



**NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION**

June 10, 2022

Ms. A. Shonta Dunston, Chief Clerk
North Carolina Utilities Commission
Mail Service Center 4325
Raleigh, North Carolina 27699-4300

Re: Docket No. G-39, Sub 46 and G-39, Sub 47 – Cardinal Pipeline Company, LLC Depreciation Rate Study as of December 31, 2020, and Application of Cardinal Pipeline Company, LLC for an Adjustment in its Rates and Charges

Dear Ms. Dunston:

In connection with the above-captioned dockets, I transmit herewith for filing on behalf of the Public Staff the Public Version of the Direct Testimony and Exhibits of John R. Hinton.

By copy of this letter, we are forwarding copies to all parties of record.

Sincerely,

/s/ Gina C. Holt
Staff Attorney
gina.holt@psncuc.nc.gov

Attachments

cc: Parties of Record

Executive Director (919) 733-2435	Communications (919) 733-2810	Economic Research (919) 733-2902	Legal (919) 733-6110	Transportation (919) 733-7766
Accounting (919) 733-4279	Consumer Services (919) 733-9277	Electric (919) 733-2267	Natural Gas (919) 733-4326	Water (919) 733-5610

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JUN 10 2022

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. G-39, SUB 46
DOCKET NO. G-39, SUB 47

DOCKET NO. G-39, SUB 46)	
)	
In the Matter of)	
Cardinal Pipeline Company, LLC)	
Depreciation Rate Study as of)	TESTIMONY OF
December 31, 2020)	JOHN R. HINTON
)	ON BEHALF OF
DOCKET NO. G-39, SUB 47)	THE PUBLIC STAFF –
)	NORTH CAROLINA
In the Matter of)	UTILITIES COMMISSION
Application of Cardinal Pipeline)	
Company, LLC, for an Adjustment of)	
Rates and Charges in North Carolina)	
)	

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

**DOCKET NO. G-39, SUB 46
DOCKET NO. G-39, SUB 47**

TESTIMONY OF JOHN R. HINTON

**ON BEHALF OF THE PUBLIC STAFF
NORTH CAROLINA UTILITIES COMMISSION**

June 10, 2022

1 **Q. PLEASE STATE FOR THE RECORD YOUR NAME, BUSINESS**
2 **ADDRESS, AND PRESENT POSITION.**

3 A. My name is John R. Hinton. My business address is 430 North
4 Salisbury Street, Raleigh, North Carolina. I am the Director of the
5 Economic Research Division of the Public Staff - North Carolina
6 Utilities Commission. My qualifications are included in Appendix A to
7 this testimony.

8 **Q. PLEASE OUTLINE YOUR EDUCATIONAL BACKGROUND AND**
9 **RELEVANT EMPLOYMENT EXPERIENCE.**

10 A. I received a B.S. in Economics from the University of North Carolina at
11 Wilmington in 1980 and a Masters in Economics from North Carolina
12 State University in 1983. Since joining the Public Staff in May of 1985,
13 I have filed testimony on the long-range electrical energy and peak
14 forecasts, weather normalization for electrical energy, electric
15 generation certificate of public convenience and necessity
16 applications natural gas expansion projects, and the rate of return in

1 electric utility, natural gas utility and water utility rate cases as noted
2 in Appendix A.

3 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
4 **PROCEEDING?**

5 A. The purpose of my testimony is to present to the North Carolina Utilities
6 Commission (Commission) my findings and recommendations
7 regarding the reasonable cost of capital to be used in establishing rates
8 for Cardinal Pipeline Company, LLC (Cardinal or Company).

9 **Q. HOW IS YOUR TESTIMONY STRUCTURED?**

10 A. The remainder of my testimony is structured as follows:

11 I. Present Financial Conditions

12 II. Introduction and Cardinal Background

13 III. Capital Structure and Cost of Debt

14 IV. Cost of Common Equity Capital

15 V. Review of Company Witness Haag's Testimony

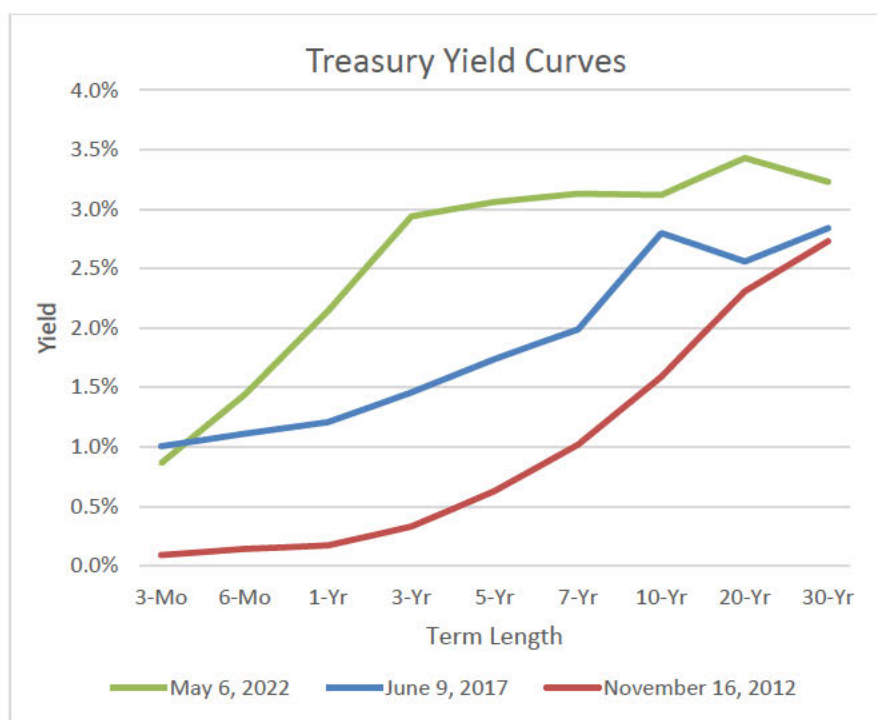
16 VI. Summary and Recommendation

17 **I. PRESENT FINANCIAL MARKET CONDITIONS**

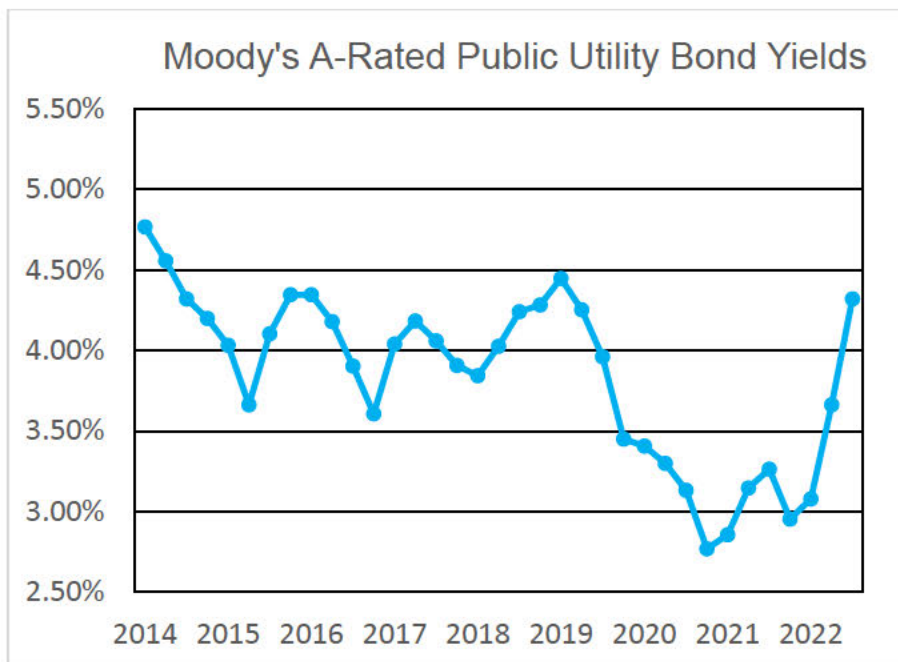
18 **Q. CAN YOU BRIEFLY DESCRIBE CURRENT FINANCIAL MARKET**
19 **CONDITIONS?**

20 A. Yes. As compared to the last thirty years there has been a resurgence
21 of inflation, which has contributed to an increase in inflationary

1 expectations and increases in interest rates. The changes in the U.S.
 2 Treasury bond yield curves illustrate differences in increases in interest
 3 rates over various terms. The largest increase in the difference from
 4 current yields compared to 2017 is with the three- and five-year terms,
 5 which are approximately 140 basis points greater than in 2017;
 6 however, the increases in the 30-year term U.S. Treasury bonds reflect
 7 an increase of approximately 40 basis points.



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 9 With particular importance to utility financings, yields on long-term “A”
 10 rated utility bonds as reported by Moody’s Bond Survey have increased
 11 to 4.75% for May 2022, as compared to 3.99% observed during July
 12 2017, which coincides with Cardinal’s 2017 rate case. The changes in
 13 the A-rated Public Utility bond yields are shown below:



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The economy for April 2022 is experiencing increases with annual inflation rates of 8.3%¹ that have not been observed since 1982. However, it is reasonable to believe that the above increases in utility bond yields reflect expected future inflation rates, and changes in the yield curve suggest that inflationary expectations are greater in the short term relative to longer term. I considered present market conditions and changing economic conditions in arriving at the Public Staff's recommended return on equity.

¹ U.S. Bureau of Labor Statistics, CPI for All Urban Consumers, downloaded on May 26, 2022, <https://www.bls.gov/cpi/data.htm>.

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II. INTRODUCTION AND BACKGROUND

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**Q. HOW DOES ONE DETERMINE THE COST OF CAPITAL FOR A
PUBLIC UTILITY?**

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A. To determine the cost of capital, I performed a study consisting of three steps. First, I determined a capital structure appropriate for ratemaking purposes. Utilities normally finance assets with debt, preferred stock and common equity. Because each form of capital has a different cost, especially after income tax considerations, the relative amounts of each form of capital employed to finance the assets can have a significant influence on the overall cost of capital. Second, I determined the cost rates for each form of financial capital. Debt capital contains contractual agreements specifying the annual costs. However, the cost of equity capital is much more difficult to determine, since it requires one to ascertain the state of investors' expectations. Third, by combining the capital structure ratios with the associated cost rates, I calculated an overall weighted cost of capital applicable to the utility.

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**Q. ARE THERE ANY LEGAL AND ECONOMIC GUIDELINES TO
FOLLOW WHEN DETERMINING THE COST OF CAPITAL FOR A
PUBLIC UTILITY?**

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A. A firm's cost of equity capital is equal to the rate of return investors expect to earn on the firm's securities given the securities' level of risk. An investment with a greater risk will require a higher expected

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1 return by investors. In *Federal Power Com. v. Hope Natural Gas Co.*,
2 320 U.S. 591, 603, (1944) (*Hope*), the United States Supreme Court
3 stated:

4 [T]he return to the equity owner should be
5 commensurate with returns on investments in other
6 enterprises having corresponding risks. That return,
7 moreover, should be sufficient to assure confidence in
8 the financial integrity of the enterprise, so as to
9 maintain its credit and to attract capital.

10 In *Bluefield Waterworks & Improvement Co. v. Public Service*
11 *Comm'n*, 262 U.S. 679, 692-93, (1923) (*Bluefield*) the United States
12 Supreme Court stated:

13 A public utility is entitled to such rates as will permit it
14 to earn a return on the value of the property which it
15 employs for the convenience of the public equal to that
16 generally being made at the same time and in the same
17 general part of the country on investments in other
18 business undertakings which are attended by
19 corresponding risks and uncertainties, but it has no
20 constitutional right to profits such as are realized or
21 anticipated in highly profitable enterprises or
22 speculative ventures. The return should be reasonably
23 sufficient to assure confidence in the financial
24 soundness of the utility, and should be adequate, under
25 efficient and economical management, to maintain and
26 support its credit and enable it to raise the money
27 necessary for the proper discharge of its public duties.
28 A rate of return may be reasonable at one time and
29 become too high or too low by changes affecting
30 opportunities for investment, the money market, and
31 business conditions generally.

32 These two decisions recognize that utilities are competing for the
33 capital of investors and provide legal guidelines as to how the
34 allowed rate of return should be set. The decisions specifically speak

1 to the standards or criteria of capital attraction, financial integrity, and
2 comparable earnings. The *Hope* decision, in particular, recognizes
3 that the cost of common equity is commensurate with risk relative to
4 investments in other enterprises. In competitive capital markets, the
5 required return on common equity will be the expected return
6 foregone by not investing in alternative stocks of comparable risk.
7 Thus, in order for the utility to attract capital, possess financial
8 integrity, and exhibit comparable earnings, the return allowed on a
9 utility's common equity should be that return required by investors for
10 stocks with comparable risk. As such, the return requirements of debt
11 and equity investors, which are shaped by expected risk and return,
12 are paramount in attracting capital.

13 It is widely recognized that a public utility should be allowed a rate of
14 return on capital that will allow the utility, under prudent management,
15 to attract capital under the criteria or standards referenced by the
16 *Hope* and *Bluefield* decisions. If the allowed rate of return is set too
17 high, consumers are burdened with excessive costs, current
18 investors receive a windfall, and the utility has an incentive to
19 overinvest. Likewise, customers will be charged prices that are
20 greater than the true economic costs of providing these services.
21 Consumers will consume too few of these services from a point of
22 view of efficient resource allocation. If the return is set too low, then

1 the utility stockholders will suffer because a declining value of the
2 underlying property will be reflected in a declining value of the utility's
3 equity shares. This could happen because the utility would not be
4 earning enough to maintain and expand its facilities to meet
5 customer demand for service, cover its operating costs, and attract
6 capital on reasonable terms. Lenders will shy away from the
7 company because of increased risk that the utility will default on its
8 debt obligations. Because a public utility is capital intensive, the cost
9 of capital is a very large part of its overall revenue requirement and
10 is a crucial issue for a company and its ratepayers.

11 The *Hope* and *Bluefield* standards are embodied in N.C. Gen. Stat.
12 § 62-133(b)(4), which requires that the allowed rate of return be
13 sufficient to enable a utility by sound management

14 to produce a fair return for its shareholders,
15 considering changing economic conditions and other
16 factors . . . to maintain its facilities and services in
17 accordance with the reasonable requirements of its
18 customers in the territory covered by its franchise, and
19 to compete in the market for capital funds on terms that
20 are reasonable and are fair to its customers and to its
21 existing investors.

