MISSOURI PUBLIC SERVICE COMMISSION

STAFF REPORT

COST OF SERVICE

APPENDIX 2

Detailed Direct Testimony of
David Murray

and

Support for Staff
Cost of
Capital Recommendations

LIBERTY UTILITIES (Midstates Natural Gas) CORP.,

d/b/a LIBERTY UTILITIES

CASE NO. GR-2018-0013

Jefferson City, Missouri
March 2018

** Denotes Confidential Information **

Exhibit No.:	
Issues:	*Rate of Return*
	Capital Structure
Witness:	*David Murray, CFA*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Detailed Direct Testimony*
Case No.:	*GR-2018-0013*
Date Testimony Prepared:	*March 2, 2017*

MISSOURI PUBLIC SERVICE COMMISSION

COMMISSION STAFF DIVISION

FINANCIAL ANALYSIS UNIT

DETAILED DIRECT TESTIMONY

OF

DAVID MURRAY, CFA

LIBERTY UTILITIES (Midstates Natural Gas) CORP.

d/b/a LIBERTY UTILITIES

CASE NO. GR-2018-0013

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DAVID MURRAY, CFA

LIBERTY UTILITIES (MIDSTATES NATURAL GAS) CORP.
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Rate of Return (ROE, Cost of Capital, Capital Structure)

A. Summary

Based on my rate-of-return analyses and consideration of the Commission's recent decision in the Spire Missouri Inc. rate cases, I recommend that the Commission set the Company's return on equity ("ROE") at 10% (based on a range of 9.5% to 10%), resulting in an overall rate of return ("ROR") of 6.76% (range of 6.56% to 6.76%). My recommended ROE provides the Company with a fair and reasonable opportunity to earn at least its cost of common equity ("COE") in view of the fact that my analyses show that the COE for gas utilities is most likely in the range of 6% to 7%.

I recommend the Commission use LUCo's adjusted capital structure for purposes of setting Liberty Midstates allowed ROR because this capital structure is that which is used to finance LUCo's United States' regulated utility assets, including that of Liberty Midstates.[1] Staff considered several other different capital structures, which I will discuss in the "capital structure" Section.

Consistent with my capital structure recommendation, I also recommend that the Commission use LUCo's embedded cost of debt, 4.51%, which includes debt transferred to

[1] Calculated with short-term debt removed.

intermediate holding companies, but which debt is still used for investment in LUCo's assets, resulting in an overall ROR of 6.76% (range of 6.56% to 6.76%).

B. Introduction

The purpose of my report is to present Staff's cost-of-capital recommendation in this case. These recommendations reflect my considered professional judgment and are based upon a careful analysis of the economic and financial data reasonably relied upon by cost-of-capital witnesses in cases of this sort. In reaching my opinion, I have employed the analytical methods generally utilized for cost-of-capital analysis in the context of utility ratemaking. I am qualified as an expert in the area of cost of capital by reason of my education, training, experience, knowledge, and skill; and my detailed qualifications are attached to this report as an appendix.

In my report, I will intentionally differentiate between the market-determined COE and the allowed ROE because it is clear from my continuous and regular review of utility stock investment analyses that equity analysts use a COE, i.e. discount rate, to value utility stocks that is much lower than average ROEs allowed by state utility regulatory commissions.[2]

The three issues related to cost-of-capital are: (1) ROE; (2) capital structure; and (3) cost of debt. With respect to ROE, the Commission recently awarded an ROE of 9.8% to Spire Missouri in its rate cases. To the extent the Commission uses a similar capital structure, such as that recommended by the Company witness in this case, then it would be reasonable to use this same allowed ROE for purposes of developing rates for the Liberty Midstates' assets.

[2] The cost of common equity is the return required by investors, determined by expert analysis of market data relating to a carefully-constructed group of proxy companies. The allowed ROE, on the other hand, is the value selected by the Commission for use in calculating a utility's forward-looking rates for implementation at the end of the rate case.

C. Analytical Parameters

The determination of a fair rate of return is guided by principles of economic and financial theory and by certain minimum Constitutional standards. Investor-owned public utilities such as Liberty Midstates are private property that the state may not confiscate without appropriate compensation. The Constitution requires, therefore, that utility rates set by the government must allow a reasonable opportunity for the shareholders to earn a fair return on their investment. The United States Supreme Court has described the minimum characteristics of a Constitutionally-acceptable rate of return in two frequently-cited cases: In ***Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia*****,** 262 U.S. 679, *43 S.Ct. 675, 67 L.Ed. 1176* (1923) and ***Federal Power Commission v. Hope Natural Gas Co.*****,** 320 U.S. 591, 64 S.Ct. 281, 88 L.Ed. 333 (1943).

From these two decisions, Staff derives and applies the following principles to guide it in recommending a fair and reasonable ROR:

1. The rates set by the Commission must provide a return consistent with returns realized from other investments of comparable risk;

2. The rates set by the Commission must provide a return sufficient to assure confidence in the utility's financial integrity; and

3. The rates set by the Commission must provide a return that allows the utility to attract capital.

Embodied in these three principles is the economic theory of the opportunity cost of investment. The opportunity cost of investment is the return that investors forego in order to invest in similar risk investment opportunities that vary depending on market and business conditions.

The methodologies of financial analysis have advanced greatly since the ***Bluefield*** and ***Hope*** decisions.[3] Additionally, today's utilities compete for capital in a global market rather than a local market. Nonetheless, the parameters defined in those cases are readily met using current methods and theory. The principle of the commensurate return is based on the concept of risk. Financial theory holds that the return an investor may expect is reflective of the degree of risk inherent in the investment, risk being a measure of the likelihood that an investment will not perform as expected by that investor. Any line of business carries with it its own peculiar risks and it follows, therefore, that the return Liberty Midstates' shareholders may expect is equal to that required for comparable-risk utility companies.

I have relied primarily on my analysis of a comparable group of companies to estimate the COE for Liberty Midstates, applying this comparable-company approach through the use of both the Discounted Cash Flow ("DCF") method and the Capital Asset Pricing Model ("CAPM"). Properly used and applied in appropriate circumstances, both the DCF and the CAPM can provide accurate estimates of a utility's COE. It is well-accepted economic theory that a company that earns its cost of capital will be able to attract capital and maintain its financial integrity; therefore, an *allowed* return on common equity based on the *cost* of common equity is consistent with the principles set forth in ***Hope*** and ***Bluefield***. However, allowed ROEs have consistently been set higher than the COE due to a continued very low cost of capital environment. Consequently, my recommended allowed ROE is higher than my estimate of Liberty Midstates' COE.

I used the Commission's recently authorized ROE of 9.8% for Spire Missouri in Case Nos. GR-2017-02215 and GR-2017-0216 as a benchmark to determine a just and reasonable

[3] Neither the Discounted Cash Flow ("DCF") nor the Capital Asset Pricing Model ("CAPM") methods were in use when those decisions were issued.

allowed ROE for Liberty Midstates.[4] I will provide the Commission an update on changes in the broader and utility-specific capital markets since it heard evidence in the Spire Missouri rate cases. In Staff's opinion, although utility stocks have experienced a significant contraction in the last couple of months, because utility valuation levels were at or near all-time highs before this contraction, these changes do not warrant a change to the baseline allowed ROE. However, if the Commission adopts LU Co.'s actual adjusted capital structure, then an approximate 20 basis point upward adjustment is warranted.

D. Current Economic and Capital Market Conditions

Determining whether a cost of capital estimate is fair and reasonable requires a good understanding of the current economic and capital market conditions, with the former having a significant impact on the latter. With this in mind, I emphasize that an estimate of a utility's COE must pass the "common sense" test when considering the broader current economic and capital market conditions.

Economic Conditions

Real Gross Domestic Product ("GDP") increased by 2.3% for the 2017 calendar year.[5] The quarterly year-over-year ("YoY") growth for 2017 breaks out as follows: 1.2% for the first quarter, 3.1% for the second quarter, 3.2% for the fourth quarter and 2.6% for the fourth quarter.[6] As of December 2017 the Federal Reserve Board Members and the Federal Reserve Bank Presidents projected real GDP would grow in the range of 2.2% to 2.6% in 2018; 1.9% to 2.3% in 2019; and 1.7% to 2.0% in 2020. This compares to the Fed's projected real GDP growth in

[4] ***In the Matter of Kansas City Power & Light Company,*** Case No. ER-2016-0285 (***Report & Order,*** issued May 3, 2017) at p. 22.

[5] https://www.bea.gov/national/xls/gdpchg.xlsx

[6] *Id.*

September 2017 (pre-tax reform) of 2.0% to 2.3% in 2018; 1.7% to 2.1% in 2019; and 1.6% to 2.0% in 2020. The longer run projections for real GDP growth were between 1.8% and 1.9% as of December 2017, compared to 1.8% and 2.0% as of September 2017.[7]

In December 2017, the Federal Open Market Committee ("FOMC") agreed to raise the benchmark rate a quarter point, which stands at 1.25% – 1.50%. Since December 2015, the Fed has increased the rate five times. The following was stated in the February 1, 2018 edition of the Wall Street Journal:

> The Fed held its benchmark short-term interest rate steady in a range between 1.25% and 1.5% and offered nothing to dispel market expectations that it would deliver its next rate increase in March.
>
> The policy statement released Wednesday signaled greater confidence in officials' upbeat economic outlook. In December, Fed officials raised rates to their current range and penciled in three increases for 2018. The statement hinted that officials might favor more than three rate increases this year because it offered slightly more conviction that inflation would pick up in 2018.[8]

Although the FOMC did not raise the Fed Funds rate at its January 2018 meeting, 10-Year Treasury rates increased by approximately 40 basis points in January. This recent reflation of US Treasury rates follows on the heels of consistent 10-Year Treasury yields of around 2.3% to 2.4% from the spring of 2017 through the end of 2017. The last time the 10-Year Treasury yield reached the recent higher levels was in early April 2014. The 30-year Treasury yield also increased in January 2018, trading at a yield-to-maturity ("YTM") of approximately 3% at the beginning of February 2018. While the YTM on the 30-year Treasury is currently higher than it was during most of 2017, the 30-year Treasury traded at similar YTM levels at the end of 2016 and in early 2017. The pattern of expectations of a sustained increase in

[7] https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20171213.pdf

[8] Nick Timiraos, "As Yellen Departs, Fed Holds Steady," *Wall Street Journal*, February 1, 2018, pp. A1-A2.

long-term rates, only to be followed by rates settling back into the 30+ year long-term trend of decline, has been fairly consistent in the last few years. Whether the recent increase in long-term yields will be sustained is a matter for the markets to decide based on unfolding market and economic conditions. However, due to the fact that there has been a narrowing in spreads between long-term yields and short-term yields implies the market is not entirely convinced long-term rates will remain at current levels. Schedule 4-3 attached shows that since 2010 there have been approximately four periods in which long-term rates rallied for a couple of months, only to return to their previous levels, or even lower.

