF Calculation

Q23: Please describe the Commission's estimation methodology.

A23: In the *Pipeline Policy Statement*, the Commission maintained its traditional DCF model, which places 2/3 weight on company-specific growth rates and 1/3 weight on the economy-wide growth rate. Previously, the *Proxy Group Policy Statement* essentially re-affirmed the Commission's DCF methodology as articulated in prior decisions such as *Williston Basin*,

Kern River, and *HIOS,* but outlined a modification in the case of MLPs, which were now permitted to be included in the sample. The one modification indicated for MLPs was to reduce the estimated long-term growth rate to one-half of the long-term GDP growth forecast instead of the full amount of the GDP growth rate forecast used for the C-corporations in the sample.[25]

Q24: Please describe the details of the DCF model used by the Commission to establish the "range of reasonableness".

A24: As noted earlier, the Commission's DCF model is a modification of the standard, constant-growth DCF model, where the dividend growth rate is a weighted-average of the company's 5-year analyst growth rate estimates (⅔ weight), such as those provided by *IBES* or Bloomberg, plus a common long-term growth rate estimate of the GDP (⅓ weight). Details of the approach are articulated in *Kern River*, as well as in *Williston Basin* and *Enbridge Pipelines (KPC)* ("*Enbridge*"). As the Commission stated in *Enbridge*:

> The Commission uses the Discounted Cash-Flow (DCF) methodology when calculating a range of reasonable rates of return on equity for natural gas pipelines. Under that methodology, the rate of return equals the dividend yield (stock price divided by dividends), plus the projected growth in dividends.
>
> For natural gas pipelines, the Commission uses a two-step procedure to determine the projected growth in dividends of the proxy group companies, averaging short-term and long-term growth estimates. The Commission uses five-year Institutional Broker's Estimate System (I/B/E/S) growth projections for each proxy group company for the short-term growth projection. The Commission uses the growth rate of the Gross Domestic Product (GDP) as its long-term growth rate, since the Commission has found that pipeline specific projections of long-term growth cannot reasonably be developed based on available data sources. The Commission averages these growth projections, giving two-thirds weight to the short-term growth projection and one-third weight to the long-term growth projection.[26]

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[25] *Proxy Group Policy Statement* at P 96.

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

In formulating the DCF model, the Commission further adds an adjustment to the dividend yield term resulting in the Commission's DCF cost of capital equation. As explained by Commission Staff, the formula is:[27]

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

Where k is the return on equity, D_0 is the current dividend, P is the share price variable, and g is the growth rate. The growth rate was assumed to be a composite long-term and short-term growth rate.

Q25: Has the Commission made any adjustments to the DCF model?

A25: Yes, Opinion No. 569 made a distinction between the growth rate applied to the first dividend and that applied to later dividends in the DCF formula. According to Opinion No. 569:

> Because the first dividend is necessarily paid within the time-period covered by the IBES short-term growth projection, that rate is the more appropriate growth rate for calculating the (1+.5g) adjustment to the dividend yield.[28].

This determination from Opinion No. 569 was adopted in the *Pipeline Policy Statement*. Therefore, I adjust the formula so that the first growth rate (*i.e.*, the g in (1+½g)) reflects the short-term growth rates. The amended DCF formula is as follows:

$$k = \frac{D_0 \times \left(1 + \frac{1}{2}g_1\right)}{P} + g_2$$

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

[28] *Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.*, Opinion No. 569, 169 FERC ¶ 61,129 at P 98 (2019).

Where g_1 is the short-term growth rate and g_2 is the composite growth rate.[29] In keeping with the *Pipeline Policy Statement*, the composite long-term growth rate (g_2) is weighted two-thirds on the short-term *IBES* growth rate estimates and one-third on long-term nominal GDP growth forecasts.[30] For MLPs, the *Proxy Group Policy Statement* prescribes the use of ½ of the GDP growth rate forecast instead of the full amount as the long-term growth rate.

Q26: How is the dividend yield determined?