22 In *State ex rel. Utils. Comm'n v. Cooper*, 366 N.C. 484, 739 S.E.2d
23 541 (2013) (*Cooper*), the North Carolina Supreme Court reversed
24 and remanded the Commission's Order in Docket No. E-7, Sub 989,
25 approving a stipulated return on equity of 10.50% for Duke Energy
26 Carolinas, LLC. In its decision, the North Carolina Supreme Court

1 held that (1) the 10.50% return on equity was not supported by the
2 Commission's own independent findings and analysis as required by
3 *State ex rel. Utils. Comm'n v. Carolina Util. Customers Ass'n*, 348
4 N.C. 452, 500 S.E.2d 693 (1988) (*CUCA I*), in cases involving
5 nonunanimous stipulations, and (2) the Commission must make
6 findings of fact regarding the impact of changing economic
7 conditions on consumers when determining the proper return on
8 equity for a public utility. In *Cooper*, however, the Court held that the
9 Commission must consider changing economic conditions and the
10 impact of those changes when approving a return on equity in all
11 cases that come before it. The foregoing analysis is required without
12 regard to whether a stipulation is present.

13 In considering this element, the Commission is guided by ratemaking
14 principles laid down by statute and interpreted by a body of North
15 Carolina case law developed over many years. According to these
16 principles, the test of a fair rate of return is a return on equity that will
17 provide a utility, by sound management, the opportunity to (1)
18 produce a fair profit for its shareholders in view of current economic
19 conditions, (2) maintain its facilities and service, and (3) compete in
20 the marketplace for capital. *State ex rel. Utils. Comm'n v. General
21 Tel. Co.*, 281 N.C. 318, 370, 189 S.E.2d 705, 738 (1972). Rates
22 should be set as low as reasonably possible consistent with

1 constitutional constraints. *State ex rel. Utils. Comm'n v. Pub. Staff-*
2 *North Carolina Utilities Com.*, 323 N.C. 481, 490, 374 S.E.2d 361,
3 366 (1988). The exercise of subjective judgment is a necessary part
4 of setting an appropriate return on equity. *Id.* Thus, in a particular
5 case, the Commission must strike a balance that (1) avoids setting a
6 return so low that it impairs the utility's ability to attract capital, (2)
7 avoids setting a return any higher than needed to raise capital on
8 reasonable terms, and (3) considers the impact of changing
9 economic conditions on consumers.

10 **Q. WHAT SOURCES OF INFORMATION DID YOU USE IN**
11 **PREPARING YOUR ANALYSIS OF THE COST OF CAPITAL?**

12 A. I have relied on information provided by the Company and information
13 contained in financial reporting services such as: Standard & Poor's
14 Stock Reports, S&P Global Market Intelligence, The Value Line
15 Investment Survey (Value Line), Moody's Credit Reports, and YAHOO
16 Finance.

17 **Q. PLEASE DISCUSS THE OWNERS OF CARDINAL.**

18 A. Cardinal is a limited liability company that is owned by TransCardinal
19 Company, LLC (a wholly owned subsidiary of The Williams Companies,
20 Inc.), and subsidiaries of Piedmont Natural Gas Company, Inc.
21 (Piedmont), and Public Service Company of North Carolina, Inc.
22 (PSNC). The owners supplied the necessary capital to construct

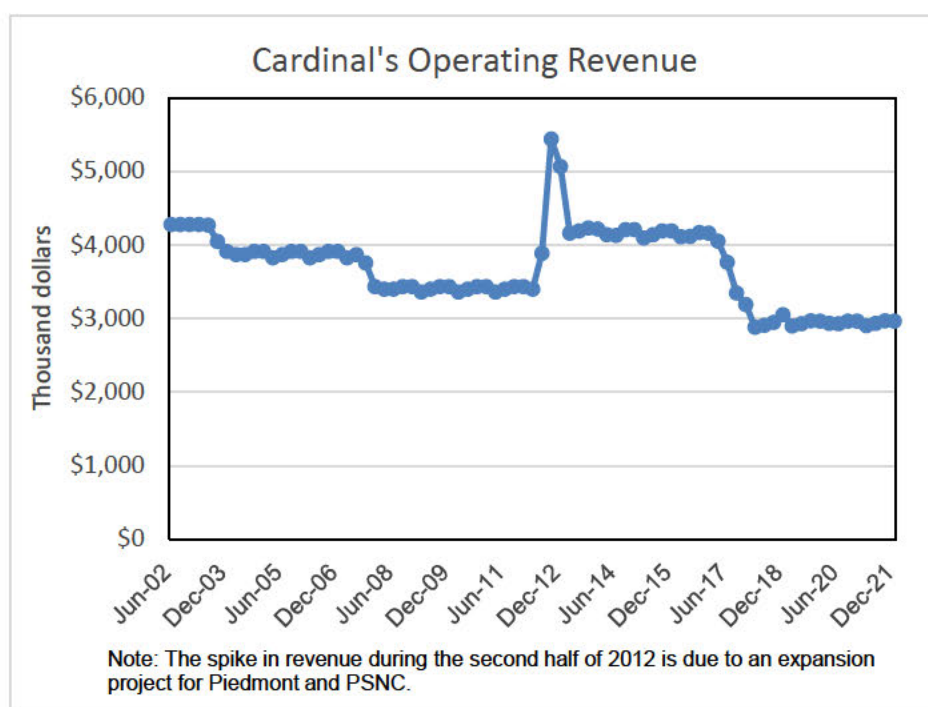
1 Cardinal. Since its initial start-up, the Company has relied on relatively
 2 little external financing from debt or equity investors. In 2011, the
 3 owners infused \$32.7 million and in 2012 the owners infused \$12.8
 4 million. In 2022, the owners contributed \$35 million which helped
 5 enable the retirement of their outstanding \$45,000,000 bond. Shown
 6 below are the annual distributions and capital returns paid to Transco,
 7 Piedmont, and PSNC.

Year	Total Distributions of Income (in dollars)	Return of Capital (in dollars)	Total Payments to Members (in dollars)
2006	9,300,000	0	9,300,000
2007	6,500,000	1,600,000	8,100,000
2008	7,200,000	0	7,200,000
2009	7,084,000	0	7,084,000
2010	6,100,000	0	6,100,000
2011	5,300,000	0	5,300,000
2012	3,000,000	25,000,000	28,000,000
2013	16,000,000	0	16,000,000
2014	10,322,403	2,377,597	12,700,000
2015	7,743,625	3,831,375	11,575,000
2016	7,627,979	3,947,021	11,575,000
2017	6,983,568	7,791,432	14,775,000
2018	0	6,100,000	6,100,000
2019	0	7,000,000	7,000,000
2020	2,884,599	3,615,401	6,500,000
2021	0	0	0
2022	4,400,000		4,400,000

8 **Q. PLEASE DISCUSS THE STABILITY OF CARDINAL'S REVENUES.**

9 A. Cardinal's revenue is based on fixed or demand-related charges as
 10 opposed to a volumetric rate structure, which holding all else constant,
 11 would lower risk. Historically, Cardinal's shipping capacity has been

1 and continues to be 100% nominated by two of its three owners. Unlike
 2 interstate pipelines, Cardinal is not exposed to bypass risk that
 3 interstate pipelines are exposed to in a competitive shipping business
 4 and are forced to offer discounts to reduce its rates to maintain its
 5 shipping throughput nor, has the Company ever had to discount its
 6 rates to acquire additional business from shippers. The below graph
 7 illustrates the stability of its net operating income.



8 **Q. PLEASE DISCUSS THE COMPETITIVE RISKS OF CARDINAL**
 9 **RELATIVE TO INTERSTATE PIPELINES.**

10 A. Based upon my investigation, I see little possibility that Cardinal's
 11 shippers would find it in their best interest to substitute capacity offered
 12 by another pipeline. The fact that the two shippers are also two of the
 13 three owners cannot be overlooked. Company witness David Haag

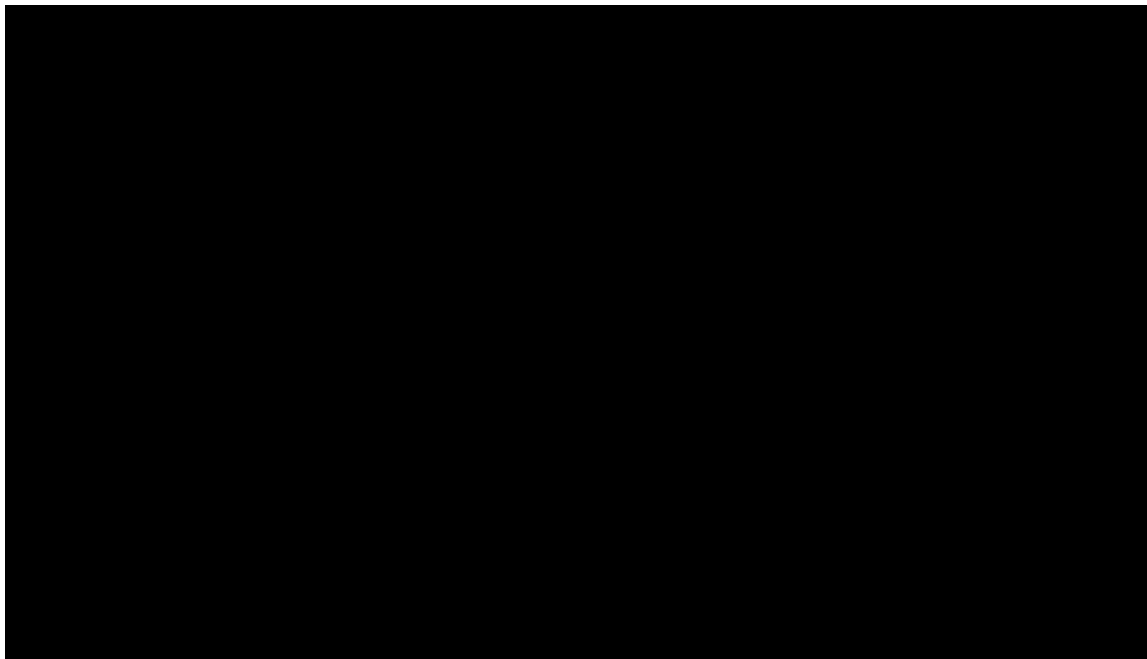
1 notes that the shipping contracts of Cardinal's initial system (Zone 1)
2 operate on a year-year evergreen basis; however, the 2012 expansion
3 project (Zone 2) is under contracts that extend to 2032. Company
4 witness Haag also notes that Cardinal has a higher concentrated
5 shipper base and faces a heightened level of counterparty risk when
6 compared to his proxy group of interstate pipelines. Furthermore,
7 Company witness Haag argues that Cardinal faces competition from
8 other natural gas pipelines, although Transco is largely considered the
9 only interstate pipeline that serves NC. Furthermore, such competition
10 in the interstate pipeline industry is common, and it was acknowledged
11 in a 2020 Williams Company press release² that notes that 51% of the
12 Company's 2019 revenue was based on negotiated rates.

13 It is noteworthy to see that Cardinal Pipeline does not geographically
14 intersect itself with competing pipelines. A current map of the system,
15 that is largely identical to a 2012 map of the system the Public Staff
16 previously obtained in Docket No. G-39, Sub 28, is shown below. The
17 map reveals little changes with other pipelines in Virginia, Tennessee,
18 Georgia, and South Carolina. At that time of the 2012 rate case, the
19 Company's rate of return witness Vilbert noted the risk associated with
20 several natural gas pipelines located within proximity of the markets

² Williams Company Press Release announcing FERC Filing of Transco Rate Case Settlement, January 2, 2020.

1 served by Cardinal. Specifically, he explained that “Columbia Gas
2 Transmission and East Tennessee Natural Gas could expand and/or
3 extend its facilities further into the state to provide additional service to
4 Piedmont and PSNC.”³

5 **BEGIN CONFIDENTIAL**



6 **END CONFIDENTIAL**

7 The relatively static composition of pipelines in and around North
8 Carolina, combined with cancelation of the proposed Atlantic Coast
9 Pipeline, and the questionable future of the proposed Mountain Valley
10 Pipeline indicate that there is little competitive pipeline risk that would
11 prompt Piedmont and PSNC not to renew their capacity contracts with

³ Docket No. G-39, Sub 28, Company response to Item 5 of Public Staff Data Request No. 2, dated September 26, 2012.

1 Cardinal. Therefore, its my opinion that Cardinal does not face the
2 competitive risks of interstate pipeline companies.

3 **Q IF YOU BELIEVE THAT THE INVESTMENT RISK OF CARDINAL IS**
4 **NOT COMPARABLE TO AN INTERSTATE PIPELINE, IS IT**
5 **COMPARABLE TO A LOCAL NATURAL GAS DISTRIBUTION**
6 **COMPANY?**

7 A. Yes, I maintain that the investment risk of Cardinal is more closely
8 aligned with the transmission-related risks of a local distribution
9 company (LDC). The Cardinal pipeline was initially designed as shared
10 transmission plant between PSNC and Piedmont to bring natural gas
11 into the central part of North Carolina where there was substantial
12 economic growth and a growing demand for natural gas. From an
13 engineering perspective, it is my understanding that Cardinal provides
14 highly valuable system strengthening to Piedmont and, especially,
15 PSNC. In that, Cardinal allows PSNC to move capacity from Transco
16 into the Raleigh and Cary areas, and it allows Piedmont to move
17 capacity off of Transco to the Piedmont interconnection near Clayton,
18 NC. In addition, Cardinal allows for the movement of capacity off the
19 Pine Needle LNG facility.

20 Furthermore, it is my understanding that the operating risk associated
21 with Cardinal's transmission lines are not significantly different from the
22 operating risk of the transmission lines of North Carolina's LDCs.

1 Based on data requests obtained in the Piedmont Natural Gas
 2 Company (Piedmont) last rate case in Docket No. G-9, Sub 781, I was
 3 able to conclude that Cardinal's test year O&M expense per mile are
 4 comparable to Piedmont's O&M expense per mile for its transmission
 5 lines. Furthermore, the operating pressures on Cardinal's pipelines are
 6 not significantly different from the pressures along the transmission
 7 lines of PSNC and Piedmont.

8 **III. CAPITAL STRUCTURE AND COST OF DEBT**

9 **Q. WHAT CAPITAL STRUCTURE HAS THE COMPANY REQUESTED**
 10 **THAT THE COMMISSION EMPLOY IN SETTING THE REVENUE**
 11 **REQUIREMENT IN THIS CASE?**

12 A. According to Company witness Kerri Miller's Exhibit KM-002,
 13 Schedule 8, page 2 of 3, the Company has requested the following
 14 capital structure and cost of long-term debt:

15 Cardinal Pipeline Company, LLC
 16 Proposed Capital Structure
 17 as of December 31, 2021

18	<u>Capital Item</u>	<u>Ratios</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
19	Long Term Debt	40.00%	5.25%	2.10%
20	Common Equity	60.00%	11.04%	6.62%
21				
22	Total Capital	100.00%		8.72%

1 **Q. IS THE REQUESTED CAPITAL STRUCTURE APPROPRIATE FOR**
2 **RATEMAKING PURPOSES IN THE PROCEEDING?**

3 A. No. The requested equity ratio is unreasonable and reflects a larger
4 cushion of equity in the capital structure than is warranted given the
5 relatively low financial and business risks of Cardinal. The Company
6 rate of return witness Haag maintains that the business risk of
7 Cardinal is comparable to a group of interstate pipelines that are
8 reasonable in litigated FERC interstate pipeline rate cases. It is
9 understood by most investors that interstate pipelines operate in a
10 highly competitive world for gas shippers. Hinton Exhibit 1 is a
11 Moody's Investor Service (Moody's) report on "Natural Gas Pipelines"
12 that identifies several risk factors, such as the competitive position of
13 a pipeline company, fixed versus floating rate structures with shippers,
14 the likelihood of contract renewal, and length of contract terms with
15 shippers which are largely absent from the risk profile of Cardinal.