Capital Market Conditions

Utility Debt Markets

Utility debt yields have not increased nearly as much as 10-year US Treasury yields. Through the end of 2017, public utility bonds have traded at a YTM about 15 basis points higher than their all-time lows during the summer of 2016. Utility bond yields are generally lower than levels that existed at the end of 2016 and early 2017 when the Commission decided a 9.5% allowed ROE was appropriate for Kansas City Power & Light Company in Case No. ER-2016-0285, but at about the same level as when the Commission determined an allowed ROE of 9.8% was appropriate for Spire Missouri Inc. in Case Nos. GR-2017-0215 and GR-2017-0216.

If one were to assume that the risk premium[9] required for investing in utility stocks rather than utility bonds was constant, then a change in utility debt yields would correspond to a one-for-one change in required returns on equity as well. Although it is unlikely that the change in utilities' COE will be perfectly correlated to changes in utility debt yields, it is widely recognized

[9] Risk Premium in this context is the excess required return to invest in a company's equity rather than its debt.

in the investment community that regulated utility stocks are a close alternative to bond investments and, therefore, that they are highly correlated over time.

The average utility bond yield based on the Moody's public utility bond index for November 2017 through January 2018 was 3.88%. The average for December 2016 through February 2017, the period consistent with the "reflation" trade, was 4.29%. The average for the March 2017 through September 2017 period was 4.09%. As compared to 2014, when average allowed ROEs for gas utilities were 9.6%, utility bond yields are currently around 35-45 basis points lower (*see* Schedules 4-1 and 4-3).

For the most recent three months, the average spread between 30-year T-bonds (2.82%) and average utility bond yields (3.88%) was 106 basis points. For the three months through January 2017 (the general period for the data analyzed in the recent KCPL rate case), the average spread between the 30-year T-bonds (3.00%) and average utility bond yields (4.28%) was 128 basis points. The decrease in the spread can be attributed to a larger decline in utility bond yields as compared to 30-year T-bond yields (*see* Schedules 4-3 and 4-4).

In summary, while US Treasury yields increased during January 2018, utility debt markets imply there has not been much of a change in the utility capital costs in recent months.

Utility Equity Markets

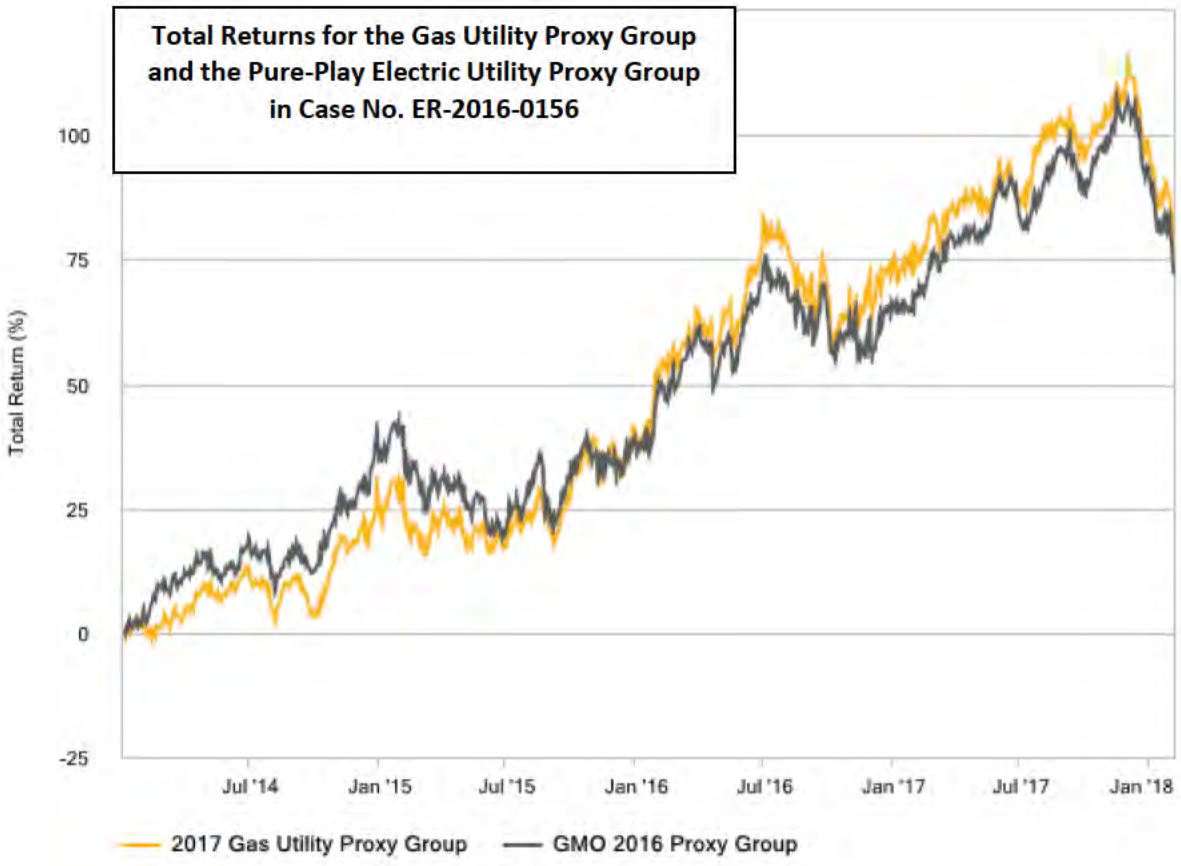
Traditionally, over long-term market periods, the total returns on the Standard & Poor's ("S&P") 500 (a proxy for the U.S. capital markets) are expected to be greater than total returns on utility stocks because the S&P 500 is expected to grow at a higher rate than utilities, and investors in the S&P 500 incur greater risk than do investors in utility stocks. This expectation is supported by a common portfolio statistical measure referred to as the "beta" of the stock which measures the covariance of a portfolio or asset as compared to the variance of the market as a

whole. Betas for regulated utility portfolios have consistently measured in the 0.60 to 0.80 range over long periods of time, with most regulated utilities typically having betas of around 0.70. This measurement typically implies that utility stocks should lag the S&P 500 in both gains and losses over long holding periods. Until recently, utility stocks significantly outperformed the S&P 500, which was largely attributed at that time to the slow growth, low long-term interest rate environment.

For the period from January 1, 2014, through February 5, 2018, the total returns on the S&P 500 and the S&P Utilities were 64.06% and 53.91%, respectively. For the period, January 1, 2014, through December 31, 2017, the total returns on the S&P 500 and the S&P Utilities were 58.60% and 62.50%. Consequently, the broader markets significantly outperformed the utility markets during January 2018. However, utility markets have still done fairly well since 2014, when the Commission first decided a 9.5% allowed ROE was appropriate for Missouri's large electric utilities. The 53.91% total return converts to a compound annual return of approximately 11.10%. Of course, because the gas and electric sectors of the utility industry have both risk and growth differences, it is important to compare and contrast the differences in capital market performance and metrics for these two subsectors of the utility industry. For this comparison, I chose to use the pure-play proxy group Staff used in the GMO rate case, Case No. ER-2016-0156, (pure-play companies are considered to be confined almost entirely to one business segment)[10] and the current gas proxy group in this rate case. For the period January 1, 2014 through February 5, 2018, the gas utility proxy group had a total return of 78.13% and the electric utility proxy group had a total return of 75.15%. This translates into a

[10] See pp. 31-32 of Staff's *Cost of Service Report* in Case No. ER-2016-0156. This proxy group consisted of the following companies: Alliant Energy, Ameren Corporation, CMS Energy Corporation, Northwestern Corporation, Pinnacle West Capital, PNM Resources Inc., Portland General Electric Company, and Xcel Energy.

compound annual total return of 15.15% for the gas proxy group and 14.67% for the electric proxy group. The compound annual return for these same proxy groups was 21.45% and 20.42%, respectively, through August 25, 2017, which was the period Staff reported on in the Spire Missouri rate cases. A graphical illustration of the total returns for the utility proxy groups follows.



Source: S&P Global Market Intelligence

As can be seen in the above graph, the total returns for the gas and electric proxy groups peaked at approximately 110% at the end of November 2017. Both proxy groups' stock prices have contracted significantly over the last couple of months. The following graph shows the significant underperformance of utility stocks compared to the S&P 500 over these last couple of months:

Source: S&P Global Market Intelligence

While the contraction of utility stocks during the last couple of months is unquestionably due to an increase in utility cost of equity, it was also widely recognized that utility stocks were trading at all-time highs, meaning that the costs of equity to utilities were at all-time lows. Staff has repeatedly provided corroborating information from utility stock analysts and financial advisors that supported Staff's position that the cost of equity is in the 6% to 7% range. Utility equity analysts have continuously observed the significant spread between allowed ROEs and the cost of equity. While utility equity analysts certainly do not expect commissions to reduce allowed ROEs to a point where they would be at parity with the COE, they do expect the spread to eventually compress either due to an increase in the COE, a reduction in allowed ROEs, or a combination of both. If utilities' costs of equity should gravitate back to levels experienced

during higher interest rate periods and commissions hold allowed ROEs steady, then this compression will occur naturally due to changes in market costs caused by macro factors.

However, even with the recent contraction in utility stock prices, it is still important to understand the historical relationship of utility stocks as compared to broader markets during certain interest rate cycles. Goldman Sachs' analysis consistently shows that utilities typically trade at a premium to the market when U.S. 10-year treasury yields trade below the 3% level and trade at a discount to the market when U.S. 10-year treasury yields trade above 3%. Although the 10-year Treasury yield has increased significantly since the end of the year, recently trading at a YTM of around 2.9%, it is still below 3%, which is still low by historical standards. As Staff discussed earlier, the 10-Year Treasury traded at this level in 2014 when the Commission decided allowed ROEs of approximately 9.5% were fair and reasonable for its major electric utility companies. The Commission decided that a 10% allowed ROE was fair and reasonable for Liberty Midstates before it made its decisions for Ameren Missouri and Kansas City Power & Light Company.