A26: The Commission has established a very specific procedure for calculating the dividend yield to use in the DCF formula. Specifically, the "current" dividend yield is to be computed using the prior six months of dividend and price data. One first records the highest and lowest trading price during the month for each of the prior six months. The current dividend for each quarter is annualized (*i.e.*, multiplied by 4) and then divided by the average of these two prices (the highest and lowest trading price during each month) to produce six monthly dividend yields. Averaging these six dividend yields produces an unadjusted dividend yield for each company as of today. To obtain the dividend yield for the next period, which is what is used in the FERC's DCF model, today's dividend yield (D_0/P) is multiplied by:

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

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

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[29] For MLPs, the *Pipeline Policy Statement* prescribes the use of ½ of the GDP growth rate forecast instead of the full amount as the long-term growth rate.

[30] Per the *Pipeline Policy Statement*, P 6 n.7, the GDP forecast is based on the long-term GDP forecast produced by the Social Security Administration, the Energy Information Administration, and Global Insight.

Q27: Why is only one-half of the growth rate used to set the dividend yield in the Commission's traditional DCF methodology?

A27: The Commission has chosen this implementation as an adjustment for the timing in how dividends are paid and the fact that they are paid quarterly. I disagree with the use of the 0.5 multiplier for the initial growth rate as a matter of economic principle because it violates the basic assumptions of the DCF model. The DCF model is derived under the assumption that dividends grow at the full growth rate for the period. However, because it is the Commission's traditional approach to calculating the DCF model, my calculations follow the Commission's precedent and use this version of the dividend yield in the DCF model.

1. *IBES* Growth Rate Inputs

Q28: How do you obtain the *IBES* growth rates?

A28: I downloaded them from Thomson ONE—a third-party data platform provided by Thomson Reuters—using the Thomson Reuters Spreadsheet Link ("TRSL") plug-in for Microsoft Excel.

Q29: How does Thomson Reuters update *IBES* growth rates over time?

A29: Thomson Reuters tracks 3- to 5-year earnings growth rate estimates submitted by equity analysts who cover a specific company, and calculates the consensus earnings per share ("EPS") growth rate estimate as the average of the growth rates reported by the individual analysts. *IBES* communicates with the analysts and assembles their submissions to maintain as up-to-date a value for the consensus growth rate as possible at any point in time.

Q30: Is there sometimes a difference between *IBES* growth rates reported by *Yahoo! Finance* and Thomson Reuters?

A30: Yes. Although I do not know the exact reasons, estimates reported by *Yahoo! Finance* may be "stale" in that, if there are no currently available valid estimates, *Yahoo! Finance* could continue to report an estimate that has been removed by Thomson Reuters as out of date.

Q31: How have growth rates for the Core and Expanded Sample changed over time?

A31: The *IBES* 5-year growth rates forecasts for the companies in both the Core Sample and the Expanded Sample have been highly volatile. There are two primary drivers of the observed volatility. First, there are only a few analysts—often no more than one or two—tracking each sample company. Second, individual analysts' forecasts can be updated as infrequently as every six months. When only a few analysts (fewer than three in most cases for the selected Core and Expanded Samples) forecast a company's growth rate, even a change in a single analyst's forecast can alter the consensus growth rate estimate substantially.

Q32: In your opinion, are the *IBES* growth rate forecasts reliable?

A32: Generally, yes. The brokers and equity analysts who contribute estimates to *IBES* are in general knowledgeable about the companies they cover, and their views are visible to and frequently cited by the investment community. Furthermore, *IBES* has a long history of gathering the contributed estimates and a reputation for doing so according to consistent standards. I therefore believe that the EPS growth rate estimates aggregated and reported by *IBES* provide useful information about the market expectation regarding the growth prospects of the sample companies.

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

Q33: How did your DCF-based cost of equity incorporate *IBES* growth rates?