16 **Q. WHAT CAPITAL STRUCTURE DO YOU BELIEVE IS**
17 **APPROPRIATE FOR THE COMMISSION TO EMPLOY IN SETTING**
18 **THE REVENUE REQUIREMENT IN THIS CASE?**

19 In view of the lack of any significant competitive risk and Cardinal's
20 relatively low operating risk, I believe it is reasonable for the capital
21 structure to reflect the 51.96% average approved common equity ratio
22 for local natural gas distribution companies observed in 2020, 2021,

1 and the first quarter of 2022, as shown in Hinton Exhibit 2. The average
2 reflects 78 rate cases that range from a maximum equity ratio of
3 60.12% to a minimum equity ratio of 46.26%. In addition, four states⁴
4 were excluded from the sample because the Commission often
5 approves non-capital items, such as cost-free capital and deferred
6 taxes in the structure which reduces the equity ratio and renders the
7 ratio not comparable for this proceeding. In NC and most other states,
8 such non-capital items are used to offset the rate base.

9 **Q. DO YOU SUPPORT THE PROPOSED 5.25% HYPOTHETICAL**
10 **COST OF DEBT?**

11 A. No. Company witness Haag based his 5.25% cost rate for long-term
12 debt on the actual December 31, 2020, interest costs as reported in their
13 SEC filings for his core proxy group of four interstate pipelines: Kinder
14 Morgan, Inc., Pembina Pipeline Corp., TC Energy Corp., and The
15 Williams Companies, Inc. As discussed, I do not agree that the business
16 and investment risks of Cardinal are comparable to an interstate
17 pipeline company. As such, I do not believe this proposed cost of debt
18 is commensurate with the risk of Cardinal.

⁴ The four excluded state jurisdictions are Arkansas, Florida, Indiana, and Michigan.

1 **Q. PLEASE EXPLAIN YOUR CONCERNS WITH THE 5.25% COST**
2 **RATE FOR CARDINAL.**

3 A. I believe the cost rate for debt capital does not reflect the investment
4 risk and, more importantly, the credit quality of Cardinal. Thus, I believe
5 the proposed rate is excessive. This lack of comparability to an
6 interstate pipeline is evident if one reviews the interest rate spread
7 associated with the Company's most recent \$45 million bond issuance.
8 The original issue rate of 3.111% was observed with the \$45 million,
9 five-year debt issuance that was priced on May 17, 2017. For the close
10 on that day, the spread to five-year treasuries was 135 basis points. As
11 such, I recommend a 4.06% cost of debt. This rate is comprised of the
12 135-basis point spread added to the May 27, 2022 treasury yield of
13 2.71% with five-year securities as shown in Hinton Exhibit 3. In my
14 opinion, the 4.06% cost rate is an appropriate cost for Cardinal as
15 opposed to a cost of debt for an interstate pipeline that, on average, has
16 lower bond ratings, increased leverage, and added credit risk. In my
17 opinion, the spread approach better estimates the yield that bond
18 investors would require if Cardinal had decided to refinance this issue
19 as opposed to retiring the bond. In addition, the questionable
20 comparability of the four interstate pipeline is underscored by the
21 notable difference between the pipelines' bond ratings and currently
22 approved embedded cost of debt. The interstate pipelines' cost of debt

1 is higher than both Piedmont's and PSNC's approved debt costs⁵ of
 2 4.08% and 4.48%, respectively. Shown below are the yields and bond
 3 ratings that support Company witness Haag's recommended 5.25%
 4 cost of debt that should be viewed in concert with PSNC's "Baa1" bond
 5 rating by Moody's and Piedmont's bond ratings of "BBB+" and "A3" by
 6 S&P and Moody's, respectively:

Company	Cost Rate As of 12/31/20	S&P Bond Rating	Moody's Bond Rating
Kinder Morgan, Inc.	4.96%	BBB	Baa2
Pembina Pipeline Corp.	4.09%	BBB	NA
TC Energy Corp.	6.38%	BBB+	Baa2
The Williams Co.	5.56%	BBB	Baa2
Average	5.25%		

7 **Q. WHAT IS YOUR RECOMMENDED CAPITAL STRUCTURE AND**
 8 **COST OF DEBT?**

9 A. My recommended capital structure is comprised of 51.96% common
 10 equity and 48.04% long term debt. I also recommend a 4.06% cost rate
 11 for debt as shown below:

⁵ Piedmont's approved cost of debt of 4.08% in Docket No. G-9, Sub 781 and PSNC's approved cost of debt of 4.48% in Docket G-5, Sub 632.

<u>Capital Item</u>	<u>Ratios</u>	<u>Cost Rate</u>
Long Term Debt	48.04%	4.06%
<u>Common Equity</u>	<u>51.96%</u>	
Total Capital	100.00%	

8 **IV. COST OF COMMON EQUITY**

9 **Q. WHAT METHODS DID YOU USE TO DETERMINE THE COST OF**
10 **EQUITY TO CARDINAL?**

11 A. I have employed the discounted cash flow (DCF) model and the risk
12 premium method using a regression analysis of allowed returns for
13 LDCs. In addition, I incorporated the comparable earnings method on
14 my group of LDCs as a check method on the results of my DCF model
15 and Risk Premium method analyses.

16 **A. DCF METHOD**

17 **Q. PLEASE DESCRIBE YOUR DCF ANALYSIS.**

18 A. The DCF model is a method of evaluating the expected cash flows
19 from an investment by giving consideration to the time value of money.
20 The DCF model is based on the theory that the price of the investment
21 will equal the discounted cash flows of returns. The model provides
22 an estimate of the rate of return required to attract common equity
23 financing as a function of the market price of a stock, the company's

1 dividends, and investors' growth expectations. The return to an equity
 2 investor comes in the form of expected future dividends and price
 3 appreciation. However, as the new price will again be the sum of the
 4 discounted cash flows, price appreciation is ignored, and attention is
 5 instead focused on the expected stream of dividends. Mathematically,
 6 this relationship may be expressed as follows:

7 Let D_1 = expected dividends per share over the next twelve months;

8 g = expected growth rate of dividends;

9 k = cost of equity capital; and

10 P = price of stock or present value of the future income stream.

11 Then,

$$12 \quad P = \frac{D_1}{1+k} + \frac{D_1(1+g)}{(1+k)^2} + \frac{D_1(1+g)^2}{(1+k)^3} + \dots + \frac{D_1(1+g)^{t-1}}{(1+k)^t}$$

15 This equation represents the amount an investor would be willing to
 16 pay for a share of common stock with a dividend stream over the
 17 future periods. Using the formula for a sum of an infinite geometric
 18 series, this equation may be reduced to:

$$19 \quad P = \frac{D_1}{k-g}$$

22 Solving for k yields the DCF equation:

$$23 \quad k = \frac{D_1 + g}{P}$$

1 Therefore, the rate of return on equity capital required by investors is
2 the sum of the dividend yield (D_1/P) plus the expected long-term
3 growth rate in dividends (g).

4 **Q. DID YOU CONSIDER THE COST OF EQUITY FOR A GROUP OF**
5 **COMPANIES COMPARABLE IN RISK TO CARDINAL?**

6 A. Yes. The cost of equity capital is a cost borne by firms whose equity
7 shares are considered to be risk-comparable investments. Because of
8 this principle, an analyst can benefit from identifying investments of
9 comparable risk. The use of a group of companies smooths out any
10 abnormally high or low growth rate in earnings or dividends that is not
11 expected to continue indefinitely.

12 In order to estimate the investor-required rate of return, I have identified
13 nine companies inside the natural gas distribution utility companies as
14 identified in the Standard Edition of Value Line. I have removed
15 NiSource, Inc. because they had a cut in their dividends over the last
16 ten years. The investor-related risk measures for this group is shown in
17 Hinton Exhibit 4.

18 **Q. HOW DID YOU DETERMINE THE DIVIDEND YIELD COMPONENT**
19 **OF THE DCF?**

20 A. I calculated the dividend yield by using the Value Line estimate of
21 dividends to be declared over the next 12 months, divided by the
22 price of the stock as reported in the Value Line Summary and Index

1 for each week of the 13-week period from February 25, 2022,
2 through May 20, 2022. A 13-week averaging period tends to smooth
3 out short-term variations in the stock prices. This process resulted in
4 an average dividend yield of 3.2% for the comparable group is shown
5 in Hinton Exhibit 5.

6 **Q. HOW DID YOU DETERMINE THE EXPECTED GROWTH RATE**
7 **COMPONENT OF THE DCF?**

8 A. I employed the growth rates of the comparable group in earnings per
9 share (EPS), dividend per share (DPS), and book value per share
10 (BPS) as reported in Value Line over the past ten and five years. I
11 also employed forecasts of future growth rates as reported in Value
12 Line. The historical and forecasted growth rates are prepared by
13 analysts of an independent advisory service that is widely available
14 to investors and should also provide an estimate of investor
15 expectations. I included both historical, known growth rates and
16 forecast growth rates, because it is reasonable to expect that
17 investors consider both sets of data in deriving their expectations. I
18 should note that, in calculating an average or median growth rate, I
19 did not include negative historical growth rates in EPS, DPS, and
20 BPS. This is because, while negative growth rates are entirely
21 possible, they are generally not the basis for investor expectations
22 with utility investing.

1 Finally, I incorporated the consensus of various analysts' forecasts
2 of five-year EPS growth rate projections as reported in Yahoo
3 Finance. The dividend yields and growth rates for each of the
4 companies and for the average for the comparable group are shown
5 in Hinton Exhibit 5.

6 **Q. WHAT IS YOUR CONCLUSION AS TO THE INVESTOR RETURN**
7 **REQUIREMENT FOR CARDINAL BASED UPON YOUR DCF**
8 **ANALYSIS?**

9 A. Based on the results of my DCF analysis, I conclude that the investor
10 required rate of return for Cardinal is within the range of 9.28% to
11 9.38% with 9.33% as the single-best DCF-based cost of equity
12 estimate. The conclusion of my DCF analysis is shown in Hinton
13 Exhibit 8.

14 **B. RISK PREMIUM METHOD**

15 **Q. PLEASE DESCRIBE THE RISK PREMIUM METHOD BASED ON**
16 **COMMISSION-APPROVED ALLOWED RETURNS OF EQUITY.**

17 A. I used a regression analysis to analyze the historical relationship
18 between allowed returns on common equity and yields on utility
19 bonds. The regression analysis incorporates annual average allowed
20 returns for LDCs as reported by Regulatory Research Associates
21 (RRA) and the annual average single 'A' rated public utility bond
22 yields as reported by the Mergent Bond Record, which is a

1 publication that was previously owned by Moody's shown in Hinton
2 Exhibit 6, page 1 of 2.

3 **Q. WHAT DID YOU CONCLUDE FROM THE ANALYSIS OF**
4 **ALLOWED RETURNS AND UTILITY BOND YIELDS?**

5 A. Using the last six months of 'A' rated public utility bond yields, the
6 regression analysis provides a prediction of the current allowed
7 return of equity and the associated risk premium. Based on those
8 Moody's single "A" rated utility bonds yields and the regression
9 equation, the predicted return on common equity using recently
10 observed interest rates is 9.64% shown in my Exhibit 6, page 2 of 2.

11 **C. COMPARABLE EARNINGS METHOD**

12 **Q. PLEASE DESCRIBE THE CONCEPT BEHIND THE COMPARABLE**
13 **EARNINGS METHOD.**

14 A. The approach is based upon the Hope case cited earlier in my
15 testimony which maintains that an investor should be able to earn a
16 return comparable to the returns available on alternative investments
17 with similar risks. A central premise of the model is that the earned rate
18 of return is a good measure of the true cost of capital meaning that the
19 cost of capital is forward looking, representing the opportunity cost of
20 capital on a risk equivalent basis, as determined in the capital markets.

1 Q. WHAT ARE SOME OF THE STRENGTHS AND WEAKNESSES
2 INHERENT IN THE COMPARABLE EARNINGS APPROACH?

3 A. A strength of this method is that information on earned returns on
4 common equity is widely available to investors, and it is believed that
5 investors use earned returns as a guide in determining an expected
6 return on an investment. A weakness is that actual earned rates of
7 return can be impacted by items outside the company's control such as
8 with weather and inflation. Therefore, an inherent weakness in the
9 model is that the earned return may exceed or fall short of the cost of
10 capital during any given period.

11 Q. PLEASE DESCRIBE YOUR COMPARABLE EARNINGS METHOD.

12 A. I examined the earned returns on common equity as reported in Value
13 Line for the comparable group of local gas distribution for the last five
14 years. Value Line is widely available to investors and the return data is
15 easily gathered from these reports. As such, it is reasonable to assume
16 that such information influences investor expectations shown in Hinton
17 Exhibit 7.

18 Q. WHAT DID YOU CONCLUDE FROM YOUR COMPARABLE
19 EARNINGS ANALYSIS?

20 A. The average and the median earned returns on common equity
21 indicate that the cost of equity lies within the range of 8.80% and

1 9.51%. Thus, I maintain that this method is supportive of my DCF
2 and Risk Premium analyses.

3 **Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY BASED ON**
4 **YOUR OVERALL STUDY?**

5 A. The results of my combined studies indicate a range of estimates
6 from a low of 9.28% to a high of 9.64%. Furthermore, I recommend
7 a 9.48% cost rate for common equity. The 9.48% is based on the
8 averaging of the 9.33% DCF estimate with my 9.64% Risk Premium
9 estimate shown in Hinton Exhibit 8.