For these reasons, it would be insightful to observe the price-to-earnings ratios for the gas and electric utilities from January 1, 2014 through the current period. Staff relied on its access to S&P Global Capital IQ for the following chart:

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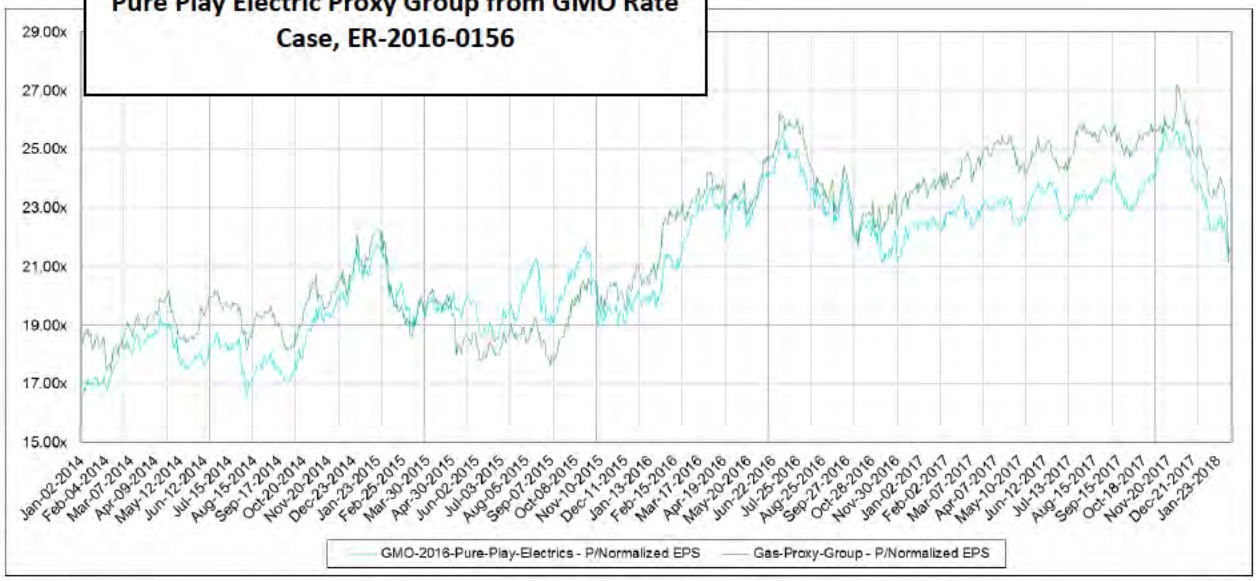
Price/Normalized EPS for Gas Proxy Group and Pure Play Electric Proxy Group from GMO Rate Case, ER-2016-0156



As can be seen in the above graph, even with the recent contraction in stock prices for both the gas and electric utility proxy groups, they are still trading at higher p/e ratios than they were for much of 2014. This information certainly implies that the Commission does not need to allow an ROE any higher than that which it authorized Spire Missouri in its recent rate cases.

Another useful metric to observe over this time period to help to determine a fair and reasonable allowed ROE in this case is that of the proxy groups' dividend yields, as shown in the following graph:

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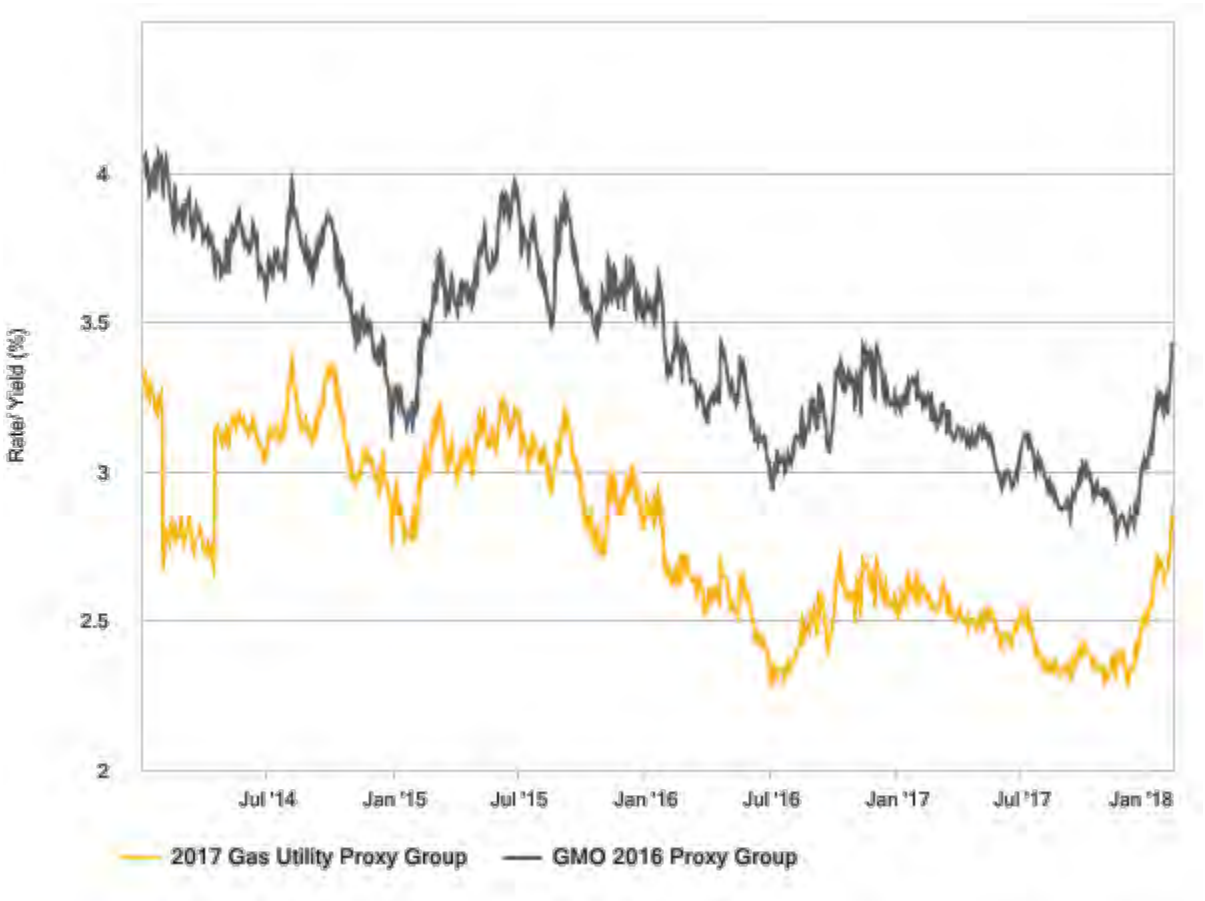

Source: S&P Global Market Intelligence

The utility proxy groups' dividend yields move inversely to that of their p/e ratios, which is logical considering the fact that the price of the stock is the denominator of the dividend yield ratio. Assuming the expected growth rate of the proxy groups' dividends has not changed much since 2014, then simply taking the difference in the dividend yields from one period compared to another will give you at least a starting point as to the change in the cost of equity over periods. Staff is not aware of any structural changes in both the gas and electric utility industries that would cause a significant change in long-term growth rates. Perhaps the most significant changes of late may be due to optimism about a boost to economic growth from Federal Tax Reform. However, this is not showing up in equity analysts projected CAGR in EPS for

regulated utilities. The largest impact on investors' expected rates of return on regulated utility stocks are the uncertainty about changes in interest rates.

In summary, although there has been some recent tightening in utility capital markets, Staff does not believe this should cause the Commission to change its baseline awarded ROEs from recent levels unless company-specific factors warrant such.

E. Operations of Algonquin Power & Utilities Corporation, Liberty Utilities Company and Liberty Utilities (Midstates Natural Gas) Corporation

Although Liberty Midstates is the petitioner in this rate case, Liberty Midstates does not operate as a stand-alone company. Liberty Midstates is managed by Liberty Utilities Services Corporation employees. Liberty Midstates does not issue debt directly to third-parties. Most of the independent third-party corporate debt financing occurs at the LUCo level. LUCo issues corporate debt through a financing subsidiary, Liberty Utilities Finance GP1 ("LUF"), but LUCo guarantees this debt. APUC is the ultimate holding company for LUCo. APUC also owns Liberty Power Company (formerly Algonquin Power Company). The following excerpts from APUC's September 30, 2017, Quarterly Report provide APUC's direct explanations of its business segments:

> APUC's operations are organized across two primary North American business units consisting of: the Liberty Power Group which owns and operates a diversified portfolio of non-regulated renewable and thermal electric generation assets; and the Liberty Utilities Group which owns and operates a portfolio of regulated electric, natural gas, water distribution and wastewater collection utility systems, and transmission operations.
>
> **Liberty Power Group**
>
> The Liberty Power Group generates and sells electrical energy produced by its diverse portfolio of non-regulated renewable power generation and clean power generation facilities located across North America. The Liberty Power Group seeks to deliver continuing growth through development of new greenfield power generation projects and accretive acquisitions of additional electrical energy generation facilities.

> The Liberty Power Group owns or has interests in hydroelectric, wind, solar, and thermal facilities with a combined generating capacity of approximately 120 MW, 1,050 MW, 40 MWac, and 335 MW, respectively. Approximately 88% of the electrical output from the hydroelectric, wind, and solar generating facilities is sold pursuant to long term contractual arrangements which have a production-weighted average remaining contract life of 16 years.

Liberty Utilities Group

> The Liberty Utilities Group operates a diversified portfolio of regulated utility systems throughout the United States serving approximately 758,000 customers. Liberty Utilities provides safe, high quality, and reliable services to its customers and delivers stable and predictable earnings to APUC. In addition to encouraging and supporting organic growth within its service territories, Liberty Utilities delivers continued growth in earnings through accretive acquisition of additional utility systems.
>
> The Liberty Utilities Group's regulated electrical distribution utility systems and related generation assets are located in the States of California, New Hampshire, Missouri, Kansas, Oklahoma, and Arkansas. The electric utility systems in total serve approximately 264,000 electric connections and operate a fleet of generation assets with a net capacity of 1,424 MW.
>
> The Liberty Utilities Group's regulated natural gas distribution utility systems are located in the States of Georgia, Illinois, Iowa, Massachusetts, New Hampshire, and Missouri serving approximately 335,000 natural gas connections.
>
> The Liberty Utilities Group's regulated water distribution and wastewater collection utility systems are located in the States of Arizona, Arkansas, California, Illinois, Missouri, and Texas which together serve approximately 159,000 connections.

APUC announced on November 1, 2017, its execution of a joint venture in conjunction with its acquisition of a 25% equity interest in Altantica Yield PLC. APUC's September 30, 2017, Quarterly Report indicated the following details about the transaction and join venture:

> On November 1, 2017, APUC entered into an agreement to create a joint venture ("AAGES") with Seville, Spain-based Abengoa, S.A (MCE: ABG) ("Abengoa") to identify, develop, and construct clean energy and water infrastructure assets with a global focus. Concurrently with the creation of the AAGES joint venture, APUC entered into a definitive agreement to purchase from Abengoa a 25% equity interest in Atlantica Yield plc ("Atlantica") for a total purchase price of approximately U.S.

> $608 million, based on a price of U.S. $24.25 per ordinary share of Atlantica, plus a contingent payment of up to U.S. $0.60 per-share payable two years after closing, subject to certain conditions. The transaction is expected to close in the first quarter of 2018, subject to regulatory approvals and other closing conditions. No shareholder approvals are required.

APUC's September 30, 2017, Quarterly Report does not provide many details about its Liberty Midstates operations. This is not unique to Liberty Midstates because APUC owns numerous smaller regulated utility systems throughout the United States through its LUCo subsidiary. LUCo's acquisition of The Empire District Electric Company on January 1, 2017, approximately doubled the amount of regulated utility assets LUCo owns in the United States. Although there is very little information about Liberty Midstates in APUC's financial reports, Staff provided a description of Liberty Midstates in the Cost of Service report. Therefore, I will only discuss Liberty Midstates as it relates APUC's and LUCo's corporate financing strategy of its United States' regulated utility assets. This information will be useful for purposes of determining the appropriate capital structure for purposes of setting Liberty Midstates' allowed ROR.