A33: As specified in the *Pipeline Policy Statement*, I implemented the traditional FERC DCF model using *IBES* growth rates, when possible. However, I note that one of my four Core Sample companies has a negative *IBES* growth rate as of the analysis period. This causes the DCF model to produce only three ROE estimates for the four-company Core Sample (and three ROE estimates for the five-company Expanded Sample). Because only three estimates for the DCF model are too few (and also one fewer estimate than CAPM), I implemented the model using a combination of the *IBES* and Value Line growth rates when a *negative IBES* growth rate for a company is reported. Doing so allowed me to produce a valid DCF estimate for two additional companies—one in the Core Sample, and two in the Expanded Sample—that otherwise would not result in any DCF estimates. Specifically, in my analysis using both *IBES* and Value Line growth rates I assign equal weight to each analyst, so that the *IBES* growth rate is weighted by the number of analysts providing an estimate, while Value Line's estimates is treated as one analyst. Thus, the total number of analysts is the number providing an *IBES* estimate plus one.[31] Adding Value Line to the earnings growth forecasts used in the DCF model increases the number of analysts providing growth rates, which is beneficial. It is always preferable to have additional observations (*i.e.*, a consensus), because the broader coverage a company has, the better it reflects equity investors' perspective.

Additionally, the Value Line analysts update their reports on a strict 13-week schedule so the forecast will never be older than 13 weeks. The reliability of Value Line's quarterly review

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

schedule is a key benefit of using Value Line EPS growth forecasts alongside the *IBES* estimates, given that (as mentioned above) the Thomson Reuters *IBES* consensus growth rates can include estimates that may not have been updated for 6 months or more.

C. The Capital Asset Pricing Model

Q34: Can you explain the CAPM?

A34: Yes. The CAPM is a long-standing and widely used version of modern finance models. The model requires the specification of the values of the benchmarks that determine the Security Market Line (see Figure 3 above). The CAPM specifies the relationship as being determined by the risk-free rate, the market risk premium and the relative risk of a security or investment (*i.e.*, beta). More precisely, the CAPM calculates the cost of capital for an investment, (*e.g.*, a particular common stock) as follows:

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

Where r_s is the cost of capital for investment S;

r_f is the risk-free interest rate;
β_s is the beta risk measure for the investment S; and
MRP is the market risk premium.

The CAPM relies on the empirical fact that investors price risky securities to offer a higher expected rate of return than safe securities. The higher the systematic risk, the greater is the expected return.[32] Thus, the CAPM states that the Security Market Line starts at the risk-free interest rate (that is the return on a zero-risk security, the y-axis intercept in Figure 3, equals the risk-free interest rate). Further, the risk premium of a security over the risk-free rate

[32] See Section II above.

equals the product of the beta of that security and the risk premium on a value-weighted portfolio of all investments, which by definition has average risk.

1. The Risk-free Interest Rate

Q35: What interest rates do your calculations require?

A35: Modern capital market theories of risk and return (*e.g.*, the theoretical version of the CAPM as originally developed) use the short-term risk-free rate of return as the starting benchmark, but the FERC methodology relies upon the version of the model that is based upon the long-term risk-free rate. Using a long-term estimate of the risk-free interest rate mitigates the volatility of short-term interest rates. In addition, long-term rates are less amenable to monetary policy driven changes by the Federal Reserve in its efforts to manage economic growth and expected inflation than short-term interest rates.

Q36: What interest rate do you use in your implementation of the CAPM?

A36: I have implemented CAPM consistent with the methodology and inputs specified in the *Pipeline Policy Statement*. Therefore, the interest rate used in my analysis is the average yield on a 30-year Treasury bond over the six months preceding the date of analysis of January 31, 2021.

2. The Market Risk Premium

Q37: How should the MRP be estimated per the Commission's *Pipeline Policy Statement* and Opinion No. 569-A?

A37: Per the *Pipeline Policy Statement*, the MRP is calculated by implementing a single-stage DCF model for the dividend paying S&P 500 companies with analyst growth rate forecasts for

earnings per share between zero and 20 percent (inclusive).[33] For growth rate forecasts, I have relied on Value Line projected EPS growth rates, consistent with the Commission's statements that it will consider Value Line growth rate estimates to diversify data sources.[34] I agree with the Commission's rationales for using Value Line growth rates in the CAPM. Specifically, the following:

(1) "Value Line estimates . . . are vetted through internal processes . . . and thus incorporate the input of multiple analysts;"[35]

(2) "there is…value in including Value Line projections because they are updated on a more predictable basis;"[36]

(3) "diversifying data sources may better reflect the data sources that investors consider in making investment decisions and mitigate the effect of any unusual or incorrect data in a given source;"[37] and

(4) "there is substantial evidence that *Value Line* is used by numerous investors."[38]

I also present results for the CAPM using the MRP based upon the consensus analyst estimates reported by *IBES*. I present the results of this additional CAPM growth rate projection scenario as an additional reference.