10 **Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF**
11 **RETURN ON EQUITY TAKE INTO CONSIDERATION THE IMPACT**
12 **OF CHANGING ECONOMIC CONDITIONS OF THE CUSTOMERS**
13 **OF PIEDMONT AND PSNC?**

14 A. I am not aware of a clear numerical basis for quantifying the impact
15 of changing economic conditions on customers when determining an
16 appropriate return on equity for purposes of setting rates for a public
17 utility. Rather, the impact of changing economic conditions
18 nationwide is inherent in the methods and data used in my study to
19 determine the cost of equity for utilities that are comparable to
20 Cardinal. I have reviewed certain information on the economic
21 conditions in the areas served by Piedmont and PSNC that will be
22 impacted by the return on equity in this proceeding. Specifically, I

1 have reviewed data on the per capita personal income from the
2 Bureau of Economic Analysis (BEA) and unemployment data from
3 the Bureau of Labor Statistics (BLS). The BEA data for the two
4 county service areas indicate that from 2017 to 2020, per capita total
5 personal income grew at an average annual growth rate of 4.3%⁶.
6 County-wide income data from the BEA is not available for 2021;
7 however, per capital income for North Carolina increased 7.9% in
8 2021. In addition, the BLS reports that the state's unemployment rate
9 fell to 3.4%⁷ in April 2022.

10 As discussed previously, the Commission's duty is to set rates as low
11 as reasonably possible consistent with constitutional constraints.
12 This duty exists regardless of the customers' ability to pay. Moreover,
13 the rate of return on common equity is only one component of the
14 rates established by the Commission. General Statute § 62-133 sets
15 out an intricate formula for the Commission to follow in determining
16 a utility's overall revenue requirement. It is the combination of rate
17 base, expenses, capital structure, and cost rates for debt and equity
18 capital, that determines how much customers pay for utility service
19 and investors receive in return for their investment. The Commission

⁶ Bureau of Economic Analysis, Table 1, Personal Income by County and Metropolitan Area, 2020, November 16, 2021.

⁷ Bureau of Labor Statistics, Economy at a Glance, <https://www.bls.gov/eag/eag.nc.htm#>

1 must exercise its best judgment in balancing the interests of both
2 groups. My analysis of the income and unemployment data indicates
3 that economic conditions are not unduly burdensome for the
4 customers of Piedmont's and PSNC's. As shown in the income and
5 unemployment data, overall economic conditions have significantly
6 improved from the height of the pandemic. Nonetheless, I maintain
7 that the recommended rate of return on equity will allow the
8 Company to properly maintain its facilities, provide adequate service,
9 attract capital on terms that are fair and reasonable to its customers
10 and investors, and result in rates that are just and reasonable.

11 **V. REVIEW OF COMPANY WITNESS HAAG'S TESTIMONY**

12 **Q. DO YOU HAVE ANY CONCERNS WITH COMPANY WITNESS**
13 **HAAG'S TESTIMONY?**

14 **A.** Yes. As previously noted, it is my understanding that the capital
15 invested in Cardinal represents an economic solution where PSNC
16 and Piedmont found it to be advantageous to join together and share
17 in the costs to construct and operate the Cardinal pipeline. In that,
18 the pipeline was not created to compete with interstate pipeline;
19 rather, it is an asset largely built to move capacity and storage
20 services off Transco to the Pine Needle facility and to preferred
21 locations within their respective service areas.

1 Thus, I find his proposed cost of common equity, cost rate for long-
2 term debt, and capital structure to be applicable to the cost of equity
3 for Transco and other interstate pipelines; however, I maintain that
4 the investment risk profile of Cardinal is not comparable to an
5 interstate pipeline company. This is indicated by the higher risk
6 measures with Company witness Haag's core group of companies
7 shown in Hinton Exhibit 9 relative to the LDCs shown in Hinton
8 Exhibit 4. While credit ratings are directly linked to the bond investor,
9 I believe that these ratings are also considered by equity investors,
10 especially regulated utility investors. As such, the lower quality bond
11 ratings and higher equity risk ratings with Company witness Haag's
12 core group indicate a higher level of investment risk that is not
13 warranted given the Company's unique ownership structure and
14 operating environment.

1 **VI. SUMMARY AND RECOMMENDATIONS**

2 **Q. WHAT IS YOUR RECOMMENDED OVERALL RATE OF RETURN?**

3 A. The recommended overall cost of capital is comprised of the long-
4 term debt cost rate and the common equity cost rate, weighted
5 according to the recommended capital structure. The result is a
6 weighted overall cost of capital of 6.88%, as shown below and in
7 Hinton Exhibit 10.

8 Cardinal Pipeline Company, LLC
9 Capital Structure
10 as of December 31, 2021

11 Capital Item	12 Ratios	13 Cost Rate	14 Weighted 15 Cost Rate
16 Long Term Debt	48.04%	4.06%	2.03%
17 Common Equity	51.96%	9.48%	4.91%
18 Total Capital	100.00%		6.88%

19 Pre-Tax Interest Coverage 4.3 times

17 **Q. DID YOU PERFORM ANY TESTS OF REASONABLNESS WITH**
18 **YOUR RECOMMENDED RETURN ON EQUITY AND OVERALL**
19 **COST OF CAPITAL?**

20 A. Yes. Based on the recommended capital structure and cost rates,
21 the pre-tax times interest coverage ratio (TIER) is 4.3 times. In my
22 opinion, a pre-tax coverage of this level would qualify as an "A"
23 rating.

- 1 Q. DOES THIS CONCLUDE YOUR TESTIMONY?
- 2 A. Yes, it does.

QUALIFICATIONS AND EXPERIENCE

JOHN ROBERT HINTON

I received a Bachelor of Science degree in Economics from the University of North Carolina at Wilmington in 1980 and a Master of Economics degree from North Carolina State University in 1983.

I joined the Public Staff in May 1985 and have been involved in a variety of projects and testified in numerous dockets. Those projects include (1) developing the long-range forecasts of peak demand and energy sales for electricity in North Carolina in 1986, 1989, and 1992; (2) reviewing numerous peak demand and energy sales forecasts and the resource expansion plans filed in electric utilities' annual IRPs; (3) serving as the lead analyst for the Public Staff in numerous avoided cost proceedings and arbitration proceedings; (4) recommending the appropriate rate of return on equity and debt capital for water, local natural gas distribution and pipeline companies, and electric utilities; (5) performing a financial analysis of two audit reports on Mid-South Water Systems, Inc., filed in Docket No. W-100, Sub 21; (6) serving as a member of the Small Systems Working Group that reported to the National Drinking Water Advisory Council of the U.S. Environmental Protection Agency regarding the 1996 Safe Drinking Water Act; and (7) publishing an article in the National Regulatory Research Institute's Quarterly Bulletin entitled "Evaluating Water Utility Financial Capacity".

I have testified or filed affidavits in the dockets listed below.

<u>ISSUE</u>	<u>DOCKETS</u>
Long-range electric peak demand and energy forecast	E-100, Sub 50
Weather normalization of electricity sales	E-7, Subs 620 and 989 E-2, Sub 833
Customer growth adjustments	E-2, Sub 1023
Level of funding for nuclear decommissioning costs	E-2, Subs 1023 and 1219 E-7, Subs 1026 and 1146
Integrated Resource Plans	E-100, Subs 114 and 125
Avoided Costs for Biennial Proceeding	E-100, Subs 106, 136, 140, 148, and 158
Avoided Costs for energy efficiency and demand side management programs	E-7, Subs 1032 and 1130 E-2, Subs 1145 and 1174
Issuance of Certificates of Public Convenience and Necessity (CPCN) for electric generation	E-2, Sub 669 E-7, Subs 790, 791, and 1134 SP-132, Sub 0
Merger of Dominion Energy, Inc., and SCANA Corp.	E-22, Sub 551 G-5, Sub 585

<p>Fair rate of return</p>	<p>E-22, Subs 333, 412, and 532 G-5, Subs 327, 386, and 632 G-9, Subs 351, 382, 722, and 781 G-21, Subs 293 and 442 P-12, Sub 89 P-26, Sub 93 P-31, Sub 125 P-100, Sub 133b P-100, Sub 133d (1997 and 2002) W-218, Subs 319, 497, and 526 W-354, Subs 360, 364, and 384 W-778, Sub 31 W-1300, Sub 60</p>
<p>Credit metrics and the risk of a downgrade</p>	<p>E-7, Sub 1146</p>
<p>Hedging of natural gas prices</p>	<p>E-2, Subs 1001, 1018, and 1031</p>
<p>Expansion of natural gas</p>	<p>G-5, Subs 337 and 372</p>
<p>Water utility CPCN transfer application</p>	<p>W-1000, Sub 5</p>
<p>Rainfall normalization with respect to water sales</p>	<p>W-274, Sub 160</p>



RATING
 METHODOLOGY

Natural Gas Pipelines

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Summary

This rating methodology sets forth Moody's approach to assessing credit risk for gas pipeline companies whose credit profiles are influenced by their rate regulation and contractual arrangements. This methodology is intended as a reference tool to use when evaluating credit profiles within this sector, helping issuers, investors, and other interested market participants understand how key qualitative and quantitative risk characteristics are likely to affect rating outcomes. This methodology does not include an exhaustive treatment of all factors that are reflected in Moody's ratings but should enable the reader to understand the qualitative considerations and financial information and ratios that are usually most important for ratings in this sector.

This rating methodology supersedes the Rating Methodology for Natural Gas Pipelines published in December 2009. While incorporating many of the core principles of the previous approach, this methodology streamlines and updates how the four key rating factors are defined. No rating changes will result from publication of this rating methodology.

This report includes discussion of the four rating factors and sub-factors included in the rating grid. The purpose of the rating grid is to provide a reference tool that can be used to approximate credit profiles within the pipeline sector. The grid provides summarized guidance for the factors that are generally most important in assigning ratings to these entities. The grid is a summary, and as such, does not include every rating consideration. The weights shown for each factor in the grid represent an approximation of their importance for rating decisions but actual importance may vary significantly. In addition, the illustrative mapping in this document uses historical results while our ratings also consider forward-looking expectations. As a result, the grid-indicated rating is not expected to match the actual rating of each entity, but it will generally produce an indicative rating within two notches of an actual rating.



The grid contains four key factors that are important in our assessment for ratings in the gas pipeline sector. The first three are qualitative factors while the fourth is a quantitative factor:

1. Market Position
2. Quality of Supply Sources
3. Contract Quality
4. Financial Strength

Certain factors also encompass a number of sub-factors or metrics that we explain in detail. Since an issuer's scoring on a particular grid factor sometimes will not match its overall rating, in the Appendix we include a discussion of some "outliers" – gas pipelines whose grid-indicated rating differs significantly from the actual rating.

This rating methodology is not intended to be an exhaustive discussion of all factors that Moody's analysts consider to be pertinent for ratings in the gas pipeline sector. Our ratings incorporate qualitative considerations and factors that do not lend themselves to a transparent presentation in a grid format. The grid represents a decision to avoid greater complexity that would result in grid-indicated ratings that map more closely to actual ratings, in favor of a simpler and more transparent presentation of the factors that are most important for ratings in this sector most of the time.

This report includes the following sections:

- » About the Rated Universe: an overview of the gas pipeline sector;
- » About This Rating Methodology: a description of our rating methodology;
- » Discussion of the Key Rating Factors: a detailed explanation of each of the factors that drive rating quality;
- » Limitations of the Grid and Other Rating Considerations: comments on the rating methodology's limitations, including a discussion of other considerations that are not included in the grid;
- » Appendices: an exhibit of the full grid (Appendix A); a table that lists the grid output for covered issuers with explanatory comments on some of the more significant differences between the grid-implied rating and our actual rating (Appendix B); and a brief sector overview and key credit issues over the intermediate term (Appendix C).

What's Changed

While incorporating many of the core principles of the 2009 version, this methodology updates how the four key rating factors are weighted and defined. These changes reflect a period of adjustment and increased competition as the North American pipeline industry reacts to the shale boom. The factor definitions and weightings also take into consideration that Moody's has been rating a growing number of pipelines outside North America. In terms of the weighting of the four factors, we have decreased Market Position from 20% to 15%, while also decreasing Quality of Supply Sources from 20% to 10%. Market Position is weighted slightly higher than Quality of Supply Sources, because the surge in shale supplies has made availability of supply less of a concern. We raised the weighting for Contract Quality from 20% to 30% as an important indicator of a pipeline's ability to see through this period of adjustment. We increased the weighting for Financial Strength from 40% to 45%, because companies need to be financially stronger to meet more uncertainty in their business environment. The low end of the scale in the methodology grid has been extended from B to Caa to better capture weaker performance.

About the Rated Universe

Gas pipelines are a relatively homogeneous group in terms of business model (single-asset operating company engaged in gas transmission) and regulatory framework (most of the rated pipelines operate under stable and well-established regulatory regimes, such as those in the US and Canada). This methodology includes a few holding companies, but comprises primarily single-asset operating companies. For holding companies, actual ratings may be lower than methodology grid-implied ratings because of the structural subordination of the holding company debt to the operating company debt.

Pipelines covered under this global methodology transport natural gas over long distances, crossing state, provincial, or international borders, and as such, are regulated at the federal level. They can be of national importance. Most of the pipelines operate in stable regulatory frameworks, such as in the US and Canada, that have been liberalized, with a history of operating under private ownership. Unlike the regulated utilities or networks we cover in our other methodologies, the pipelines in this methodology usually do not hold a monopoly franchise and could be subject to some competition. Although regulators oversee the rates pipelines charge, their revenues are determined more by commercial contracts with customers, rather than by revenue requirements set by regulators.

Other Gas-Related Rating Methodologies

The natural gas industry is not a single, homogenous sector, but rather comprises a large collection of companies performing a range of different functions, further differentiated by regulation and ownership. Some entities are vertically integrated to perform the full range of natural gas activities, while others have 'unbundled' to capture only a portion of the gas value chain or otherwise conduct gas-related operations a part of a wider diversified business.

Accordingly Moody's has developed several different methodologies to address the range of natural gas-related businesses and credits, of which *Natural Gas Pipelines* is just one.

Readers are referred to the following additional methodologies pertaining to natural gas-related credits:

[Regulated Electric and Gas Utilities, August 2009 \(118481\)](#)

[Regulated Electric and Gas Networks, August 2009 \(118786\)](#)

[Global Midstream Energy, December 2010 \(128994\)](#)

The rated universe includes 40 entities, of which 32 are domiciled in the US, 5 in Canada, one each in Argentina and Colombia, and one in Kazakhstan. They account for approximately US\$90 billion of total outstanding long-term debt instruments. In general, ratings used in this methodology are the senior unsecured rating for investment grade companies or the Corporate Family Rating for non-investment grade companies.

The critical nature of their services and stable revenues under their contracts lower business risk and enable most of these companies to obtain investment-grade ratings. The ratings in the sector ranges from A2 to B2, with 37 issuers (93% of this universe) currently carrying a stable rating outlook. The average rating is Baa2.

Ratings and debt levels for a subset of 31 of these entities, representing a majority of the universe¹ to which this methodology applies, are shown in the following table.