APUC has a large and complex corporate structure, which it provided in response to Staff Data Request No. 2 (attached as Confidential Schedule 14). A brief review of this Schedule provides an appreciation for the numerous companies ultimately owned by APUC. While it is somewhat mind-boggling trying to digest this corporate structure, for purposes of evaluating APUC's capitalization and financing strategy, Staff will concentrate on the issues that are most relevant to setting a fair and reasonable ROR for Liberty Midstates using the most relevant capital structure. Staff's later discussion about credit rating agencies views of the financing strategies should also assist the Commission with evaluating the most relevant capital structure.

A further complicating factor to APUC's corporate and financing strategy is that both APUC's and Liberty Power's debt and preferred securities are issued in Canadian dollars and some of the costs of these securities are based on spreads over Canadian securities. That being said, I'll explain the various levels at which APUC and its subsidiaries raise debt capital. APUC is the only entity that issues equity to individual investors. APUC wholly-owns, either directly or indirectly, the equity of all of the down-stream subsidiaries.

APUC, LUCo and Liberty Power have their own credit facilities. Liberty Power issues its own debt directly, whereas LUCo receives its debt financing from the financing subsidiary LUF, which issues the debt directly to investors. LUCo guarantees all of the debt issued by LUF, which includes $395 million of debt that has been loaned to intermediate holding companies between LUCo and APUC for purposes of investing in LUCo's assets. Many of LUCo's debt issuances have been issued for purposes of funding its acquisitions of regulated utility companies in the United States. LUCo's acquisitions have included both asset acquisitions and company acquisitions. LUCo's acquisition of the Liberty Midstates system was an asset acquisition. In most asset acquisition transactions, no previously issued debt is assumed with the assets, which was the case for Liberty Midstates acquisition. LUCo assigned Liberty Midstates debt through affiliate promissory notes when it completed the acquisition, but it has not assigned Liberty Midstates any additional debt since it was acquired. In transactions that involve LUCo's acquisition of companies, these transactions often include the assumption of debt previously issued by the company or companies. For example, when LUCo acquired Empire, it assumed approximately $850 million of Empire's debt.

Regardless of whether LUCo acquired the regulated systems through an asset or entity transaction, APUC has indicated in investor presentations that it intends to primarily issue debt

through LUF on a going-forward basis for purposes of financing its US-based regulated utilities. Therefore, in Staff's opinion, the Commission should not consider the capital structure of any entity below LUCo for purposes of setting Liberty Midstates' allowed ROR. However, as Staff will explain in the capital structure subsection, it is important to consider entities between LUCo and APUC as well, which are shown on page 1 of Confidential Schedule 14.

F. APUC's, LUCo's and Midstates Credit Ratings

Credit Ratings

Liberty Midstates does not independently issue debt to investors. Therefore, it does not have a credit rating. APUC is rated by both S&P and DBRS—a Canadian-based rating agency. LUCo is indirectly rated by S&P and DBRS via its financing subsidiary, LUF. LUF is assigned the credit rating because it directly issues the debt on behalf of LUCo, but the rating is based on S&P's and DBRS' assessment of LUCo's credit profile because LUCo guarantees all of the debt issued by LUF.

S&P rates APUC's family of companies, which includes Liberty Power, based on APUC's consolidated credit profile. Consistent with this approach, all of APUC's companies' corporate credit ratings are the same, which is currently a 'BBB' rating. S&P's ratings on APUC are based on its assignment of a "strong" business risk profile and a "significant" financial risk profile. For comparison, most of Missouri's other major pure-play regulated utility companies are assigned a business risk profile of "excellent," which allows companies to issue more leverage and still have an equivalent credit rating. It is also common for S&P to at least provide its assessment of a "Stand Alone Credit Profile" ("SACP") for subsidiaries of holding companies if these subsidiaries issue debt directly to third-party investors. Although S&P does not rate any of Missouri's utility companies based on the SACP, it typically provides this information so

users are aware of the potential rating absent its affiliation with the holding company. Unfortunately, S&P does not assign a SACP for LUCo, but being that LUCo's operations are limited to regulated utilities throughout the United States, it is likely that the business risk profile would be similar to other regulated utilities, which is "excellent."

The following is an excerpt from a recent S&P report on APUC to provide the Commission with S&P's direct explanation of how they assess APUC's credit standing:

Business Risk: Strong

> APUC's strong consolidated business risk profile reflects S&P Global Ratings' opinion on the consolidated credit profiles of its two subsidiaries, Ontario-based independent power generator Algonquin Power Co. (APCO) and U.S.-based regulated utility Liberty Utilities Co. We project that Empire will contribute as much as 45% of APUC's total EBITDA and the regulated operations will contribute approximately 70% of total EBITDA. As a result, the acquisition leads to an improved assessment of industry risk to low from intermediate, without any impact to APUC's existing strong business risk profile.
>
> The strong business risk profile reflects the regulatory diversity through the company's holdings at Liberty; and the operating diversity through the water, gas, and electricity utility companies. The business risk profile also accounts for APUC's non-utility operations, which we view as having higher business risk than the regulated utility operations, although they are under long-term contracts. Long-term power purchase agreements support 85%-90% of the utility's EBITDA with a weighted average contract maturity of approximately 15 years, which bolsters the company's strong competitive position because of the inherent customer base stability.
>
> Further supporting the strong business risk profile is a large and diverse customer base across U.S. and Canada that, after acquisition, will be about 0.8 million customers, the majority of being residential and small commercial customers. In our view, this customer base is less volatile to economic changes and provides revenue and cash flow stability…

Group Influence

> We consider both Algonquin Power Co. and Liberty to be core, and our ratings on them are equivalent to the 'bbb' group credit profile.[11]

[11] Vinod Makkar and Stephen R. Golz, "Summary: Algonquin Power & Utilities Corp.," *S&P Global Ratings-RatingsDirect*, December 7, 2016.

Although S&P does not provide a SACP for LUCo, if S&P did assign LUCo an "excellent" BRP, then assuming LUCo had the same amount of financial risk as the APUC consolidated level, then it could have a rating of an 'A-.'

DBRS, which the Commission isn't familiar with other than through previous rate cases involving LUCo, such as Liberty Midstates last rate case in 2014, approaches the ratings it assigns to APUC and LUCo much the same way as Moody's. DBRS does give consideration to LUCo's stand-alone business risk and financial risk when it assigns LUCo's financing subsidiary, LUF, a credit rating of 'BBB (high)'.[12,13]

The following is an excerpt from the beginning of DBRS' ratings report on LUF in order to provide the Commission with DBRS' direct explanation of how it views LUF's credit rating:

> DBRS Limited (DBRS) confirmed the Issuer Rating and the rating of the Senior Notes of Liberty Utilities Finance GP1 (LUF or the Issuer). All the debt issued by LUF is unconditionally guaranteed by its related party, Liberty Utilities Co. (LUCo, the Company or the Guarantor). The Issuer and the Guarantor are wholly owned by Algonquin Power & Utilities Corp. (APUC). The proceeds from the debt issued by LUF to the public (Series A, B, C, D and E Senior Notes; collectively, the Senior Notes) are used to invest in the senior unsecured notes (related-party Notes) issued by LUCo. The Senior Notes and the related-party Notes contain the same terms and conditions.
>
> The confirmations reflect (1) good progress integrating Empire into LUCo's regulated utility system; (2) solid financial metrics in 9 months ending September 2017 (9M 2017), albeit weaker than 2016; and (3) reasonable rate case outcomes in 2017. The ratings incorporate the structural subordination of the Senior Notes to the debt at Empire. However, the structural subordination is significantly mitigated by LUCo owning other regulated assets that accounted for over 50% of LUCo's 2017 EBITDA (estimate) that have minimal debt. Following the Empire acquisition, LUCo's business risk profile improves significantly reflecting an increase in size, regulatory and operational diversification, particularly a significant increase in regulated electricity distribution assets, which

[12] Eric Eng and Adam Provencher, "Ratings Report – Liberty Utilities Finance GP1," *DBRS*, January 29, 2018.

[13] A 'BBB (high)' DBRS credit rating is equivalent to a Moody's 'Baa1' credit rating and an S&P 'BBB+' credit rating.

> accounted for over 60% of EBITDA in 2017 (25% in 2016). The customer base increases to approximately 758,000 (September 2017) from 565,000 at the end of 2016.
>
> The confirmations reflect the Company's solid credit ratios for 9M 2017. Due to a substantial amount of debt issued for the acquisition and the assumption of Empire's debt, the consolidated cash flow-to-debt and the EBIT-interest coverage ratios declined notably in 9M 2017 from the 2016 level but remained strong for the current ratings. The debt-to-capital ratio, excluding goodwill, increased significantly from the 2016 level, but remained in the BBB rating category. A positive rating action could be taken if the Company maintains the current cash flow and interest coverage ratios and lowers its adjusted consolidated debt-to-capital ratio to below 65% (adjusted for goodwill), as well as decreasing structural subordination. A negative rating action could be taken should the Company increase structural subordination and adjusted consolidated leverage to above 75% (adjusted for goodwill) on a sustained basis.[14]

A couple of points in the DBRS report are particularly useful for the Commission to consider when determining the most relevant capital structure for purposes of setting Liberty Midstates' allowed ROR. First, DBRS discusses two separate capitalization ratios as it relates to LUCo as of September 30, 2017, both an adjusted and an unadjusted debt/capital ratio. In both instances, DBRS includes the debt LUCo guarantees that has been loaned to intermediate holding companies between APUC and LUCo. Staff recommends the Commission include this debt in Liberty Midstates ratemaking capital structure because this debt capitalizes LUCo's assets. DBRS' adjusted debt/capital ratio of 65% debt excludes the goodwill asset from the equity LUCo assigns to its balance sheet. This provides the rating agency with insight as to the amount of leverage as a percentage of tangible assets which the company expects to be able to earn a return. While Staff does not recommend using this more leveraged capital structure to set Liberty Midstates' allowed ROR, this information shows that this metric is of concern to debt investors. It is clear that LUCo is targeting a more leveraged capital structure consistent with a

[14] Eric Eng and Adam Provencher, "Ratings Report – Liberty Utilities Finance GP1," DBRS, January 29, 2018.

'BBB' credit rating. Staff's capital structure recommendation is consistent with this corporate capitalization strategy.

G. Cost of Capital

In order to arrive at Staff's recommended ROR, Staff specifically examined (1) an appropriate ratemaking capital structure; (2) the Company's embedded cost of debt; and (3) whether current circumstances, both industry-wide and company-specific, justify a different allowed ROE for Liberty Midstates than Spire Missouri.

Capital Structure

Due to the complexity of APUC's corporate structure and financial management, the capital structure issue in this case is not straightforward. Staff has already explained the various different companies and operations owned by APUC. Although APUC is the only truly investable capital structure, it is not a pure-play regulated utility. Although APUC's non-regulated operations are still limited to independent generation projects owned by Liberty Power Company, these operations are still considered to be higher risk than traditional regulated utilities. Consequently, one would expect that APUC should typically have a less leveraged consolidated capital structure than LUCo, at least on average, over a period of time.