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[33] *Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.*, Opinion No. 569-A, 171 FERC ¶ 61,154 at p.15 (2020).

[34] *Id*. at p.40.

[35] *Id.* at 39-40.

[36] *Id.*

[37] *Id.*

[38] *Id.*

In keeping with the Commission's specification, any companies with Value Line growth rates (or *IBES* growth forecasts in the *IBES* scenario) that are negative or greater than 20 percent are excluded. I then calculate the expected market return by taking the sum of the market-value weighted-average of the next twelve-month Value Line reported dividend yield for the dividend paying S&P 500 companies with zero to 20 percent Value Line (or *IBES*) growth rate forecasts, and the market-value weighted-average of the Value Line growth rate forecasts (or *IBES* growth rates) for the same subset of S&P 500 companies. Finally, to derive the MRP, I subtract the 6-month historical average interest rate on 30-year Treasury bonds.

Q38: What MRP did you estimate?

A38: Using the method in the *Pipeline Policy Statement*, I estimated the MRP to be 10.14 percent (based on Value Line growth rate projections). For the alternative CAPM scenario, based on *IBES* growth rate projections, the estimated MRP is 10.78 percent.

3. Beta

Q39: What is the source of your beta estimates?

A39: The *Pipeline Policy Statement* specifies that the beta estimates for the sample companies should be accessed from Value Line. As such, I use Value Line as the source of my beta estimates.

Q40: Can you more fully explain beta?

A40: The basic idea behind beta is that risks that cannot be diversified away in large portfolios matter more than those that can be eliminated by diversification. Beta is a measure of the risks that cannot be eliminated by diversification. That is, it measures the "systematic" risk of a stock---the extent to which a stock's value fluctuates more or less than average when the market fluctuates.

Diversification is a vital concept in the study of risk and return. (Harry Markowitz won a Nobel Prize for work showing just how important it was.[39]) Over the long run, the rate of return on the stock market has a very high standard deviation, on the order of 20 percent per year. Many individual stocks have much higher standard deviations than this. The stock market's standard deviation is "only" about 15-20 percent over the long term because when stocks are combined into portfolios, some of the risk of individual stocks is eliminated by diversification. Some stocks go up when others go down, and the average portfolio return—whether positive or negative—is usually less extreme than that of many individual stocks within it.[40] The part of the risk that an investor cannot eliminate through diversification is called systematic risk (or non-diversifiable risk) and in practice the return on stocks is positively correlated. The reason is that many factors that make a particular stock go up or down also affect other stocks. Examples include the state of the economy, the balance of trade, and inflation.

Single-factor equity risk premium models (such as the CAPM) are based upon the assumption that all of the systematic factors that affect stock returns can be considered simultaneously, through their impact on one factor: the market portfolio. Other models derive somewhat less restrictive conditions under which several factors might be individually relevant.

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

[40] In any given year, the stock market volatility may be smaller or larger. For example, stock market volatility (VIX Index) during 2020 was approximately 29.20 compared to the long-term average of 19.5 (1990-2020 daily average).

Q41: What does a particular value of beta signify?

A41: By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk: it goes up or down by 10 percent on average when the market goes up or down by 10 percent. Stocks with betas above 1.0 exaggerate the swings in the market: stocks with betas of 2.0 tend to fall 20 percent when the market falls 10 percent, for example. Stocks with betas below 1.0 are less volatile than the market and stocks with a beta above 1.0 are more volatile than the market. For example, a stock with a beta of 0.5 will tend to rise 5 percent when the market rises 10 percent.

4. Size Adjustment

Q42: What is the size adjustment?