FIGURE 1
Rated Pipelines

Issuer	Rating	Outlook	Domicile	Total Debt
Alliance Pipeline L.P.	A3 (1)	Stable	US	627
Alliance Pipeline Limited Partnership	Baa1	Stable	Canada	1,215
ANR Pipeline Company	A3	Stable	US	432
Colorado Interstate Gas Company	Baa3	Stable	US	650
El Paso Natural Gas Company	Baa1	Stable	US	1,359
Florida Gas Transmission Company, LLC	Baa2	Stable	US	2,110
Gas Transmission Northwest LLC	A3	Stable	US	325
Gulf South Pipeline Company, LP	Baa1	Stable	US	1,070
Gulfstream Natural Gas System L.L.C.	Baa2	Stable	US	1,149
Iroquois Gas Transmission System, L.P.	A3	Stable	US	375
JSC KazTransGas	Baa3 (2)	Stable	Kazakhstan	661 (5)
Kern River Funding Corporation	A3	Stable	US	675
Maritimes & Northeast Pipeline Ltd Partnsh	A2 (1)	Stable	Canada	375
Maritimes & Northeast Pipeline, LLC	Ba1 (3)	Negative	US	439
Midcontinent Express Pipeline LLC	Ba1 (3)	Stable	US	809
NGPL PipeCo. LLC	Ba3 (3)	Negative	US	3,037
Northern Natural Gas Company	A2	Stable	US	950
Northwest Pipeline GP	Baa1	Stable	US	694
Panhandle Eastern Pipe Line Company, LP	Baa3	Stable	US	1,772
Questar Pipeline Company	A3	Stable	US	459
Rockies Express Pipeline LLC	Ba1 (3)	Stable	US	2,998
Ruby Pipeline, LLC	Baa3	Stable	US	1,399
Southeast Supply Header, LLC	Baa3	Stable	US	375
Southern Natural Gas Company	Baa3	Stable	US	1,210
Southern Star Central Corp.	Ba1	Stable	US	482
Tennessee Gas Pipeline Company	Baa1	Stable	US	2,205
Texas Eastern Transmission L.P.	Baa1	Stable	US	1,165
Texas Gas Transmission, LLC	Baa1	Stable	US	903
Transcontinental Gas Pipe Line Corporation	Baa1	Stable	US	1,354
Transportadora de Gas Internacional S.A. E.S.P	Baa3 (4)	Stable	Colombia	1,120
Transportadora de Gas del Sur S.A.	B3 (4)	Negative	Argentina	378

Total Debt (US\$ MM) as of 6/30/12.

- (1) Senior secured rating. In project finance, typically the fundamental rating reflecting the benefits of security and other enhancements.
- (2) LT Issuer Rating (Foreign Currency).
- (3) Corporate Family Rating.
- (4) Senior Unsecured (Foreign Currency).
- (5) As of 12/31/11.

¹ This subset excludes holding companies that make up a part of this universe.

About This Rating Methodology

Moody's approach to rating gas pipelines, as outlined in this methodology, incorporates the following steps.

1. Identification of the Key Rating Factors

The grid in this rating methodology focuses on four broad rating factors. Certain broad factors are comprised of sub-factors that provide further detail.

FIGURE 2

Natural Gas Pipelines

Broad Rating Factors	Factor Weighting	Rating Sub-Factor	Sub-factor Weighting
Factor 1: Market Position	15%	Demand Growth	5%
		Competition	5%
		Volume Risk & Throughput Trend	5%
Factor 2: Quality of Supply Sources	10%		10%
Factor 3: Contract Quality	30%	Firm Revenues	10%
		Contract Life	10%
		Shipper Quality / Recontracting Risk	10%
Factor 4: Financial Strength	45%	FFO / Int (1 yr)	15%
		FFO / Debt (1 yr)	15%
		RCF/ Debt (1 yr)	15%
Total	100%	Total	100%

2. Measurement or Estimation of the Key Rating Factors

We explain below how we generally calculate or estimate the sub-factors for each grid factor and also weigh each of these individual sub-factors. We also provide a rationale for using each sub-factor. The information used in assessing the sub-factors is generally found in or calculated from information in financial statements, derived from other observations, or estimated by Moody's analysts.

Moody's ratings are forward-looking and incorporate our expectations for future financial and operating performance. We use both historical and projected financial results in the rating process. Historical results help us understand patterns and trends for a company's performance as well as for peer comparison. We use historical data (in most cases, the last 12 months of reported results) in this document to illustrate the application of the rating grid. All of the quantitative credit metrics incorporate Moody's standard adjustments to the financial statements.

3. Mapping Factors to the Rating Categories

After estimating or calculating each sub-factor, we map the outcomes for each of the sub-factors to a broad Moody's rating category (Aaa, Aa, A, Baa, Ba, B, or Caa).

4. Determining the Overall Grid-Indicated Rating

To determine the overall grid-indicated rating, we convert each of the sub-factor ratings into a numeric value based upon the scale below.

FIGURE 3

Grid Indicated Rating

Aaa	Aa	A	Baa	Ba	B	Caa
1	3	6	9	12	15	18

The numerical score for each sub-factor is multiplied by the weight for that sub-factor with the results then summed to produce a composite weighted-factor score. The composite weighted factor score is then mapped back to an alphanumeric rating based on the ranges in the table below. For example, an issuer with a composite weighted factor score of 8.2 would have a Baa1 grid-indicated rating.

Grid Indicated Rating	Aggregate Weighted Total Factor Score
Aaa	$x < 1.5$
Aa1	$1.5 \leq x < 2.5$
Aa2	$2.5 \leq x < 3.5$
Aa3	$3.5 \leq x < 4.5$
A1	$4.5 \leq x < 5.5$
A2	$5.5 \leq x < 6.5$
A3	$6.5 \leq x < 7.5$
Baa1	$7.5 \leq x < 8.5$
Baa2	$8.5 \leq x < 9.5$
Baa3	$9.5 \leq x < 10.5$
Ba1	$10.5 \leq x < 11.5$
Ba2	$11.5 \leq x < 12.5$
Ba3	$12.5 \leq x < 13.5$
B1	$13.5 \leq x < 14.5$
B2	$14.5 \leq x < 15.5$
B3	$15.5 \leq x < 16.5$
Caa	$x \geq 16.5$

5. Limitations of the Grid and Other Rating Considerations

This section discusses limitations in the use of the grid to map against actual ratings and additional factors that are not included in the grid that can be important in determining ratings.

Discussion of the Key Rating Factors

Moody's analysis of gas pipelines focuses on four broad factors:

1. Market Position
2. Quality of Supply Sources
3. Contract Quality
4. Financial Strength

Factor 1: Market Position

Why It Matters

Market Position gauges the level of diversity in a pipeline's demand markets and the potential for internal growth. A strong economy and population growth increase demand for natural gas and for additional pipeline infrastructure, which would generate incremental revenues. Customers in such markets are more likely to renew their contracts. Access to a number of substantial markets reduces a pipeline's vulnerability to a downturn in the economy in a particular region as well as sensitivity to the basis differential between any two points, improving the value of a pipeline's capacity.

Market Position is important because unlike regulated electric and gas utilities and networks, pipelines can be exposed to a measure of competition with other pipelines. They typically do not hold a regulated monopoly position or a license to serve a particular franchise, and may exist in a region served by one or more other pipelines.

The level of competition could rise, such as in North America, where gas flow patterns and throughput are shifting due to new supply basins and pipeline expansions. In this regard, pipelines with a large, diverse system with access to multiple alternative markets have more flexibility to navigate the competitive landscape. Additionally, owning storage facilities and providing premium ancillary services could help a pipeline maintain its market position.

How We Measure Demand Growth For the Grid

We measure Demand Growth by the scale, diversity, and the economic health of the end-markets served. A strong economy coupled with population growth create the need for more natural gas and pipeline infrastructure. In addition, government policies and existing gas delivery infrastructure could enable or hinder gas consumption. The population in the end-market is one proxy of Demand Growth. For example, New York City, with 19 million people, scores an A, while Chicago, a more mature gas market with almost 10 million people, maps to Baa².

How We Measure Competition For the Grid

Pipelines face varying degrees of competition in the markets to which they deliver. A pure monopoly could conceivably score a Aaa, but a government-owned monopoly pipeline could be ranked as Aa or lower depending on whether it faces competition in serving international gas markets. Nevertheless, the high costs and logistical infeasibility of connecting to an alternative pipeline make many customers and markets captive to certain pipelines. For example, the oligopoly of four pipelines that access New York City scores as an A. Markets where more competition among multiple pipelines has long existed, such as on the Gulf Coast, would result in a Baa. A pipeline could score Ba or lower if it is losing market share, and consequently margins, to new or existing pipelines.

How We Measure Volume Risk & Throughput Trend for the Grid

The Volume Risk & Throughput Trend sub-factor is measured in terms of variability in annual throughput volumes. Sustaining exceptional throughput growth that would merit a Aaa would be unusual, since pipelines have a finite capacity, and would entail an extraordinary type of expansion. Most pipelines in the peer group are mature or run near capacity, seeing little change from year to year, and score as a Baa. A few that are expanding may score an A. Pipelines with wide swings in annual throughput would rate a Ba, and those facing declining throughput would score as a B or Caa.

² *Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2010 to July 1, 2011*, [US Census Bureau](#), October 27, 2012

FACTOR 1

Natural Gas Pipelines

Factor 1	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Market Position (15%)	a) Demand Growth	5%	Exceptionally large, diverse, developed economic base and end-market, e.g., population >25,000,000	Exceptionally large, diverse, developed economic base and end-market, e.g., population >20,000,000	Very large, diverse, developed economic base and end-market, e.g., with population >15,000,000	Large, diverse economic base and end-market that is either developed/ mature or developing/growing, e.g., population >5,000,000	Medium-sized economic base and end-market that is either developed/ mature or undeveloped/growing, e.g., population >1,000,000	Small economic base and end-market that is either developed/ declining or undeveloped/growing, e.g., population >500,000	Very small economic base and end-market that is declining or undeveloped, e.g., population <500,000
	b) Competition	5%	No competition; no change in foreseeable future.	Very limited competition; no change in foreseeable future.	Well-established and stable competitive environment; little change in foreseeable future.	Stable competitive environment, but competition may intensify over the long term with gradual impact.	Competitive environment; may intensify over the medium term with gradual impact.	Changing competitive environment; likely to decrease margins over the medium term.	Rapidly changing competitive environment; likely to decrease margins over the short term.
	c) Volume Risk & Throughput Trend	5%	Nil long term volume risk; exceptionally strong commercial outlook, e.g., sustainable 50% increase in throughput over 3 yrs.	Modest long term volume risk; strong commercial outlook, e.g. sustainable 30% to 50% increase in throughput over 3 yrs.	Modest medium term volume risk; good commercial outlook, e.g. sustainable 10% to 30% increase in throughput over 3 yrs.	Limited medium term volume risk; good commercial outlook; pipe full or moderately increasing throughput, e.g. 0% to 10% over 3 yrs.	Material medium term volume risk; steadily decreasing throughput, e.g. 0% to -25% over 3 yrs.	Significant near term volume risk; rapidly decreasing or uncertain throughput, e.g. -25% to -50% over 3 yrs.	Extraordinarily decreasing or uncertain throughput, e.g. -50% or more over 3 yrs.

Factor 2: Quality of Supply Sources

Why It Matters

Access to large, diverse, and growing gas supplies is important in reducing a pipeline's vulnerability to a downturn in drilling activity in a particular region or by a particular producer, to supply disruptions caused by extreme weather, and to the natural declines in gas reserves over time.

Because gas is a depleting resource, pipelines must have continual access to new supply as a means to offset natural declines in volume and to sustain demand for their services. In the supply area, substantial and growing production thus enhances the value of a pipeline's capacity. Ownership of numerous interconnects with other pipelines provides more supply (as well as market) options for shippers and raises the value of a pipeline's capacity. Attractive supply markets imply organic expansion opportunities and, by extension, revenue growth to mitigate rising costs.

With the surge in shale gas and oil development, especially over the last several years, assessments of future production growth and the potential size of those developments are more dynamic than before. Hydraulic fracturing and horizontal drilling techniques are being improved and successfully applied to a growing legion of unconventional resource plays. These new supply areas have relatively short operating histories, which makes it more difficult to gauge their long-term growth potential with any great certainty. In addition, improved technologies are accelerating shifts in drilling activity from one area to another, further casting uncertainty as to the trajectory in future production volumes.

How We Measure Quality of Supply Sources for the Grid

The criteria we consider include the size and diversity of a pipeline's sources of supply and production volume trends. An indicator of Quality of Supply Sources is annual production volume in a supply region in terms of billion cubic feet per annum (BCF p.a.). Areas of substantial production that have superior access to markets are viewed more favorably as supporting future throughput on the pipeline and the value of its capacity.

We score most pipelines in our 31-pipe sample to be Baa quality, with access to multiple well-established supply regions. Within the Baa category, however, pipelines serving the Rockies, an area distant from the consuming markets and having a limited infrastructure for gas export, are less well positioned than pipelines in the Gulf Coast, an area that produces a similar amount of gas, but which is closer to the market and has an extensive pipeline network. The Marcellus Shale currently produces less gas than do the Rockies or the Gulf Coast, but pipelines there score an A, because of the area's superior prospects for production growth and access to nearby markets. Pipelines that have fewer or smaller than average supply sources would be a Ba. Those that rely on a supply source nearing the end of its economic life may be rated B or lower, depending on the pace of the decline and availability of replacement resources.

FACTOR 2

Natural Gas Pipelines

Factor 2	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Quality of Supply Source (10%)	Supply Source	10%	Numerous supply areas with exceptionally high production e.g., >20,000 BCF p.a.	Numerous supply areas with very high production, e.g., >10,000BCF p.a.	Several supply areas with very high production, e.g., >5,000 BCF p.a. (or >1,000 BCF p.a. with very strong growth outlook); excellent access to markets	Some diversity in supply areas with substantial production, e.g., >1,000 BCF p.a. (or >500 BCF p.a. with very strong growth outlook); reasonable access to markets	Concentration in supply areas with moderate production, e.g., >500 BCF p.a. (or >250 BCF p.a. with strong growth outlook); some limitation in access to markets	Reliance on supply area with low/declining production, e.g., >250BCF p.a.	Reliance on supply area with very low/fast declining production, e.g., <250BCF p.a.

Factor 3: Contract Quality

Why It Matters

Although regulators may set tariffs that pipelines can charge, it is up to the pipeline to secure contracts with customers in order to generate revenue. Contract Quality thus is a reflection of how customers value a pipeline's services, and consequently, carries the highest weighting among the three qualitative factors in the grid.

The quality of a pipeline's contract portfolio will be all the more important rating consideration over the next few years in North America, as new shale supplies alter demand for gas transport services. A company with a longer contract life will be better able to see through this period of adjustment for the North American gas pipeline grid.