Because the capital structure is not straightforward in this case, Staff considered and examined several approaches before making its recommendation in this case. Staff analyzed the following approaches in order to arrive at its recommendation: (i) LUCo's per books capital structure as of September 30, 2017, (ii) LUCo's adjusted per books capital structure to account for debt at intermediate holding companies (which is also guaranteed by LUCo), (iii) APUC's per books consolidated capital structure as of September 30, 2017, (iv) a capital structure based on LUCo's targeted equity ratio, (v) Liberty Midstates internal capital structure and (vi) a

hypothetical capital structure based on Staff's proxy group. Staff will explain each option below, but because of the variability of APUC's and LUCo's actual capital structure in the last few months and also APUC's commitment to rating agencies to issue common equity to offset its business risk of its non-regulated operations, Staff recommends using LUCo's adjusted actual capital structure because this reflects the financial risk APUC has determined is reasonable for purposes of financing its regulated utility assets in the United States.

LUCo's per books capital structure:

Staff decided to use September 30, 2017 information rather than June 30, 2017 information because it is more likely to be similar to the capital structure as of the agreed-to updated period of December 31, 2017 when that information becomes available. LUCo's per books capital structure as of September 30, 2017 consisted of 48.93% common equity, 48.21% long-term debt, and 2.86% short-term debt. If short-term debt is excluded, the common equity and long-term debt ratio was 50.37% and 49.63%, respectively. This compares to LUCo's per books capital structure of 45.89% common equity and 54.11% long-term debt as of September 30, 2013, which was Staff's recommendation in Case No. GR-2014-0152, and was ultimately adopted by the Commission. As of September 30, 2013, there was no debt held in entities between LUCo and APUC for purposes of investment in LUCo and LUCo did not guarantee any debt held at any entities above it.

LUCo's adjusted per books capital structure:

Staff's examination of LUCo's notes to financial statements, rating agency reports and data request responses revealed that LUCo's per books balance sheet as of September 30, 2017, understates the amount of leverage used to support LUCo's investments.

On January 4, 2016, LUCo issued $235 million of debt through a term credit facility with two U.S. banks. This debt was transferred to Liberty Utilities (America) Holdco Inc. ("America Holdco") and was reclassified as an equity infusion into LUCo with LUCo still guaranteeing this debt. As of September 30, 2017, $135 million remained outstanding on this term facility. Consequently, Staff reduced LUCo's equity balance by the $135 million outstanding and increased the debt balance by the same amount.

On March 24, 2017, LUCo's financing subsidiary, Liberty Utilities Finance GP1 ("LUF"), issued $750 million of long-term debt. The proceeds from this debt issuance were used to provide affiliate loans to LUCo and America Holdco with LUCo guaranteeing all of the debt. LUCo only recorded $650 million of this debt on its books since the other $100 million was loaned to American Holdco to reduce the outstanding balance on the term credit facility to $135 million from $235 million. The full amount of the $750 million of debt issued on March 24, 2017 should be reflected in LUCo's capital structure.

On April 30, 2015 and July 15, 2015, LUF issued $90 million of debt and $70 million of debt, respectively, but this debt was not loaned directly to LUCo, even though LUCo still guarantees this debt. Apparently LUF loaned this debt to an intermediate holding company between APUC and LUCo and then this debt was infused as equity into LUCo.

When Staff accepted LUCo's unadjusted capital structure in the 2014 rate case, other than a revolving credit facility at the APUC level, there was no other holding company debt or intermediate holding company debt. APUC's financing strategy for LUCo has changed since the 2014 rate case, which is why it is no longer appropriate to accept LUCo's unadjusted per books capital structure as being representative of how LUCo's regulated utilities are actually

capitalized. DBRS also recognizes this debt in evaluating LUF's credit quality, which is based on its assessment of LUCo's financial risk.

After making the aforementioned adjustments to LUCo's capital structure, LUCo's September 30, 2017 was as follows: 39.25% common equity, 57.83% long-term debt and 2.92% short-term debt. If short-term debt is removed from the capital structure then the common equity ratio would be 40.43% with the remaining 59.57% being that of long-term debt.

APUC's per books capital structure:

APUC's capital structure is quite complex due to APUC's diverse operations, which includes its LUCo regulated electric, gas and water utility operations in the United States; its non-regulated independent generating assets both in Canada and the United States, which are owned by Liberty Power Company ("Liberty Power"), and as of November 2017, its US$608 million/25% equity interest in Altantica Yield PLC ("Atlantica"), which has power generating assets in South America, Africa and Europe. APUC intends to become active in the pursuit of additional generating investment opportunities throughout the world through its concurrent November 2017 executed joint-venture agreement (AAGES) with Abengoa S.A., which has a 41% interest in Atlantica. On November 10, 2017 APUC issued C$576 million (approximately US$461.5 million) in common stock to partially fund the acquisition of the Atlantica investment.

APUC, LUCo and Liberty Power have their own credit facilities. LUCo and Liberty Power issue their own long-term debt. APUC has typically had a limited amount of holding company debt with the exception of some draws on its credit facilities. As of September 30, 2017, approximately 14% of APUC's long-term capital was preferred stock and non-controlling minority interests. APUC's preferred stock and credit facilities are denominated in Canadian dollars; Liberty Power's credit facility and debt are denominated in Canadian dollars; LUCo's

credit facility and debt are denominated in US dollars. Although Canadian and US fixed income markets are tightly correlated in terms of changes in interest rates, there can be differences in the level of interest rates. For example, over the last three months, 10-year Canadian government notes have traded at an average yield that is 43 basis points lower than 10-year US Treasury notes. Consequently, although Staff thinks it is reasonable to consider the amount of leverage included in APUC's capital structure to determine the reasonableness of an authorized equity ratio for Liberty Midstates since it is owned by APUC through LUCo, Staff does not recommend adopting APUC's specific capital structure and associated capital costs for purposes of setting the allowed ROR for Liberty Midstates' Missouri assets.

Although Staff does not recommend the adoption of APUC's capital structure and capital costs for purposes of setting Liberty Midstates ROR, it's still useful to compare its capital structure to LUCo's as of September 30, 2017. Schedule 6-1 shows APUC's capital structure. If preferred stock is netted out of equity, then APUC had 41.74% common equity (includes non-controlling tax equity interests), 2.89% preferred stock, 48.69% long-term debt and 6.68% short-term debt.

In an investor presentation APUC made to investors on November 16, 2017, APUC provided a pro forma estimate of the impact of APUC's common equity issuance on November 10, 2017, on APUC's capital structure. According to these pro forma adjustments, APUC's September 30, 2017 capital structure would have had 49.1% common equity, 48.2% long-term debt and 2.7% preferred stock.

LUCo's target capital structure:

In September 2017, LUCo and Liberty Power provided presentations to their fixed-income investors. In these presentations, LUCo indicated that it targets a long-term debt to

total capital ratio in the range of ** _____ **. In the same presentation, LUCo indicated that APUC's targets a long-term debt ratio in the range of ** _____ **. In a separate presentation, Liberty Power indicated that it targets a long-term debt ratio of ** _____ **. These target capital structures are consistent with the fundamental principles of the interaction of business and financial risk. LUCo has the lowest business risk of all three entities because it only owns price-regulated monopoly utilities throughout the United States. Therefore, its assets can support more leverage than the rest of APUC's assets and still carry a stable investment-grade credit rating. Liberty Power owns independent power projects, which are not protected by price-regulation. Therefore, its riskier assets (i.e. business risk) need to be offset with less leverage (i.e. financial risk). When APUC consolidates LUCo and Liberty Power at the holding company level, to the extent APUC is not carrying additional leverage at the holding company level, the ratios of its leverage would naturally fall in the middle of LUCo's and Liberty Power's leverage. Until recently, LUCo's consolidated balance sheet had captured the full amount of debt in its capital structure, but as Staff discussed earlier, APUC has moved this debt to an intermediate parent company. LUCo's September 2017 fixed-income presentation accurately portrayed the amount of debt supporting LUCo's assets when it provided a pie chart that shows that LUCo had an approximate ** ___ ** equity ratio as of June 30, 2017.[15]

Consequently, APUC's representations to investors that its regulated utility operations have more debt capacity are borne out in its adjusted actual capitalization. In recent periods, APUC has been using more leverage for its investment in LUCo's assets than it typically targets.

[15] Liberty Utilities Fixed Income Presentation, September 2017, p. 12.

Liberty Midstates internal capital structure

Liberty Midstates capital structure is a function of affiliate loan transactions executed when LUCo acquired the gas system from Atmos Energy in 2012. The capital structure LUCo assigned to Liberty Midstates was based on the mix of capital it claims was used to fund the acquisition. Liberty Midstates sponsored this capital structure in its last rate case and maintained it consisted of 55% equity and 45% debt. While Liberty Midstates is not recommending the Commission use a Liberty Midstates capital structure for purposes of this case, Staff still reviewed it for informational purposes. Liberty Midstates filed a financing application on October 3, 2017, Case No. GF-2018-0091, in order to request Commission authority to "refinance" one of the affiliate loans that had already matured on July 31, 2017. Being that this was an affiliate promissory note, there was no default to a third-party. The terms of the original underlying ** _____ ** of affiliate debt was based on ** _____ **of third-party debt LUCo's finance subsidiary, LUF, had issued in 2012. Because LUF did not issue new long-term debt to refinance the ** _____ ** that was retired by LUCo on July 31, 2017, LUCo assigned a term and cost to the affiliate loan based on internal estimates. Consequently, these internal financing agreements are not a function of third-party investors' pricing of the risk of Liberty Midstates. Therefore, it is still inappropriate to use the internal assigned capital structure and assigned capital costs for purposes of setting Liberty Midstates allowed ROR.

Hypothetical based on average of proxy group capital structures:

A final approach Staff considered was using the average capital structures of its chosen proxy group. This is the approach the Company ROR witness recommends in his direct testimony. The intuitively appealing aspect of this approach is that to the extent the proxy group is confined to "pure-play" local natural gas distribution utility companies, the capitalization of

these companies should be consistent with the needs and business risks of local natural gas distribution assets. For example, access to liquidity through the short-term debt markets is an important priority for gas distribution companies because they typically need to purchase physical gas inventory and/or secure commitments for gas supply before the winter heating months. Access to short-term debt is important for a pure-play gas utility because it does not have liquidity produced by other utility operations, such as electric utility assets, that would minimize the need to issue short-term debt. In fact, evidence of the priority most pure-play gas utility companies put on being able to access short-term debt by issuing commercial paper is the fact that gas utility companies typically have stronger average credit ratings than those carried by pure-play electric utility companies.

The biggest weakness of using a hypothetical approach is that it does not recognize the actual strategic corporate financing structure in which the assets are funded. Additionally, authorizing a capital structure that does not reflect the corporation's actual financing strategy removes the corporation's incentive to be more conservative in how it finances its assets. If a company has an aggressive financial strategy to use more leverage to capitalize its assets, but this leverage is not recognized in the ROR allowed the company, then the company is incentivized to take on additional leverage to attempt to maximize the spread between their authorized ROR and their actual cost of capital. While it is certainly understandable that the company would seek to maximize shareholder value, if the financial flexibility of the utility is compromised by such actions, then this may impair the ability of the company to continue to make necessary investments in the utility assets.