A42: The size adjustment is a modification to the CAPM estimates based upon empirical evidence from academic studies documenting a difference between a company's theoretical return as estimated by the CAPM and its realized return. The difference is a function of the size of the entity, where size is measured by its market value capitalization. The size adjustment applied to the CAPM estimates is reported by Duff & Phelps and varies with decile. The smallest decile of companies requires the largest addition to the expected return estimated to depend solely on beta, while stocks in the largest decile have actually shown an empirical tendency to return *less* than the rate of return predicted by applying the CAPM equation to its beta; hence, companies with very large market capitalizations actually receive a downward adjustment. I employed the size adjustment data reported by Duff & Phelps' *Cost of Capital Navigator* for January 31, 2021.

5. Zone of Reasonableness

Q43: Explain the zone of reasonableness.

A43: The first step in setting a new just and reasonable ROE is to calculate the overall composite zone of reasonableness. Note that the DCF and CAPM models produce estimates of the ROE for individual sample companies. The range of maximum and minimum estimates from each model is the starting point for ultimately evaluating the overall composite zone of reasonableness,[41] and subsequently, the just and reasonable ROE for Southern Star. According to the *Pipeline Policy Statement*, "[t]he range of the proxy group's returns produces the zone of reasonableness in which the pipeline's ROE may be set based on specific risks."[42]

I calculated the overall composite zone of reasonableness ("ZOR") based on the individual ZORs of the CAPM and DCF models. The overall composite ZOR is calculated by averaging the ZOR results from the CAPM and DCF models.

Q44: How do you determine the precise ROE within this overall composite zone of reasonableness?

A44: The *Pipeline Policy Statement* affirms that the Commission's policy is to rely upon median ROE results other than in unusual circumstances where a pipeline faces anomalously high or low risks.[43] Southern Star witness Thapa provides an analysis of the key business risks of Southern Star relative to the sample companies. This includes an analysis of supply risk, demand (or market) risk, competitive risk, operating risk, and regulatory risk. The Thapa

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[41] According to the *Pipeline Policy Statement*, any outliers will be addressed "on a case-by-case basis in accordance with our policy to remove 'anomalous' or 'illogical' cost-of-equity estimates that do not provide meaningful indicia of the returns that the pipeline needs to attract capital from the market." *Pipeline Policy Statement* at P 87.

[42] *Pipeline Policy Statement* at P 6.

[43] *Id.*

Testimony demonstrates that the company faces higher than average business risk compared to the pipelines in the Core Sample.[44]

To adjust for the higher business risk identified in the testimony of Mr. Thapa, I base my recommended ROE at the median of the upper-third of the overall composite zone of reasonableness. The range of estimates in the upper-third of the overall composite zone of reasonableness reflects the applicable range for above-average risk companies, such as Southern Star, according to Opinion No. 569-A.[45]

IV. RESULTS FROM ROE ESTIMATION MODELS

A. DCF Results

Q45: What are your results from your implementation of the Commission's DCF model?

A45: The results of my implementation of the Commission's DCF model for my Core and Expanded Sample using the IBES short-term growth rate estimates are shown in Figure 6 below. The zone of reasonable estimates range from 8.8 percent to 14.8 percent. The Expanded Sample reflects the same zone of reasonableness as the Core Sample. Thus, the effect of including an additional company is to affirm my estimate.

[44] Thapa Testimony, Exhibit No. SSC-0009.

[45] *See* Opinion No. 569-A at PP 193-194.

Figure 6: Results from the DCF Method

Company	S&P Credit Rating	Dividend Yield	Adjusted Dividend Yield	GDP Growth Forecast	Growth Estimate	Combined Growth Rate	Implied Cost of Equity
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Enbridge Inc.	BBB+	7.83%	8.09%	4.23%	6.42%	5.69%	13.8%
Enterprise Products	BBB+	9.68%	9.86%	2.12%	3.75%	3.21%	13.1%
Kinder Morgan Inc.	BBB	7.72%	8.03%	4.23%	7.99%	6.74%	14.8%
TC Energy Corp.	BBB+	5.62%	5.69%	4.23%	2.61%	3.15%	8.8%
Williams Cos.	BBB	7.79%	7.98%	4.23%	5.00%	4.74%	12.7%
Core Sample						*Minimum*	*8.8%*
						Maximum	*14.8%*
Expanded Sample						*Minimum*	*8.8%*
						Maximum	*14.8%*