It is not unusual for a few shippers to account for a majority of a gas pipeline's revenues. Concentration risk can be mitigated, however, if those shippers are investment-grade utilities that are physically connected to the pipeline, thus effectively captive to it and more likely to renew. Pipelines of recent vintage have tended to be built for E&P companies that for the most part have had lower credit quality and a less certain long-term commitment to a pipeline than traditional utility shippers have had. Marketers typically have a short-term orientation and are less likely to commit long term under firm contracts.

Unless they benefit from some form of monopoly, pipelines could be subject to competition, so in order to maintain their market share and renew contracts at reasonable rates, they must innovate and provide reliable, cost-competitive services to suit their customers' needs. Contract renewal risk exists; however, pipelines in Moody's universe have successful records in getting their contracts renewed.

How We Measure Firm Revenues For the Grid

We measure the Firm Services sub-factor through the percentage of total revenues or capacity that is contracted for firm gas transportation and storage services. A positive indicator is a high proportion of revenues from firm services, rather than interruptible and other services that are paid only when used, therefore less predictable and more market-driven. In the US and Canada, firm revenues are stable, because fees are mostly fixed, plus a small variable component tied to volumes shipped. Most pipelines in our 31-pipe sample have revenues that are over 90% from firm services, and score as Aa under this sub-factor.

How We Measure Contract Life for the Grid

Contract Life is the weighted average number of years remaining on a pipeline's contracts. The average for Moody's peer group is 7 years, which maps to a low A.

How We Measure Shipper Quality / Re-contracting Risk for the Grid

For this publication, we used the weighted average rating of the top ten shippers as a proxy for Shipper Quality. These top shippers usually accounted for the majority of the revenues. The rest of the shippers were numerous and individually comprised immaterial portions of revenues, so that the pipeline would be almost indifferent to a contract disruption among these smaller shippers.

We estimate Re-contracting Risk by assessing how reliant major customers are to the pipeline, whether any viable alternative pipeline exists, and what the customers' long-term strategic interest is in holding that capacity. Most pipelines in Moody's pipeline sample score as A to Baa on Shipper Quality/Re-contracting Risk, reflecting the ratings of their core utility customers.

FACTOR 3

Natural Gas Pipelines

Factor 3	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Contract Quality (30%)	a) Firm Revenues	10%	Firm agreements comprise 100% of revenues or capacity.	Firm agreements comprise 90 < 100% of revenues or capacity.	Firm agreements comprise 80 < 90% of revenues or capacity.	Firm agreements comprise 70 < 80% of revenues or capacity.	Firm agreements comprise 60 < 70% of revenues or capacity.	Firm agreements comprise 50 < 60% of revenues or capacity.	Firm agreements comprise < 50% of revenues or capacity.
	b) Contract Life	10%	Average remaining life of contract of > 30 yrs.	Average remaining life of contract of 15 to 30 yrs.	Average remaining life of contract of 7 to 15 yrs.	Average remaining life of contract of 5 to 7 yrs.	Average remaining life of contract of 3 to 5 yrs.	Average remaining life of contract of 2 to 3 yrs.	Average remaining life of contract of < 2 yrs.
	c) Shipper Quality / Re-contracting Risk	10%	Well-diversified portfolio of longstanding shippers with a weighted average rating of Aaa; certain to renew contracts	Well-diversified portfolio of longstanding shippers with a weighted average rating of Aa; highly likely to renew contracts	Reasonably diverse portfolio of longstanding shippers with a weighted average rating of A; likely to renew contracts	Concentrations in some shippers with a weighted average rating of Baa; a few may not renew contracts	Shippers with a weighted average rating of Ba; several may not renew contracts	Shippers with a weighted average rating of B; some will not renew contracts	Shippers with a weighted average rating of Caa; many will not renew contracts

Factor 4: Financial Strength

Why It Matters

Natural gas transmission is a regulated, asset-based business. Financial strength is necessary for a pipeline to attract capital at a reasonable cost to maintain competitive cost-of-service rates and to reinvest in the business. Older pipelines will need to make refurbishments to ensure their safety and to meet environmental requirements.

As single-asset businesses, the pipelines' financial statements tend to be straightforward; their capital structures, simple. Because they do not engage in the gas supply function, changes in working capital and regulatory assets and liabilities are less significant than they are typically for regulated utilities.

Once constructed, a pipeline needs little maintenance capital, so that they tend to generate excess cash flow absent any expansion projects. Generally, pipelines retain earnings to manage their capital structure within their targeted range and upstream free cash flow in the form of dividends and inter-company advances to their parent companies.

Most pipelines are privately-owned subsidiaries, so that their dividends can be irregular if, for example, they are self-financing a capital project. Increasingly in the US, however, pipelines are owned by publicly traded master limited partnerships (MLPs), which promise high payouts to their equity holders. Consequently, a pipeline's dividends may become more of a set cash requirement under MLP ownership. This methodology update adds the retained cash flow (funds flow from operations minus dividends) to debt ratio to capture a pipeline's financial flexibility and its owner's financial strategy.

Because the North American pipeline industry is in a period of flux, the current last 12 months' financial results are a better measure of performance now than before when 3-year historical averages were sufficient to cover an industry in steady-state. We will factor into our ratings changes in circumstances that could have a material effect on a pipeline's future results, for example, a rate case, an addition or a loss of a significant contract, an expansion project, a new financing, or new ownership.

How We Measure Financial Strength for the Grid

The funds flow from operations (FFO) interest coverage ratio is calculated by dividing annual FFO (net income plus non-cash items such as depreciation and deferred taxes excluding working capital changes) plus interest expense by interest expense.

The FFO to debt ratio is calculated by dividing annual FFO by total debt.

Retained cash flow to debt ratio is calculated by dividing annual FFO less dividends by total debt.

FACTOR 4

Natural Gas Pipelines

Factor 4	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Financial Strength (45%)	a) FFO + Interest / Interest (1 yr)	15%	> 7x	6 - 7x	5 - 6x	4 - 5x	3 - 4x	2 - 3x	< 2x
	b) FFO / Debt (1 yr)	15%	> 60%	40 - 60%	25 - 40%	15 - 25%	10 - 15%	5 - 10%	< 5%
	c) FFO - Dividends / Debt (1 yr)	15%	> 35%	25 - 35%	18 - 25%	12 - 18%	6 - 12%	0 - 6%	< 0%

Limitations of the Grid and Other Rating Considerations

The rating methodology grid represents a decision to favor simplicity that enhances transparency and to avoid greater complexity that would enable the grid to map more closely to actual ratings. Accordingly, the four rating factors in the grid do not constitute an exhaustive treatment of all the considerations that are important for ratings of entities in the gas pipeline sector. In addition, our ratings incorporate expectations for future performance, while the financial information that is used to illustrate the mapping in the grid is mainly historical. In some cases, our expectations for future performance may be informed by confidential information that we cannot publish or otherwise disclose. In other cases, we estimate future results based upon past performance, industry trends or other factors. In either case, predicting the future is subject to the risk of substantial inaccuracy.

Assumptions that may cause our forward-looking expectations to be incorrect include unanticipated changes in any of the following factors: the macroeconomic environment and general financial market conditions, sector trends, new technology, regulatory and legal actions, as well as management's appetite for additional debt to finance capital expenditures.

In choosing metrics for this rating methodology grid, we did not explicitly include certain important factors that are common to all gas pipelines, such as the quality and experience of management, assessments of governance and the quality of financial reporting and information disclosure. The assessment of these factors can be highly subjective and vary over time. Therefore, ranking these factors by rating category in a grid would suggest too much precision in the relative ranking of particular issuers against all other issuers that are rated in various industry sectors. We note, however, these excluded factors do affect those that are included in the grid (such as management experience affecting the revenue performance of a pipeline over time).

Ratings may include additional factors that are difficult to quantify or that have a meaningful effect in differentiating credit quality only in some cases, but not all. Such factors include substantial leverage at the pipeline's parent company or ownership by an MLP. Changes in regulation, affecting tariffs, safety and environmental requirements as well as changes to drilling technology and areas of natural gas production, changing gas flow patterns on competing pipelines, and macroeconomic trends also affect ratings. While these are important considerations, it is not possible to precisely express these in the rating methodology grid without making the grid excessively complex and significantly less transparent. Ratings may also reflect circumstances in which the weighting of a particular factor will be substantially different from the weighting suggested by the grid.

Other Rating Considerations

Moody's considers other factors in addition to those discussed in this report, but in most cases understanding the framework presented herein will enable a good approximation of our view on the credit quality of issuers in the gas pipeline sector. Moody's considers additional factors, including future operating and financial performance, that may deviate from historic performance, the quality of management, governance, financial controls, event risk, and seasonality. The analysis of these factors remains an integral part of our rating process.

Management Quality

The quality of management is an important factor supporting the credit strength of a gas pipeline. We normally meet with the pipeline owner's senior executives to assess management's business strategies, policies, and philosophies, and evaluates management performance relative to performance of competitors and our projections as well as changes in technology and patterns of usage.

An established managerial record provides us with insight into management's likely future performance in stressed situations. This can be an indicator of management's tendency to stray significantly from what may be an effective current business philosophy, or conversely, to adopt changes where they are warranted by new sets of circumstances.

Financial Controls

We rely on the accuracy of audited financial statements to assign and monitor ratings. Such accuracy is only possible when companies have sufficient internal controls, including centralized operations, and consistency in accounting policies and procedures.

Weaknesses in the overall financial reporting processes, financial report restatements or delays in producing audited financial statements can be indications of a potential breakdown in internal controls.

Liquidity Management

Liquidity is usually not a concern for pipelines, which are stable generators of free cash flow, requiring little working capital and capital investment. Pipelines therefore often do not have their own bank lines, which would provide an alternative source of liquidity. Instead, they keep cash on hand and rely on money pool arrangements with their parent companies. Liquidity will be particularly important if the pipeline is undergoing a large, extended capital project, or if the parent company (now oftentimes an MLP) has capital requirements of its own that make cash upstreamed from the pipeline, in form of both dividends and advances, a more fixed cash requirement.

Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an issuer's fundamental creditworthiness. Typical special events include a change in ownership and in the credit quality of that owner, a recapitalization, or an unexpected change in tariffs or terms of a material contract.

Notching Considerations

While the factors and sub-factors within the grid are designed to include the key rating drivers reflecting the fundamental risks of gas pipelines, the grid alone cannot capture some of the wide-ranging factors that may impact the credit rating.

The notching factors are designed to adjust, either upwards or downwards, a pipeline's indicated rating based on other considerations not adequately addressed in the rating grid. Moody's analysts may or may not assign a notch upwards or downwards to a rating as this is a case-by-case assessment determined by a rating committee. Unless specifically provided for in this methodology, the extent of notching by a rating committee may exceed more than one notch since these considerations can potentially encompass a wide deviation from the assumptions incorporated in this methodology.

Project Finance: Rating Uplift from Structural Enhancements

Project finance may be a viable option for financing pipelines being developed currently or in the future. We believe that in the infrastructure sector in general, structural enhancements provided to financial creditors may provide valuable protection and be a source of rating uplift when compared to those issuers that do not grant such protections. These factors were recognized and articulated within a debt rating framework in Moody's rating methodologies for regulated electric and gas networks, operational toll roads and operational airports outside the US. We have employed the same factors in the same way within this rating methodology. The defined sources of ratings uplift, their potential characteristics and their measurement are identical in these methodologies and are as set out below.

We have classified the sources of rating uplift from creditor protection into three categories:

- a) Event Risk Protection
- b) Debt Structure and Liquidity Protection
- c) Control Afforded to Creditors

In each of these categories, we look at specific concessions made to creditors and score their effectiveness on a scale of five grades: “none”; “low”; “medium”; “high”; and “very high”. Each grade is worth a fraction of or a whole rating notch (“none” = 0%; “low” = 25%; “medium” = 50%; “high” = 75%; and “very high” = 100%). In terms of the grid framework output, the sum of the scores of these categories is then rounded to produce 0 to 2 rating notches of uplift.

These categories of protection are fairly standard in project financings. Scoring the effectiveness of each of these protections for specific pipelines will be judged relative to comparable project financings. The effectiveness of these enhancements could also be re-calibrated over time, for example, giving more uplift during construction when the risks are higher, but less when the pipeline has established operations and is less distinguishable from corporate finance pipelines.

Debt structural features will be assessed in the context of the legal jurisdiction relevant to the issuer, as the value of certain contractual arrangements (e.g., security) may vary from jurisdiction to jurisdiction.

a) Event Risk Protection

In this category, we typically review restrictive covenants including:

- i. Restrictions on permitted business outside the core regulated business
- ii. Restrictions on acquisitions/disposals
- iii. Restrictions on investments
- iv. Restrictions on additional indebtedness

Project and other structured financings typically incorporate ring-fencing provisions designed to insulate the credit quality of the pipeline from that of its wider corporate family or shareholders. These provisions may be crucial in order for the rating of the pipeline to reflect exclusively its credit quality, assessed as described in this rating methodology. However, they do not enhance the pipeline’s stand-alone credit quality (serving only to protect it) and therefore are not listed as a source of rating uplift.

b) Debt Structure and Liquidity Protection

Structural enhancements in this category address financial risks associated with liquidity, interest rate and refinancing risk. Typical arrangements include:

- i. Dedicated cash reserves to cover specific costs, for example liquidity facility covering scheduled interest payments, often for the next 6 months
- ii. No material refinancing risk (e.g., benefits of amortizing debt)

The different arrangements above may have different levels of bearing on our assessment of the effectiveness of creditor protection in this category, depending on the specific circumstances of the issuer. A fully amortizing debt structure, typical of project financings and typically associated with adequate reserving arrangements, is generally regarded as necessary to achieve a score of “very high” in this category.

c) Control Afforded to Creditors

Among the most typical structural features, financial covenants and security arrangements are included in this category, as they provide creditors with a degree of control over the company's financial and business decisions in downturns, which are not enjoyed under typical corporate funding arrangements. Specific structural features that we classify in this category include:

- i. Remedies to delay insolvency (e.g., security and intercreditor agreements, etc).
- ii. Restrictions on payments and distribution lock-ups (e.g., if metrics deteriorate below minimum required parameters).
- iii. Frequent and regular reports of creditors' technical advisers to sanction base case validity and compliance with contractual and financial obligations.

As for the previous category (Debt Structure and Liquidity Protection), the whole package of structural enhancements is assessed to gauge the overall effectiveness. For example, independent validation of compliance with financial ratio covenants may be an important consideration in assessing the effectiveness of such covenants. Creditor step-in rights should be specifically permitted under the legal framework as well as the finance documents.

We give value to security arrangements – typically in respect of the shares in a pipeline entity and project documents – as one albeit critical element of a wider package of concessions designed to improve creditors' ability to detect early potential problems and rectify them if possible (in the first instance by retaining cash surpluses within the company), or, if remedial action is not possible or fails, to maximize recovery prospects. As normally security is not allowed or is not enforceable on the regulated assets, a rating uplift is not generally achievable simply by granting security.