For the foregoing reasons, Staff does not recommend the use of a hypothetical capital structure based on the average capital structures of the proxy group.

H. Cost of Debt

I recommend the Commission match LUCo's consolidated embedded cost of debt to that of LUCo's adjusted capital structure. LUCo's consolidated embedded cost of long-term debt was 4.51% as of September 30, 2017. In comparison, Spire Missouri's embedded cost of debt was approximately 4.12%.

I. Cost of Common Equity

I estimated Liberty Midstates' COE by applying COE methodologies to a proxy group that consists of companies whose operations are predominantly regulated gas distribution, which was the same proxy group I used in the recent Spire Missouri rate cases. While utility capital markets have tightened since the Commission determined an allowed ROE of 9.8% was reasonable in the Spire Missouri rate cases, considering that even with this tightening, there is still a sizable spread between the COE and allowed ROE, Staff does not recommend an increase to this baseline due to capital market changes. However, Staff does recommend a 20 basis point increase to the 9.8% baseline, which Staff will explain after describing its COE analyses.

a. The Proxy Groups

I selected my initial population of natural gas utility companies by downloading companies classified as gas utility companies by S&P Market Intelligence ("MI"). Starting with the twelve market-traded companies MI classifies as natural gas utility companies, I applied a number of criteria to develop a proxy group comparable in risk to Liberty Midstates' regulated gas utility operations (*see* Schedule 7). My criteria are designed to capture companies whose operations are predominately regulated gas utility operations, are financially stable, are not a target of an acquisition and are followed by equity analysts. The criteria I selected accomplished this objective. However, I note that even with my screening criteria, some of the companies I

chose for my proxy group have business segments other than rate-regulated utility operations that cause volatility in the contribution of the regulated utility operations to the percentage of income on a year-to-year basis. My criteria are as follows:

1. Classified as a natural gas utility by MI (12 companies);
2. Publicly-traded stock (no companies eliminated, 12 remaining);
3. At least 80% of assets attributed to regulated utility operations (4 companies eliminated, 8 remaining);
4. At least 80% of income from regulated utility operations (0 companies eliminated, 8 remaining);
5. No reduced dividend since 2014 (0 companies eliminated, 8 remaining);
6. At least investment grade credit rating (2 companies eliminated, 6 remaining);
7. Current long-term growth projections available from at least one equity analyst (0 companies eliminated, 6 remaining);
8. Not an acquisition/merger target (1 company eliminated, 5 remaining).

I used this final group of 5 publicly-traded natural gas utility companies ("the comparables") as the proxy group to estimate a cost of common equity for the natural gas utility industry. This is the same set of companies Staff used in the recent Spire Missouri rate cases. These companies are shown on Schedule 8.

The composition of my proxy group in these cases compared to the 2014 rate case has changed for a number of reasons, with the main one being that of completed mergers/acquisitions or pending mergers/acquisitions. Southern Company acquired AGL Resources on July 1, 2016. Duke Energy Corporation acquired Piedmont Natural Gas Company on October 3, 2016. AltaGas, Ltd. announced on January 25, 2017, its intent to acquire WGL Holdings, Inc. Staff had included New Jersey Resources Corporation ("NJR") in the 2014 rate

case because Staff used a lower threshold for percentage of assets and income (65%) from distribution operations compared to an 80% threshold in this case. Although South Jersey Industries ("SJI") was excluded from the 2014 proxy group, this was not due to the criteria related to income and assets as it was in this case. SJI would be included in the proxy group if Staff were to revert back to its less stringent criteria. My proxy group now includes ONE Gas, Inc., which is a 100% pure-play gas distribution company that was spun-off from ONEOK, Inc. on February 3, 2014.

Of the five companies Staff selected for its proxy group, only two of the companies are truly pure-play gas distribution companies, Northwest Natural Gas Company and ONE Gas. Atmos' operations are mainly confined to regulated gas utility operations, but parts of its operations are classified as natural gas pipelines. Spire, Inc.'s operations are also predominately gas distribution operations, but it still has its energy marketing company, Spire Marketing, which contributes less than 5% to Spire, Inc.'s income. The compositions of each company's operations are important to consider when interpreting the implied COE estimates from the proxy group.

b. The Constant-growth DCF

I estimated Liberty Midstates' COE by applying values derived from the proxy groups to the constant-growth DCF model. The constant-growth DCF model is widely used by investors to evaluate stable-growth investment opportunities, such as regulated utility companies. The constant-growth version of the model is usually considered appropriate for mature industries such as the regulated utility industry.[16] It may be expressed algebraically as follows:

[16] Aswath Damodaran, *Investment Valuation: Tools and techniques for determining the value of any asset,* University Edition, John Wiley & Sons, Inc., 1996, pp. 195-196; John D. Stowe, Thomas R. Robinson, Jerald E. Pinto and Dennis W. McLeavey, *Analysis of Equity Investments: Valuation*, Association for Investment Management and Research, 2002, p. 64.

$$k = D_1/P_0 + g$$

Where:

k is the cost of equity;

D_1 is the expected next 12 months dividend;

P_0 is the current price of the stock; and

g is the dividend growth rate.

The term D1/P0, the expected next 12-months' dividend divided by current share price, is the dividend yield. I calculated the dividend yield for each of the comparable companies by dividing the consensus analysts' expected dividend per share for the next four quarters (*see* Schedule 11) by the average daily closing stock prices for the three months ending January 31, 2018 (*see* Schedule 11).[17] I used a recent average of the stock prices because it reflects current market expectations, but still ensures daily swings in market prices do not skew the implied COE too high or low. The projected average dividend yield for the proxy group of five comparable companies is approximately 2.70%, which is equivalent to the dividend yield for the same five companies in the Spire Missouri rate cases. However, the dividend yield had been trending up as of the time Staff did its analysis for this case. If Staff had used just the last two months of stock prices, then the implied dividend yield was approximately 2.75%.

1. The Inputs

In the DCF method, the cost of equity is the sum of the dividend yield and a perpetual growth rate ("g") that is intended to replicate the projected capital appreciation of the stock. In estimating a growth rate, I considered the actual dividends per share ("DPS"), earnings per share ("EPS") and book value per share ("BVPS") for each of the comparable companies over

[17] The averaging technique minimizes the effects of short-term stock market volatility on the calculation of dividend yield. P0 is calculated by calculating the average of daily closing prices over the selected period.

the past five and ten years, as well as projected DPS, EPS and BVPS in the next three years (*see* Schedules 10-1 through 10-4). I also reviewed equity analysts' consensus estimates for long-term compound annual growth rates ("CAGR") in EPS as reported by S&P Capital IQ ("CIQ") and provided by MI. According to CIQ, equity analysts' consensus estimates of 5-year CAGR in EPS for the proxy group averaged 4.98% (*see* Schedule 10-4). In the Spire Missouri rate cases, the consensus long-term CAGR in EPS was 5.19%, implying that equity analysts are currently not projecting an increase in growth for gas utilities due to potential increased economic growth and/or tax reform.

Based on the projected EPS growth rate data, one may argue that gas utilities can grow at a constant rate of approximately 5 percent, but this assumption would ignore the empirical and logical information that suggests that utility companies should grow at a rate less than that of the overall economy due to the mere fact that investors invest in utility companies for yield and not growth. In fact, considering that companies in the S&P 500 in recent years have retained approximately 65% of their earnings for reinvestment,[18] while natural gas utilities' retention ratio has been approximately 35% over the same period, it follows that utilities will grow at a rate less than that of nominal GDP growth. Consequently, a projected long-term, steady-state nominal GDP growth rate[19] should be considered as an upper constraint when testing the reasonableness of growth rates used to estimate the cost of equity for a regulated gas utility. Most economists do not project nominal GDP to grow much higher than 4.5% per year over the long-term,[20] so

[18] http://www.wyattresearch.com/article/dividend-payout-ratio.

[19] The nominal GDP growth rate, contrasted to the real GDP growth rate introduced earlier, is not adjusted for inflation.

[20] The CBO projects an annual compound growth rate in nominal GDP of approximately 4.0% through 2027. EIA's reference case projects an annual compound growth rate in nominal GDP of approximately 4.35% for the period 2014 through 2040. The Survey of Professional Forecasters projects a 10-year annual compound growth rate in real GDP of 2.45%. The Livingston Survey for June 2017 projects an average annual compound growth rate in real GDP of 2.20% over the next ten years; and the FOMC projects a central tendency long-term real GDP growth of

serious doubt must attach to a constant growth rate for the gas utility industry that is above the upper constraint. While there is no question that many gas utilities are ramping up their capital expenditures for various gas line replacement programs, these replacements have finite periods associated with them. For example, Spire Missouri indicated that it expected to complete its gas line replacements within the next 15 years. After these replacement programs are complete, it is not clear what will drive the growth of the gas distribution business, especially in mature service territories. Therefore, the maximum amount of growth in investment would be the increased cost to replace infrastructure at the end of its useful life. This would translate into a growth rate consistent with any inflationary cost in materials and labor to replace the existing infrastructure.

Because the constant-growth DCF is based on the premise that dividends will grow at the same constant growth rate forever into the future, it is prudent to analyze actual realized growth for an industry/company over a very long period. I have access to gas utility industry data dating back to at least 1968. Considering the period 1968-2016 covers almost a 50-year period, this is a robust amount of data to analyze to determine a long-term industry growth rate for the gas utility industry. Because this period includes a time in which the U.S. economy experienced healthy GDP growth and healthy market returns, the growth over this period is more consistent with a "best case" scenario for growth.