Sources and Notes:
[1],[2]: Bloomberg as of 1/31/2021.
[3] = [2] x (1.5 x [5]).
[4]: GDP halved for MLPs per Commission precedent.
[5] Uses IBES custom growth rate if the growth estimate is positive. If the IBES estimate is negative, the growth estimate reflects a weighted average growth rate of IBES and Value Line. If no IBES estimate exists, growth estimate reflects the Value Line growth rate.
[6]: {(1/3) x [4]} + {(2/3) x [5]}
[7]: [3] + [6]

Q46: Please explain the growth rates relied upon in Figure 66.

A46: Following the *Pipeline Policy Statement*, I rely on *IBES* growth rates when such rates are available. However, Kinder Morgan and Enterprise Products do not have positive growth rates from *IBES*. Therefore, to produce results for five (four) companies in the Expanded (Core) sample, I use an average of the negative IBES growth estimate and the positive Value Line estimate for Kinder Morgan and Enterprise Products. I acknowledge that the Commission has expressed a preference for *IBES* growth rates in the DCF model, but because I have positive *IBES* growth rates for only three companies, I rely on the combined *IBES* and Value Line growth rates for the remaining two companies in order to produce valid DCF results for them. This approach is conservative as I am using the negative *IBES* growth rate in combination with a positive growth rate projection from Value Line.

B. CAPM Results

Q47: Please summarize the return on equity results based on the CAPM model?

A47: The results of implementing the CAPM are displayed in Figure 7 and Figure 8 below. As shown in Figure 7 and Figure 8, the zone of reasonable ROE estimates for Southern Star based on the CAPM model, ranges from 11.1 percent to 17.7 percent (for IBES growth rate projections), and 10.5 percent to 16.8 percent (for *Value Line* growth rate projections), for both the Core and Expanded Samples.

Figure 7: Results from the CAPM (*Based on IBES Growth Rates)*

	Unadjusted Cost of Equity Estimate				Size Premium Adjustment		
Company	Risk Free Rate	Market Risk Premium	Value Line Beta	Unadjusted Cost of Equity	Market Cap ($ millions)	Size Adjustment	**Size Adjusted Cost of Equity**
	[1]	[2]	[3]	[4] = [1] + [2] x [3]	[5]	[6]	[7] = [4] + [6]
Enbridge Inc.	1.57%	10.78%	0.9	11.3%	$87,662	-0.2%	11.1%
Enterprise Products	1.57%	10.78%	1.1	13.4%	$45,251	-0.2%	13.2%
Kinder Morgan Inc.	1.57%	10.78%	1.25	15.0%	$33,549	-0.2%	14.8%
TC Energy Corp.	1.57%	10.78%	1.05	12.9%	$40,070	-0.2%	12.7%
Williams Cos.	1.57%	10.78%	1.45	17.2%	$25,728	0.5%	17.7%
Core Sample						Min	*11.1%*
						Max	*17.7%*
Expanded Sample						Min	*11.1%*
						Max	*17.7%*

Sources and Notes:
[1]: 6-month daily average of 30-year U.S. from St. Louis Federal Reserve Economic Data.
[2]: MRP calculations consistent with FERC guidelines, using IBES growth rates.
[3],[5]: Value Line Investment Analyzer as of 1/27/2021.
[6]: Duff & Phelps Cost of Capital Navigator as of 1/31/2021.