In conclusion, structural enhancements can deliver up to two notches of uplift from a fundamental rating if they are very comprehensive and effective. Sources of creditor protection can be regarded as very restrictive by management and shareholders as they can significantly constrain management's ability to pursue strategies and policies that they may perceive will enhance shareholder value, even though they may potentially result in higher risks for the company. Consequently, in many cases, protective arrangements granted to creditors are not as fully comprehensive as those required to obtain the maximum possible uplift.

Conclusion: Summary of the Grid-Indicated Rating Outcomes

North America

The grid-indicated ratings included in this publication are based on historical financial data to illustrate the application of the grid. The grid-indicated ratings for the 31 representative gas pipelines map to current assigned ratings as follows (see Appendix B for details):

12 pipelines map to their actual rating;

10 pipelines have a grid-indicated rating that is one alpha-numeric notch from its actual rating;

7 pipelines have a grid-indicated rating that is two alpha-numeric notches from its actual rating.

2 pipeline has a grid-indicated rating that is three alpha-numeric notches from its actual rating.

Outside North America

This methodology applies to three gas pipelines outside North America. The grid-indicated rating mapped to one notch below the Baa3 foreign currency senior unsecured rating of Colombian Transportadora de Gas Internacional S.A. E.S.P. The grid-indicated rating was three notches above the B3 foreign currency senior unsecured rating for Transportadora de Gas del Sur (TGS) and the Baa3 foreign currency issuer rating for JSC KazTransGas (JKT).

The methodology grid is calibrated based on a credit-neutral sovereign environment as is typical where the government is rated Aaa. Where country risks become more material it may be necessary to adjust the scorecard outcome accordingly.

In the case of TGS, the B3 foreign currency rating reflects the credit quality of the Argentine government (B3), which has frozen the pipeline's tariffs, while the grid-indicated rating is lifted by the strong cash flows from its unregulated natural gas liquids business.

For JKT, where a government-owned gas pipeline might be expected to receive extraordinary government support, we use this methodology to calibrate its Baseline Credit Assessment and then apply our methodology for Government-Related Issuers to give a further uplift for expected extraordinary governmental support. In the case of JKT, its Baa3 foreign currency issuer rating reflects indirect ownership and "high support" by the Government of Kazakhstan (Baa2 stable).

Appendix A: Natural Gas Pipeline Methodology Grid

FACTOR 1									
Natural Gas Pipelines									
Factor 1	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Market Position (15%)	a) Demand Growth	5%	Exceptionally large, diverse, developed economic base and end-market, e.g., population >25,000,000	Exceptionally large, diverse, developed economic base and end-market, e.g., population >20,000,000	Very large, diverse, developed economic base and end-market, e.g., with population >15,000,000	Large, diverse economic base and end-market that is either developed/mature or developing/growing, e.g., population >5,000,000	Medium-sized economic base and end-market that is either developed/mature or undeveloped/growing, e.g., population >1,000,000	Small economic base and end-market that is either developed/declining or undeveloped/growing, e.g., population >500,000	Very small economic base and end-market that is declining or undeveloped, e.g., population <500,000
	b) Competition	5%	No competition; no change in foreseeable future.	Very limited competition; no change in foreseeable future.	Well-established and stable competitive environment; little change in foreseeable future.	Stable competitive environment, but competition may intensify over the long term with gradual impact.	Competitive environment; may intensify over the medium term with gradual impact.	Changing competitive environment; likely to decrease margins over the medium term.	Rapidly changing competitive environment; likely to decrease margins over the short term.
	c) Volume Risk & Throughput Trend	5%	Nil long term volume risk; exceptionally strong commercial outlook, e.g., sustainable 50% increase in throughput over 3 yrs.	Modest long term volume risk; strong commercial outlook, e.g. sustainable 30% to 50% increase in throughput over 3 yrs.	Modest medium term volume risk; good commercial outlook, e.g. sustainable 10% to 30% increase in throughput over 3 yrs.	Limited medium term volume risk; good commercial outlook; pipe full or moderately increasing throughput, e.g. 0% to 10% over 3 yrs.	Material medium term volume risk; steadily decreasing throughput, e.g. 0% to -25% over 3 yrs.	Significant near term volume risk; rapidly decreasing or uncertain throughput, e.g. -25% to -50% over 3 yrs.	Extraordinarily decreasing or uncertain throughput, e.g. -50% or more over 3 yrs.
FACTOR 2									
Natural Gas Pipelines									
Factor 2	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Quality of Supply Source (10%)	Supply Source	10%	Numerous supply areas with exceptionally high production e.g., >20,000 BCF p.a.	Numerous supply areas with very high production, e.g., >10,000 BCF p.a.	Several supply areas with very high production, e.g., >5,000 BCF p.a. (or >1,000 BCF p.a. with very strong growth outlook); excellent access to markets	Some diversity in supply areas with substantial production, e.g., >1,000 BCF p.a. (or >500 BCF p.a. with very strong growth outlook); reasonable access to markets	Concentration in supply areas with moderate production, e.g., >500 BCF p.a. (or >250 BCF p.a. with strong growth outlook); some limitation in access to markets	Reliance on supply area with low/declining production, e.g., >250 BCF p.a.	Reliance on supply area with very low/fast declining production, e.g., <250 BCF p.a.

FACTOR 3

Natural Gas Pipelines

Factor 3	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Contract Quality (30%)	a) Firm Revenues	10%	Firm agreements comprise 100% of revenues or capacity.	Firm agreements comprise 90 < 100% of revenues or capacity.	Firm agreements comprise 80 < 90% of revenues or capacity.	Firm agreements comprise 70 < 80% of revenues or capacity.	Firm agreements comprise 60 < 70% of revenues or capacity.	Firm agreements comprise 50 < 60% of revenues or capacity.	Firm agreements comprise < 50% of revenues or capacity.
	b) Contract Life	10%	Average remaining life of contract of > 30 yrs.	Average remaining life of contract of 15 to 30 yrs.	Average remaining life of contract of 7 to 15 yrs.	Average remaining life of contract of 5 to 7 yrs.	Average remaining life of contract of 3 to 5 yrs.	Average remaining life of contract of 2 to 3 yrs.	Average remaining life of contract of < 2 yrs.
	c) Shipper Quality / Re-contracting Risk	10%	Well-diversified portfolio of longstanding shippers with a weighted average rating of Aaa; certain to renew contracts	Well-diversified portfolio of longstanding shippers with a weighted average rating of Aa; highly likely to renew contracts	Reasonably diverse portfolio of longstanding shippers with a weighted average rating of A; likely to renew contracts	Concentrations in some shippers with a weighted average rating of Baa; a few may not renew contracts	Shippers with a weighted average rating of Ba; several may not renew contracts	Shippers with a weighted average rating of B; some will not renew contracts	Shippers with a weighted average rating of Caa; many will not renew contracts

FACTOR 4

Natural Gas Pipelines

Factor 4	Sub-Factor	Weight	Aaa	Aa	A	Baa	Ba	B	Caa
Financial Strength (45%)	a) FFO + Interest / Interest (1 yr)	15%	> 7x	6 - 7x	5 - 6x	4 - 5x	3 - 4x	2 - 3x	< 2x
	b) FFO / Debt (1 yr)	15%	> 60%	40 - 60%	25 - 40%	15 - 25%	10 - 15%	5 - 10%	< 5%
	c) FFO - Dividends / Debt (1 yr)	15%	> 35%	25 - 35%	18 - 25%	12 - 18%	6 - 12%	0 - 6%	< 0%

Appendix B: Observations and Outliers for Grid Mapping

Observations and Outliers			
Issuer	Rating	Outlook	Grid Indicated Rating
Alliance Pipeline L.P.	A3 (1)	Stable	Baa2
Alliance Pipeline Limited Partnership	Baa1	Stable	Baa3
ANR Pipeline Company	A3	Stable	A3
Colorado Interstate Gas Company	Baa3	Stable	Baa2
El Paso Natural Gas Company	Baa1	Stable	Baa3
Florida Gas Transmission Company, LLC	Baa2	Stable	Baa1
Gas Transmission Northwest LLC	A3	Stable	Baa1
Gulf South Pipeline Company, LP	Baa1	Stable	Baa1
Gulfstream Natural Gas System L.L.C.	Baa2	Stable	Baa2
Iroquois Gas Transmission System, L.P.	A3	Stable	Baa1
JSC KazTransGas	Baa3 (2)	Stable	A3
Kern River Funding Corporation	A3	Stable	A2
Maritimes & Northeast Pipeline Ltd Partnsh	A2 (1)	Stable	Baa2
Maritimes & Northeast Pipeline, LLC	Ba1 (3)	Negative	Ba1
Midcontinent Express Pipeline LLC	Ba1 (3)	Stable	Ba1
NGPL PipeCo. LLC	Ba3 (3)	Negative	Ba3
Northern Natural Gas Company	A2	Stable	A3
Northwest Pipeline GP	Baa1	Stable	A3
Panhandle Eastern Pipe Line Company, LP	Baa3	Stable	Baa2
Questar Pipeline Company	A3	Stable	A3
Rockies Express Pipeline LLC	Ba1 (3)	Stable	Ba1
Ruby Pipeline, LLC	Baa3	Stable	Ba2
Southeast Supply Header, LLC	Baa3	Stable	Baa3
Southern Natural Gas Company	Baa3	Stable	Baa1
Southern Star Central Corp.	Ba1	Stable	Ba1
Tennessee Gas Pipeline Company	Baa1	Stable	Baa1
Texas Eastern Transmission L.P.	Baa1	Stable	A2
Texas Gas Transmission, LLC	Baa1	Stable	Baa1
Transcontinental Gas Pipe Line Corporation	Baa1	Stable	A2
Transportadora de Gas Internacional S.A. E.S.P.	Baa3 (4)	Stable	Ba1
Transportadora de Gas del Sur S.A.	B3 (4)	Negative	Ba3

(1) Senior secured rating. In project finance, typically the fundamental rating reflecting the benefits of security and other enhancements.

(2) LT Issuer Rating (Foreign Currency).

(3) Corporate Family Rating.

(4) Senior Unsecured (Foreign Currency).

Factor 1: Outlier Discussion

Market Position

Positive outliers on the Market Position factor include pipelines in the southeastern US, where there is above-average demand growth, or those that have recently completed large expansions, but whose ratings are suppressed by a leveraged parent company. Florida Gas Transmission exemplifies such a positive outlier, as it is the dominant gas supplier to Florida, an isolated market that has the most growth potential in North America, and it recently completed yet another phase of expansion. All three pipelines outside of North America are positive outliers due to their strong competitive positions, which are limited by the credit quality of their countries. Negative outliers include regionally concentrated pipelines that have recently seen throughput declines from increased competition (Gas Transmission Northwest) or decreasing gas supplies (Maritimes and Northeast Pipeline LP).

Factor 2: Outlier Discussion

Quality of Supply Sources

The negative outliers on the Quality of Supply Sources factor include pipelines, such as Northern Natural and Questar, which have fairly average supply profiles but very strong balance sheets. The Maritimes & Northeast pipelines are also negative, because the gas field it was built to serve is fast declining. Structural enhancements that are part of the pipelines' project financing offset these negative supply trends.

Factor 3: Outlier Discussion

Contract Quality

All outliers in the Contract Quality factor are positive. The positive outliers usually involve A-rated utility customers that have entered into decade-long contracts that are substantially for firm services, and include a number of southeastern pipelines such as Southern Natural and Southeast Supply Header.

Factor 4: Outlier Discussion

Financial Strength

Most North American outliers in the Financial Strength factor are negative. These are mostly pipelines of recent vintage, such as Ruby and Rockies Express, or those that have recently changed ownership, such as NGPL. These negative outliers show pipeline owners' increased willingness to put more debt on these stable assets. Outside North America, two out of three pipelines are positive outliers, because their strong financial ratios are limited by the credit quality of their countries. Transportadora de Gas Internacional is the single negative outlier, due to the large capital expenditure program that is temporarily weakening its financial performance.

Appendix C: Overview of Gas Pipelines in North America and Key Credit Issues Over the Intermediate Term

The shale gas phenomenon, the biggest change for the North American pipeline sector over the last three years, has been credit positive because it has spurred organic growth.³ Pipelines have experienced rising throughput and revenues by connecting to new supplies. In the second half of this decade, pipelines will also see revenue growth from gas-fired power generation particularly in regulated power markets.

North American gas resources have proven to be robust, and natural gas as the current fuel of choice is good for the pipeline industry in the long term. In the interim, over the next few years, however, we expect some pipelines' business risk to rise, as the ever-faster pace of development in many areas has raised uncertainty as supply shifts have become more dynamic, upending the reason why some pipelines were built.

During this period of adjustment over the next few years, we believe that the pipeline industry will effectively mitigate this increased business risk through diversification, long-term contracts, and rate cases. We believe that the risk of a pipeline asset becoming stranded is low, considering the long lead time afforded by multi-year contracts and the industry's good track record in its commercial activities.

Pipelines will see new demand from power generation, but it will take several years to materialize. New power revenues will be concentrated in regulated electric markets, like the southeastern US, where utilities are willing to enter into long-term contracts. Merchant power generators in unregulated markets are less likely to do so. Significant changes will need to be made between the gas and electric industries for pipelines to realize the full potential from gas-fired power generation.

³ For more information about trends in the North American pipeline industry, refer to our Special Comment [Gas Pipeline Navigate Shifts in Supply and Demand](#), July 2012.