In order to evaluate the gas industry's growth compared to GDP growth, I had to select a group of natural gas distribution companies that could be considered a good proxy for the natural gas distribution industry for a long, continuous period. I started with the entire set of companies that Edward Jones had typically classified as natural gas distribution companies in its past

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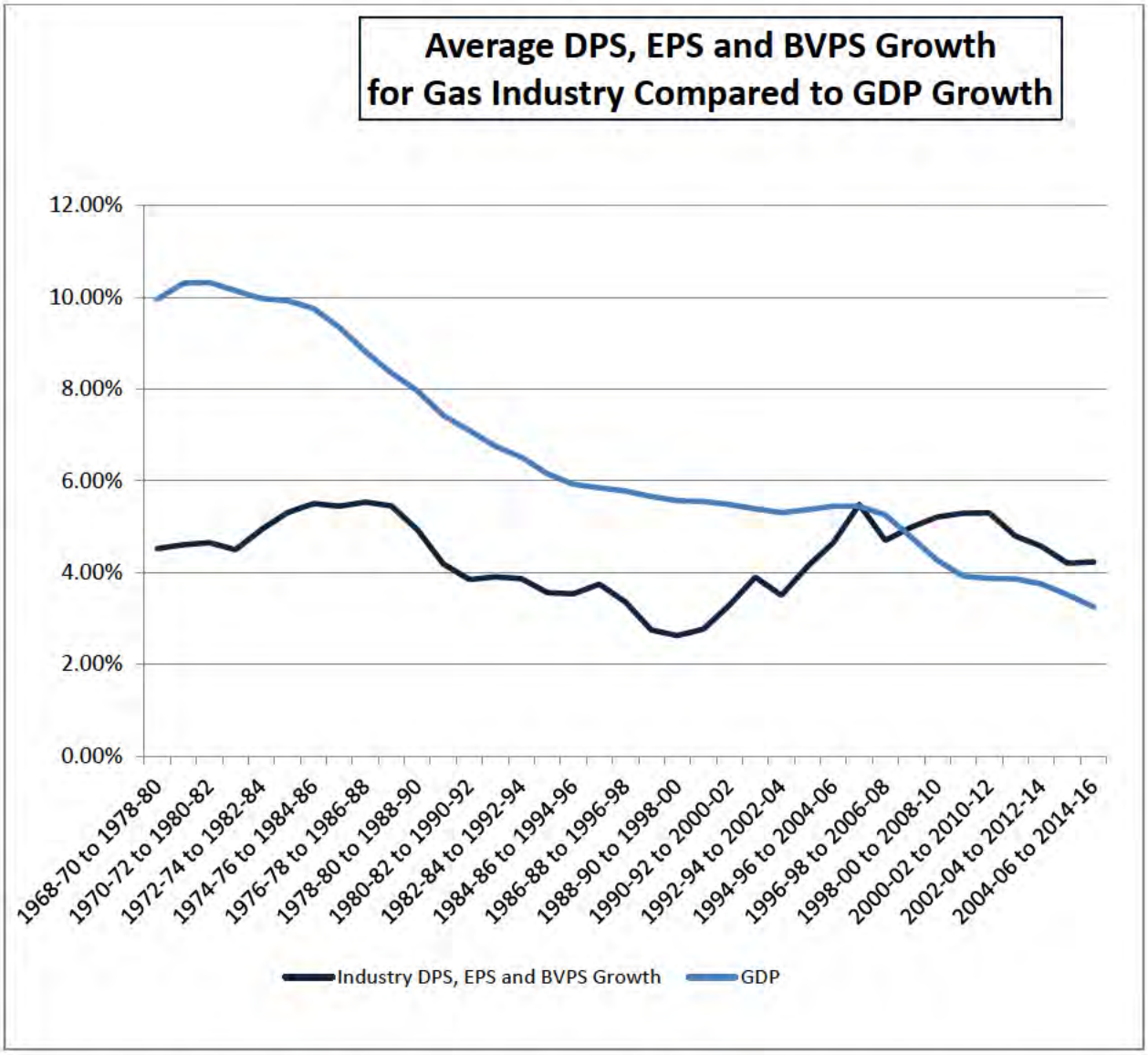
only 1.8% to 2.0%. In each case in which the sources do not project a nominal GDP growth rate, Staff recommends adding a GDP price deflator of 2.0%, which is the CBO's approximate prediction of long-term inflation and also the inflation rate which is targeted by the Federal Reserve. Based on these projections, the long-term nominal GDP growth rate is expected to be approximately in the range of 3.84% to 4.35%.

quarterly publications on the natural gas industry. Because this exercise is for purpose of evaluating empirical evidence on the actual growth rates of the local natural gas utility industry, it is not necessary to pick companies that still trade as public companies. I then researched Staff's library of Value Line Ratings & Reports to determine which of these companies had continuous historical financial data for at least 20 years. The following companies had at least 20 years of continuous financial data: AGL Resources (now Southern Company Gas), Atmos Energy, Laclede Group (now Spire, Inc.), New Jersey Resources, Northwest Natural Gas, Piedmont Natural Gas (now owned by Duke Energy Corporation), South Jersey Industries and WGL Holdings. Actually, all of these companies, with the exception of Atmos Energy, had continuous financial data in the Staff's library going back until at least the early 1970s, with most companies having information covering the entire historical period (back to 1968) in which Staff has information available in its library. I still included Atmos in my long-term proxy group, but I also analyzed trends without Atmos because it had less continuous financial data dating back to the early 1970s. Although I did not include New Jersey and South Jersey in my proxy group to evaluate current market data, this does not render these companies irrelevant for purposes of evaluating long-term growth rate trends in the natural gas utility industry. In fact, these companies only recently started to grow their non-regulated operations to the point where the risks are not consistent with a pure-play regulated gas distribution utility.

My analysis of the proxy group's financial data since 1968 revealed that the actual realized growth of the natural gas distribution industry has averaged in the 4% to 4.5% range, or about 66% of average GDP growth of around 6.5% over the same period. Although the natural gas distribution industry grew at a slower rate than GDP, I believe it is also important to consider that the growth in the natural gas distribution industry was not highly correlated with GDP

growth over this period. Below is a graph of the natural gas distribution industries' average 10-year compound growth rates as they compare to GDP growth for the period 1968 through 2016 (this graph and the supporting data are also contained in Schedules 10-5 through 10-8):



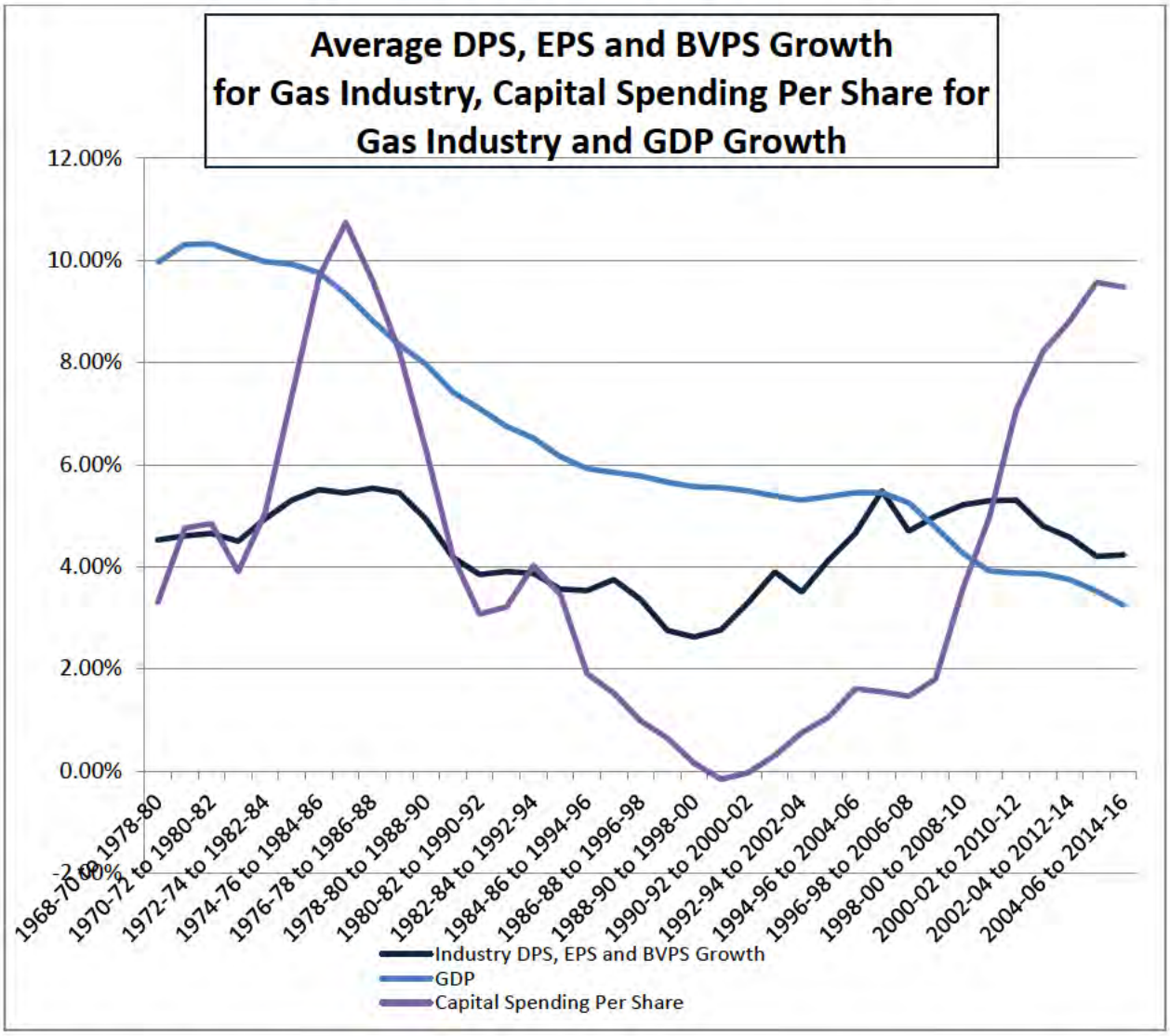
As can be seen in the above graph, the growth for the natural gas distribution industry moved inversely to that of GDP for the 10-year periods from 1970 - 1980 through the mid-70s to the mid-80s. After the mid-70's, during the 10-year periods through 1990-2000 the gas industry generally had declining growth rates along with GDP. However, the 10-year periods ending

after the turn of the century has shown that the gas industry has increased while GDP decreased, with growth rates exceeding GDP growth shortly after the financial crisis in 2008 and 2009. Consequently, empirical evidence shows that natural gas distribution utility growth has had very little correlation to that of GDP. In this case, a key question for purposes of understanding the reasonableness of constant growth rates used in a DCF analysis is how one should incorporate GDP into evaluating the reasonableness of gas industry growth rates and what are the major factor(s) that will determine the sustainability of gas industry growth rates going forward?

As I have already explained, even though natural gas distribution industry growth has not been highly correlated to GDP in terms of growth patterns, it has typically been less than GDP growth until recently. Therefore, at least in the long-term, GDP should act as a constraint on potential growth on the utility industry. It is irrational to conclude the gas utility industry will become a driver of economic growth rather than a follower of economic growth, especially given the fact that energy consumption has been declining.

The other factors that often determine potential growth for the regulated gas distribution industry are investment and demand/customer growth. Because most regulated natural gas distribution companies have moved to largely decoupled rate designs in which the recovery of the revenue requirement is not a function of usage, but number of customers, the other major factor should be limited to expansion of the system to serve additional customers. My understanding of the history of the natural gas distribution industry, at least that of the proxy group I analyzed, is that customer growth was a key driver of capital investment in the 1980s. In order to understand the relative magnitude of the capital investment natural gas distribution companies made in the 1980s, I also analyzed the changes in capital spending per share from the

period 1968 through the present. I then compared the industry's capital spending to the average growth in DPS, EPS and BVPS and found a high correlation between the two.