Figure 8: Results from the CAPM in the (*Based on Value Line Growth Rates)*

	Unadjusted Cost of Equity Estimate				Size Premium Adjustment		
Company	Risk Free Rate	Market Risk Premium	Value Line Beta	Unadjusted Cost of Equity	Market Cap ($ millions)	Size Adjustment	**Size Adjusted Cost of Equity**
	[1]	[2]	[3]	[4] = [1] + [2] x [3]	[5]	[6]	[7] = [4] + [6]
Enbridge Inc.	1.57%	10.14%	0.9	10.7%	$87,662	-0.2%	10.5%
Enterprise Products	1.57%	10.14%	1.1	12.7%	$45,251	-0.2%	12.5%
Kinder Morgan Inc.	1.57%	10.14%	1.25	14.2%	$33,549	-0.2%	14.0%
TC Energy Corp.	1.57%	10.14%	1.05	12.2%	$40,070	-0.2%	12.0%
Williams Cos.	1.57%	10.14%	1.45	16.3%	$25,728	0.5%	16.8%
Core Sample						Min	*10.5%*
						Max	*16.8%*
Expanded Sample						Min	*10.5%*
						Max	*16.8%*

Sources and Notes:
[1]: 6-month daily average of 30-year U.S. from St. Louis Federal Reserve Economic Data.
[2]: MRP calculations consistent with FERC guidelines, using Value Line growth rates.

[3],[5]: Value Line Investment Analyzer as of 1/27/2021.
[6]: Duff & Phelps Cost of Capital Navigator as of 1/31/2021.

C. Low-End Outlier Test

Q48: Does the *Pipeline Policy Statement* specify the application of an outlier test to CAPM and DCF results for the sample companies?

A48: Yes. For low-end outliers, the Commission requires the removal of DCF and CAPM estimates that are less than the Baa utility bond yield plus 20 percent of the estimated CAPM MRP. As detailed below, the low-end outlier test has support in basic financial theory: bonds are less risky than equity, and investors cannot be expected to purchase common stock if less risky bonds yield essentially the same or similar returns.

Q49: Were the DCF or CAPM results impacted by the commission's low-end threshold test?

A49: No. No DCF or CAPM estimates were eliminated due to the low-end screen of 5.17 percent (using Value Line growth projections), which was calculated as 20 percent of the Value Line based-MRP, plus the 6-month daily average yield of the Baa Utility bond.

D. The Composite Zone of Reasonableness Results

Q50: How did you use the DCF and CAPM cost of equity results to derive an estimate of the appropriate ROE for Southern Star?

A50: Figure 9 and Figure 10 below summarize the overall composite zone of reasonableness for Southern Star based on CAPM and DCF methodology results presented in the preceding sections of this testimony. As noted previously, the overall composite ZOR is calculated by averaging the ZOR results from the CAPM, and the DCF. Figure 9 and Figure 10 also report the three "risk ranges," applicable to Southern Star. These risk ranges are the upper, middle- and lower-third of the overall composite zone of reasonableness estimated for Southern Star. These risk ranges are calculated by dividing the overall composite zone of reasonableness into three equal portions, consistent with the *Pipeline Policy Statement*, and they reflect,

respectively, the applicable results for companies of Above Average, Average and Below Average risks.

Figure 9 and Figure 10 also show the Composite ZOR and median estimates based on both the Value Line and *IBES* growth rate CAPM scenarios. As shown, the overall composite zone for the Core Sample ranges from 9.7 percent to 15.8 percent with an upper risk range of 13.7 percent to 15.8 percent, and a median of 14.6 percent (under Value Line growth rate projections). These Core Sample results are supported by the Expanded Sample's composite zone results, as shown below in Figure 10.

Figure 9: Summary Results - Core Sample

		IBES DCF/IBES CAPM		*IBES DCF/VL CAPM*	
		Min	Max	Min	Max
DCF	[a]	8.8%	14.8%	8.8%	14.8%
CAPM	[b]	11.1%	17.7%	10.5%	16.8%
Composite Range	**[c]**	**9.9%**	**16.2%**	**9.7%**	**15.8%**
Zone of Reasonableness					
Upper Risk Range	[d]	14.1% - 16.2%		13.7% - 15.8%	
Central Tendency	[e]	15.0%		**14.6%**	
Median		*15.0%*		*14.6%*	
Upper Risk Midpoint		*15.2%*		*14.7%*	
Middle Risk Range	[f]	12.0% - 14.1%		11.7% - 13.7%	
Central Tendency	[g]	12.4%		12.1%	
Median		*12.4%*		*12.1%*	
Upper Risk Midpoint		*13.1%*		*12.7%*	
Lower Risk Range	[h]	9.9% - 12.0%		9.7% - 11.7%	
Central Tendency	[i]	10.8%		10.4%	
Median		*10.8%*		*10.4%*	
Upper Risk Midpoint		*11.0%*		*10.7%*	