Moody's Related Research

Special Comments:

- » [Gas Pipelines Navigate Shifts in Supply and Demand, July 2012 \(143576\)](#)
- » [US Electric Power Generation Volumes: Slow Shift in Electric Generation Mix Favors Natural Gas, Renewables at the Expense of Coal, June 2012 \(141980\)](#)
- » [Low Natural Gas Prices Herald Long-Term Changes in US Energy Infrastructure, April 2012 \(140797\)](#)
- » [Pipeline Safety Costs Rising As Alternative Rate Designs Sought, April 2012 \(137329\)](#)
- » [Anemic Pipeline ROE Trends Reduce Risk of FERC Pipeline Rate Investigations: Cash flow metrics holding steady as North American pipeline grid reconfigures, January 2012 \(136950\)](#)
- » [US Natural Gas: Low Prices Pose Little Trouble for Midwest Natural Gas Companies, May 2011 \(133445\)](#)
- » [Marcellus Stokes Pipeline Competition for the New York Gas Market, June 2010 \(125833\)](#)

Issuer Comments:

- » [Spectra Energy Signs Agreement for Pipeline Expansion, a Credit Positive, January 2012 \(139336\)](#)
- » [US Regulatory Support for NiSource Pipeline Modernization Is Credit Positive, April 2012 \(141694\)](#)
- » [TransCanada's Rate Request Meets Opposition, a Credit Negative, June 2012 \(142942\)](#)

Industry Outlooks:

- » [Global Independent Exploration and Production: High Oil Prices Spur E&P Companies to Push Liquids Production, May 2012 \(141678\)](#)
- » [North American Midstream Sector: Booming Demand for New Oil and NGL Infrastructure Trumps Weak Natural Gas Prices, March 2012 \(140955\)](#)
- » [US Regulated Utilities: Stable Despite Rising Headline Rhetoric, January 2012 \(137878\)](#)

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

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Approved Natural Gas Rate Cases

Date	Company	State	Common Equity
			Ratio
1/15/20	MDU Resources Group Inc.	WY	51.25
1/16/20	Consolidated Edison Co. of NY, Inc.	NY	48.00
1/24/20	Roanoke Gas Co.	VA	59.64
2/3/20	Cascade Natural Gas Corp.	WA	49.10
2/24/20	Atmos Energy Corp.	KS	56.32
2/25/20	Questar Gas Co.	UT	55.00
2/28/20	Fitchburg Gas and Electric Light Co.	MA	52.45
3/25/20	Avista Corp.	WA	48.50
3/26/20	Northern Utilities, Inc.	ME	50.00
4/21/20	Atmos Energy Corp.	TX	60.12
5/19/20	Black Hills Colorado Gas, Inc.	CO	50.15
6/16/20	CenterPoint Energy Resources Corp.	TX	56.95
7/8/20	Puget Sound Energy, Inc.	WA	48.50
8/4/20	Texas Gas Service Co., Inc.	TX	59.00
8/21/20	Questar Gas Co.	WY	55.00
9/14/20	Chattanooga Gas Co.	TN	49.23
9/23/20	South Jersey Gas Co.	NJ	54.00
9/25/20	Southwest Gas Corp.	NV	49.26
9/25/20	Southwest Gas Corp.	NV	49.26
10/7/20	Eversource Gas Co. of Mass.	MA	53.25
10/12/20	Public Service Co. of Colorado	CO	55.62
10/16/20	Northwest Natural Gas Company	OR	50.00
10/30/20	NSTAR Gas Company	MA	54.77
11/7/20	Columbia Gas of Maryland, Corp.	MD	52.63
11/19/20	New York State Electric & Gas Corp.	NY	48.00
11/19/20	Rochester Gas and Electric Corp.	NY	48.00
11/24/20	Madison Gas and Electric Company	WI	55.00
12/9/20	Southwest Gas Corporation	AZ	51.10
12/10/20	Avista Corporation	OR	50.00
12/16/20	Baltimore Gas and Electric Co.	MD	52.00
12/16/20	New Mexico Gas Company, Inc.	NM	52.00
12/21/20	Mountaineer Gas Company	WV	50.60
12/23/20	Wisconsin Power and Light Co.	WI	52.53
1/1/21	Atlanta Gas Light Co.	GA	56.00
1/6/21	Delmarva Power & Light Co.	DE	50.37
1/6/21	Cascade Natural Gas Corp.	OR	50.00
1/13/21	Ameren Illinois Co.	IL	52.00
1/26/21	Black Hills/Nebraska Gas Utility Co.	NE	50.00
2/16/21	Piedmont Natural Gas Co. Inc.	TN	50.50
2/19/21	Columbia Gas of Pennsylvania Inc.	PA	54.19

Approved Natural Gas Rate Cases

Date	Company	State	Common Equity
			Ratio
2/24/21	Washington Gas Light Co.	DC	52.10
3/25/21	Southwest Gas Corp.	CA	52.00
3/25/21	Southwest Gas Corp.	CA	52.00
3/25/21	Southwest Gas Corp.	CA	52.00
4/9/21	Washington Gas Light Co.	MD	52.03
5/5/21	MDU Resources Group Inc.	ND	50.31
5/18/21	Cascade Natural Gas Corp.	WA	49.10
5/19/21	Corning Natural Gas Corp.	NY	48.00
6/17/21	PECO Energy Co.	PA	53.38
7/19/21	Atmos Energy Corp.	TN	59.88
7/27/21	Hope Gas Inc.	WV	46.26
7/30/21	Liberty Utilities Corp.	NH	52.00
8/12/21	Brooklyn Union Gas Co.	NY	48.00
8/12/21	KeySpan Gas East Corp.	NY	48.00
9/1/21	Avista Corp.	ID	50.00
9/8/21	North Shore Gas Co.	IL	51.58
9/14/21	Virginia Natural Gas Inc.	VA	51.89
9/27/21	Avista Corp.	WA	48.50
9/30/21	Boston Gas Co.	MA	53.44
10/27/21	Spire Missouri Inc.	MO	49.86
11/17/21	New Jersey Natural Gas Co.	NJ	54.00
11/18/21	Atlanta Gas Light Co.	GA	56.00
11/18/21	Northern Illinois Gas Co.	IL	54.46
11/18/21	Central Hudson Gas & Elec. Corp.	NY	50.00
11/18/21	Northern States Power Co.	WI	52.50
11/18/21	Wisconsin Power and Light Co.	WI	52.50
11/23/21	Madison Gas and Electric Co.	WI	55.00
11/30/21	Oklahoma Natural Gas Co.	OK	58.55
12/3/21	Columbia Gas of Maryland Inc.	MD	52.95
12/13/21	Black Hills Colorado Gas Inc.	CO	50.26
12/16/21	Mountaineer Gas Co.	WV	52.90
12/28/21	Black Hills Iowa Gas Utility Co.	IA	50.01
12/28/21	Columbia Gas of Kentucky Inc.	KY	52.64
12/28/21	Duke Energy Kentucky Inc.	KY	51.34
1/6/22	Piedmont Natural Gas Co. Inc.	NC	51.60
1/20/22	Niagara Mohawk Power Corp.	NY	48.00
1/21/22	Public Service Co. of NC, Inc.	NC	51.60
3/22/22	Southwest Gas Corp.	NV	50.00
3/22/22	Southwest Gas Corp.	NV	50.00
Average			51.96

Spread Calculation for the Cost of Debt

Date	Five Year Yield	Basis point Spread	Indicated Yield
May 17, 2017	1.76%	135	3.111%
May 27, 2022	2.71%	135	4.061%
		Rounded to	4.06%

Investment Risk Measures

Company Name	Value Line ¹						S&P ³	Moody's ³
	Safety	Beta	Fin. Stren.	Earnings Pred.	Stability Rank	Quality ² Ranking	Bond Rating	Bond Rating
1 Atmos Energy Corp.	1	0.80	A+	100	95	A	A-	A1
2 Chesapeake Util.	2	0.75	A	95	90	A	NA	NA
3 New Jersey Res.	2	0.95	A+	55	85	A	NA	A1
4 N.W. Natural	3	0.80	A	10	85	B+	A+	Baa1
5 One Gas, Inc.	2	0.80	B++	100	95	NA	BBB+	A3
6 South Jersey Inds.	3	1.00	B++	70	50	B	BBB	A3
7 Southwest Gas	3	0.90	A	90	80	A	BBB-	Baa2
8 Spire Inc.	2	0.80	B++	45	90	A-	A-	Baa2
9 UGI Corp.	2	1.05	B++	90	80	A	NA	NA
Average	2.2	0.87		73	83			

Sources:

- ¹ Value Line Reports for May 27, 2022.
- ² CFRA Stock Report, May 20, 2022.
- ³ S&P Global Market Intelligence, downloaded on May 23, 2022.

DCF ANALYSIS

Company	Yield ¹	Value Line Historical ^{2,4}						Value Line ² Forecast			Yahoo ³
		EPS 10-Yr	DPS 10-Yr	BPS 10-Yr	EPS 5-Yr	DPS 5-Yr	BPS 5-Yr	EPS 5-Yr	DPS 5-Yr	BPS 5-Yr	EPS 5-Yr
1 Atmos Energy Corp.	2.5	8.5	5.5	8.5	8.5	8.0	11.0	7.5	7.0	7.5	7.7
2 Chesapeake Util.	1.5	9.5	6.5	9.5	9.0	7.5	11.0	8.0	8.0	7.0	7.0
3 New Jersey Res.	3.3	5.0	6.5	7.5	2.5	6.5	7.0	4.5	5.0	4.0	6.0
4 N.W. Natural	3.8	-1.5	1.5	1.0	1.5	0.5	NMF	6.0	0.5	5.5	3.7
5 One Gas, Inc.	3.0	NMF	NMF	NMF	10.0	14.5	3.0	6.0	6.5	8.5	5.0
6 South Jersey Inds.	3.9	1.5	6.5	5.5	-1.5	4.0	2.5	10.0	3.5	4.0	5.2
7 Southwest Gas	3.2	7.5	8.5	6.0	5.5	8.0	7.0	8.0	5.0	6.0	4.0
8 Spire Inc.	3.9	2.0	4.5	6.5	2.5	6.0	4.5	9.0	5.0	7.0	4.3
9 UGI Corp.	3.8	5.5	8.0	7.0	6.0	8.0	6.0	7.0	3.5	9.5	7.0
Average	3.2	5.6	5.9	6.4	5.7	7.0	6.5	7.3	4.9	6.6	5.5
Average DCF Result		8.8	9.1	9.6	8.9	10.2	9.7	10.5	8.1	9.8	8.7

Source:

1. Value Line Investment Survey, Summary and Index from March 4, 2022 to May 20, 2022.
2. Value Line Investment Survey, Standard Edition, May 27, 2022.
3. Yahoo Earnings Forecast as of May 9, 2022.
4. Negative values are excluded from analysis.

REGRESSION ANALYSIS OF APPROVED RETURNS ON EQUITY
 FOR LOCAL NATURAL GAS DISTRIBUTION UTILITIES

		[A] General Rate Case Gas Utility Approved ROE ¹	[B] Moody's A-Rated Bond Yields ²	[C]=[A]-[B] Gas Utility Risk Premium
	Year			
1	2007	10.22%	6.05%	4.17%
2	2008	10.39%	6.51%	3.88%
3	2009	10.22%	6.04%	4.19%
4	2010	10.15%	5.47%	4.68%
5	2011	9.91%	5.04%	4.87%
6	2012	9.93%	4.13%	5.80%
7	2013	9.68%	4.48%	5.20%
8	2014	9.78%	4.28%	5.50%
9	2015	9.60%	4.12%	5.49%
10	2016	9.53%	3.93%	5.60%
11	2017	9.73%	4.00%	5.73%
12	2018	9.59%	4.25%	5.34%
13	2019	9.73%	3.77%	5.96%
14	2020	9.47%	3.02%	6.46%
15	2021	9.56%	3.11%	6.45%
16	2022	9.38%	3.66%	5.72%
			Average	5.32%

Sources:

¹ S&P Global Market Intelligence, Regulatory Research Associates, "Major Rate Case Decisions," May 2, 2022.

² Mergent Bond Record, May 2022.

REGRESSION ANALYSIS OF ALLOWED RETURNS ON EQUITY
 FOR LOCAL NATURAL GAS DISTRIBUTION UTILITIES

<i>Regression Statistics</i>	
Multiple R	0.92328782
R Square	0.8524604
Adjusted R Square	0.84192186
Standard Error	0.00120446
Observations	16

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.000117349	0.000117	80.8898	3.41632E-07
Residual	14	2.03102E-05	1.45E-06		
Total	15	0.000137659			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.08601635	0.001370769	62.75042	1.5E-18
X Variable 1	0.26790991	0.029788042	8.993875	3.4E-07

A-Rated Public Utility Bond Yield ¹	
Dec-21	3.13%
Jan-22	3.33%
Feb-22	3.68%
Mar-22	3.98%
Apr-22	4.32%
May-22	4.75%
Average	3.87%

Predicted Cost of Equity **9.64%**

Note:

$$\text{Predicted Cost of Equity of 9.64\%} = 0.0860164 + 0.2679099 \times 3.87\%$$

Source:

¹ Mergent Bond Record, May 2022.

Comparable Earnings Analysis¹

Company Name	2017	2018	2019	2020	2021	Average	
						Last 3 Years	Last 5 Years
1 Atmos Energy	9.80%	9.30%	8.90%	8.50%	8.40%	8.60%	8.98%
2 Chesapeake Util.	9.00%	10.90%	10.90%	10.10%	10.80%	10.60%	10.34%
3 New Jersey Res.	12.10%	16.90%	11.30%	10.60%	12.70%	11.53%	12.72%
4 N.W. Natural	NMF	8.80%	7.50%	7.90%	8.40%	7.93%	8.15%
5 One Gas, Inc.	8.20%	8.40%	8.80%	8.80%	8.80%	8.80%	8.60%
6 South Jersey Inds.	8.20%	9.20%	7.20%	9.80%	9.00%	8.67%	8.68%
7 Southwest Gas	9.60%	8.10%	8.50%	8.70%	6.80%	8.00%	8.34%
8 Spire Inc.	8.10%	9.50%	7.90%	3.20%	10.60%	7.23%	7.86%
9 UGI Corp.	12.90%	13.20%	10.80%	13.60%	7.70%	10.70%	11.64%
Average	9.74%	10.48%	9.09%	9.02%	9.24%	9.12%	9.51%
Median	9.30%	9.30%	8.80%	8.80%	8.80%	8.80%	9.00%

Sources:

¹ Value Line Investment Survey, Standard Edition, May 27, 2022.

Cost of Equity Summary

<hr/>		
<u>DCF Method</u>		
Based on Average Historical		9.38%
Based on Historical & Forecasted Growth Rates		9.34%
Based on Predicted Growth Rates		9.28%
	Average	9.33%
<hr/>		
Risk Premium Method		9.64%
	Average ¹	9.48%

Note:

¹. 9.48% = average of 9.33% and 9.64%.

Investment Risk Measures

Company Name	Value Line ¹					Quality ² Ranking	S&P ³	Moody's ³
	Safety	Beta	Fin. Stren.	Earning s Pred.	Stability Rank		Bond Rating	Bond Rating
1 Kinder Morgan, Inc.	3	1.15	B	25	75	B	BBB	Baa2
2 Pembina Pipeline	3	1.10	B++	15	60	A-	BBB	NA
3 TC Energy Corp.	3	1.05	B++	15	85	B+	BBB+	Baa1
4 Willams Cos.	3	1.20	B	75	65	B	BBB	Baa2
Average	3.0	1.13		33	71			

¹ Value Line Reports for May 27, 2022.

² CFRA Stock Report, May 20, 2022.

³ S&P Global Market Intelligence, downloaded on May 23, 2022.

Cardinal Pipeline Company, LLC.
Overall Cost of Capital
as of December 31, 2022

Item	Ratios	Cost Rate	Weighted Cost Rate	Pre-Tax Cost of Capital
Long-Term Debt	48.04%	4.06%	1.95%	1.95%
Common Equity	51.96%	9.48%	4.93%	6.40%
Total	100.00%		6.88%	8.36%

Pre-Tax Interest Coverage 4.3