Sources and Notes:
[c]: Composite range calculated based on simple average of DCF and CAPM range.
[d],[f],[h]: Calculated by dividing Composite Zone of Reasonableness into three equal parts.

[e],[g],[i]: Calculated as the median of the Composite results within the respective range.

Figure 10: Summary Results - Expanded Sample

		IBES DCF/IBES CAPM		*IBES DCF/ VL CAPM*	
		Min	Max	Min	Max
DCF	[a]	8.8%	14.8%	8.8%	14.8%
CAPM	[b]	11.1%	17.7%	10.5%	16.8%
Composite Range	**[c]**	**9.9%**	**16.2%**	**9.7%**	**15.8%**
Zone of Reasonableness					
Upper Risk Range	[d]	14.1% - 16.2%		13.7% - 15.8%	
Central Tendency	[e]	15.0%		**14.6%**	
Median		*15.0%*		*14.6%*	
Upper Risk Midpoint		*15.2%*		*14.7%*	
Middle Risk Range	[f]	12.0% - 14.1%		11.7% - 13.7%	
Central Tendency	[g]	12.8%		12.5%	
Median		*12.8%*		*12.5%*	
Upper Risk Midpoint		*13.1%*		*12.7%*	
Lower Risk Range	[h]	9.9% - 12.0%		9.7% - 11.7%	
Central Tendency	[i]	10.8%		10.4%	
Median		*10.8%*		*10.4%*	
Upper Risk Midpoint		*11.0%*		*10.7%*	

[c]: Composite range calculated based on simple average of DCF and CAPM range.
[d],[f],[h]: Calculated by dividing Composite Zone of Reasonableness into three equal parts.
[e],[g],[i]: Calculated as the median of the Composite results within the respective range.

Q51: What conclusions do you draw from these results?

A51: First, based on the analysis, I find that an ROE of 14.6 percent, reflecting the median of upper-third risk range, is consistent with the Commission's current ROE estimation methodology. This result is further supported by my Expanded Sample's upper-median ROE estimate of 14.6 percent.

Given Mr. Thapa's conclusion that Southern Star faces higher business risk than the median of the Core Sample, I find that my recommended ROE of 14.6 percent is appropriate. As

specified by the Commission in Opinion No. 569-A, it reflects the median estimate for above-average risk companies. Therefore, I recommend that Southern Star be allowed the opportunity to earn a ROE of 14.6 percent on its equity-financed portion of the Commission-regulated gas pipeline assets.

Q52: Does this conclude your direct testimony?

A52: Yes.

UNITED STATES OF AMERICA

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

Southern Star Central Gas Pipeline, Inc.	)	Docket No. RP21-___-000

STATE OF NORTH CAROLINA	)	
	)	SS.
COUNTY OF WILKES	)	

AFFIDAVIT OF BENTE VILLADSEN

Bente Villadsen, being first duly sworn according to law, on oath states that she is the Bente Villadsen whose testimony appears on the preceding pages entitled "Prepared Direct Testimony of Bente Villadsen" in Southern Star Central Gas Pipeline, Inc., Docket No. RP21-___ ; that, if asked the questions which appear in the text of said testimony, she would give the answers that are therein set forth; that the facts set forth therein are true and correct to the best of her knowledge, information, and belief; and that affiant adopts the aforesaid testimony as Bente Villadsen's sworn testimony in this proceeding.

Bente Villadsen

SWORN TO AND SUBSCRIBED BEFORE ME THIS 21st day of April 2021.

My Commission Expires:
04/21/2025

ALISHA MABE
NOTARY PUBLIC
My Comm. Exp. 04/21/25
WILKES COUNTY, NC