As can be seen, there is a higher correlation between capital spending and industry growth then there is between GDP and industry growth. One would expect capital expenditures to be fairly highly correlated to GDP growth, but this has not been the case for the gas distribution industry. The current rise in capital expenditures is not driven by expected growth in the economy, but in the perceived need to accelerate capital expenditures for infrastructure

replacement. Of course, capital expenditure growth would typically cause a direct increase in book value per share growth and earnings growth, but because the U.S. Government has been allowing bonus depreciation rates in order to incentivize capital investment to stimulate the economy, these higher income tax deprecation rates have been an offset to the company's ability to increase the book value of its assets. Therefore, the higher growth rate in capital expenditures will not cause earnings to grow at the same rate.

Consequently, growth of earnings and dividends should primarily be a function of a growth in book value, which is the fundamental premise underlying the retention growth method, which is that growth in earnings is driven by the expected ROE multiplied by the earnings retained for reinvestment, that is, the growth in book value. Of course, only so much capital expenditure can be accelerated due to tax incentives before there is no longer a need for additional investment. This is the point at which growth in investment would revert to a maintenance growth rate. Although many gas companies were already targeting bare steel and cast iron gas lines for replacement before bonus depreciation was instituted, this tax incentive has provided gas companies with incentive to accelerate these replacements even quicker than initially planned. The additional cash flow available from not having to pay income taxes has allowed gas companies to reinvest without having to issue common equity, which would be dilutive to existing shareholders.

My understanding of the investment growth in the natural gas distribution industry is that many companies have been and continue to pursue replacement of existing infrastructure in accordance with various infrastructure replacement programs and favorable rate treatment

associated with these programs.[21] To the extent there is limited customer growth, this will be the primary driver of growth for the gas distribution industry.

Because investors are well aware of the limitations on potential growth for the industry as compared to its historical growth, as Staff discussed above, Staff believes it is important to consider the natural gas distribution industry's actual experienced growth over the long-term, when judging whether an assumed growth rate is sustainable at a constant rate forever into the future. Equity analysts project a compound annual growth rate in earnings per share over the next five years of approximately 5%. However, based on actual historical growth over the long-term, this growth rate is not sustainable over a longer period, let alone for infinity as assumed in the constant-growth DCF.

Schedule 10-5 shows rolling average 10-year compound growth rates for EPS, DPS, and BVPS for a proxy of the natural gas distribution industry. I calculated the historical compound growth rates consistent with Value Line's methodology, which uses a 3-year average for the beginning period and a 3-year average for the ending period. For example, even though the data I analyzed dates back to 1968, the 10-year compound growth rate is based on the 3-year average of per share data for the period 1968-1970 and 1978-1980. The average rolling 10-year

[21] Atmos operates in Kansas, Kentucky, Mississippi, Tennessee, Texas, and Virginia. In Colorado, Atmos receives a System Safety and Integrity Rider (SSIR). The SSIR is implanted for a three year term to December 31, 2018, and then the company can ask for an extension in a future filing. In Kansas, Atmos receives a Gas System Reliability Surcharge (GSRS) between .5% and 10% of revenues to recover new replacement costs. In Kentucky in 2015, the Pipeline Replacement Program (PRP) surcharge was implemented for to replace aging infrastructure. On September 08, 2015, in Mississippi, Atmos was approved for a *Stipulation and Agreement* to establish a long-term plan to hold a review of spending over the next 10 years and the projected rate impact. In 2015, Tennessee approved Atmos to use an Annual Review Mechanism to allow the company to adjust rates to replace infrastructure. In 2003, Texas approved the Gas Reliability Infrastructure Program (GRIP). It allows Atmos to recover investment changes within two years of a rate case to replace infrastructure. In 2010, Virginia approved of a Steps To Advance Virginia's Energy Plan (SAVE) program. It allows for a separate rider to recover return on specific investments. (Office of Energy Policy, 2017). In Kansas, One Gas implemented a GSRS to provide recovery on infrastructure investments. In Texas, they utilize the GRIP mechanism which includes 86% of their customers. Taxes, depreciation, and a return on investment are allowed. The Safety-Related Plant Replacements to defer interest cost, taxes, and depreciation expense on safety-related plant replacements. (One Gas 10-K, 2016). In June 2014, California approved Southwest Gas to institute the Infrastructure Reliability and Replacement Adjustment Mechanism (IRRAM). In January 2014, Nevada approved accelerated recovery of costs with replacing pipelines.

compound annual growth rate in earnings per share for the period Staff analyzed was 4.40% for EPS; the rolling 10-year compound DPS growth rate was 4.20%; the rolling 10-year compound BVPS growth rate was 4.59%; and the overall average for DPS, EPS and BVPS was 4.40% (*see* Schedule 10-5).

Because the gas distribution industry only achieved growth in the low 4.2% to 4.6% during a period of high capital investment and higher average economic growth of 6.54%, a constant-growth rate closer to 4% is more logical considering projected growth rates for the U.S. economy are much lower in the future as compared to the period I analyzed. In order to give some consideration to some of the higher near-term expected growth rates, especially in DPS rather than EPS, I will use a growth rate range of 4.2% to 5.0%. This results in a cost of equity estimate of 6.90% to 7.70%. While I understand that my COE estimate is much lower than the average allowed ROEs for gas utility companies in the country, it is quite consistent, if not on the high side, compared to COE estimates used by equity analysts that follow APUC. Being that APUC has more business risk than LUCo's regulated utility operations, the cost of equity assigned to APUC is higher than what would be appropriate for LUCo's regulated utility assets, including Liberty Midstates.

J. Tests of Reasonableness

I have tested the reasonableness of my DCF results, both by use of a CAPM analysis and consideration of other evidence.

The CAPM

The CAPM is built on the premise that the variance in returns is the appropriate measure of risk, but only the non-diversifiable variance ("systematic risk") is rewarded. Systematic risks, also called market risks, are unanticipated events that affect almost all assets to some degree

because the effects are economy wide. Systematic risk in an asset, relative to the average, is measured by the beta of that asset. Unsystematic risks, also called asset-specific risks, are unanticipated events that affect single assets or small groups of assets. Because unsystematic risks can be freely eliminated by diversification, the reward for bearing risk depends on the level of systematic risk. The CAPM shows that the expected return for a particular asset depends on the pure time-value of money (measured by the risk free rate), the reward for bearing systematic risk (measured by the market risk premium), and the amount of systematic risk (measured by beta). The general form of the CAPM is as follows:

$$k = Rf + \beta\ (\ Rm - Rf\ )$$

Where:

k	is the expected return on equity for a security;
Rf	is the risk-free rate;
β	is beta; and
Rm - Rf	is the market risk premium.

For inputs, I relied on historical capital market return information through the end of 2016. I will update the information through 2017 as soon as Staff receives the updated market information. Although the broader markets have exhibited significant volatility in recent weeks, this information will not be captured by the earned returns through 2017. However, because the markets did well in 2017, it is likely that the spread between stock and bond returns has expanded, implying a higher equity risk premium. For the risk-free rate ("Rf"), Staff used the average yield on 30-year U.S. Treasury bonds for the three-month period ending January 31, 2018; that figure was 2.82%. For beta ("β"), I relied on estimates directly calculated through

an Excel spreadsheet designed specifically to be used with the MI database of market and financial information.[22]

The average beta for the proxy group was 0.69 as compared to 0.71 in the Spire Missouri rate case. For the market risk premium (Rm – Rf) estimates, I relied on the historical difference between earned returns on stocks and earned returns on bonds.[23] The first risk premium was based on the long-term arithmetic average of historical return differences from 1926-2016 (6.00%). The second risk premium was based on the long-term geometric average of historical return differences from 1926 to 2016 (4.50%). The results using the long-term arithmetic average risk premium and the long-term geometric risk premium are 6.91% and 5.89%, respectively. This compares to CAPM results for arithmetic and geometric averages of 7.14% and 6.08%, respectively in the recent Spire Missouri rate cases. Although this implies a decline in utilities' COE, Staff used the same equity risk premium as in the last case. Considering the recent volatility in broader markets since the end of January, the equity risk premium has increased. The fact that the betas declined since Staff did its analysis for the Spire Missouri case supports that the broader markets volatility has increased as it relates to utility stocks.

These cost of common equity results support the reasonableness of my cost of equity estimates derived from my DCF analysis. I again note that both U.S. Treasury yields and utility

[22] Although I am no longer using Value Line's published betas for purposes of my CAPM analysis in my direct testimony, because Value Line is used by many retail investors, I still believe Value Line's beta calculation methodology should be considered when performing a CAPM analysis. Because estimating beta is a matter of having access to financial data and performing statistical calculations, unless a financial services provider has a proprietary adjustment they make to their beta calculation, understanding the methodology used by a financial provider allows an analyst to approximately replicate betas of that provider. Fortunately, this is the case for Value Line's beta calculation methodology. Consistent with Value Line's approach to calculating beta, I used 5-years of historical weekly returns of the subject company and the New York Stock Exchange ("NYSE") index. The covariance of the weekly returns on the NYSE index and the weekly returns on the subject company is divided by the variance of the weekly returns on the NYSE index to determine raw beta (unadjusted beta). I then adjusted the raw beta using the Blume adjustment formula as used by Value Line: Adjusted Beta = (.35 + .67(Unadjusted Beta)) (*see* Schedule 11).

[23] From Duff & Phelps *2016 Valuation Handbook: A Guide to the Cost of Capital.*

bond yields are quite low (at levels last experienced in the early 1960s) and that the spread between them is presently below their long-term average. Consequently, it is rational and reasonable for investors to require and expect returns on common equity in the 6 percent range for utility stocks.

Other Tests

The "Rule of Thumb"

A "rule of thumb" method allows an objective test of individual analysts' cost of equity estimates. Because this method is suggested in a textbook[24]used for the curriculum for Chartered Financial Analyst ("CFA") Program, I believe this method is free of any bias from those involved in utility ratemaking. It is also a useful test because it is very straightforward and limits the risk premium to a 200-basis point range. The cost of equity is estimated by simply adding a risk premium to the YTM of the subject company's long-term debt. Based on experience in the U.S. markets, the typical risk premium is in the 3% to 5% range. Considering that this is based on general U.S. capital-market experience and that regulated utilities are on the low end of the risk spectrum of the general U.S. market, a risk premium closer to 3% is more probable. This is especially true considering that regulated utility stocks behave like bonds. For the three months ended through January 2018, Moody's "A" rated and "Baa" rated long-term public utility bonds had average yields of 3.83% and 4.16% respectively.[25] Adding a 3% risk premium, the "rule of thumb" indicates a cost of common equity between 6.83% and 7.16%. Adding a 5% risk premium, the "rule of thumb" indicates a cost of common equity between 8.83% and 9.16%.

[24] Courtois, Y., Drake, P., & Lai, G. (2007), *Cost of Capital*. Reading 36, Corporate Finance and Portfolio Management, CFA Program Curriculum, 2017, Level I, Volume 4.

[25] August 2017 Mergent Bond Record.

Average Authorized Returns

In the past, the Commission has applied a test of reasonableness using average authorized returns published by Regulatory Research Associates ("RRA") to test the reasonableness of its allowed ROE. According to RRA, the average authorized return on equity for gas utilities for 2017 was 9.72% (based on 24 ROE determinations), compared to 2016's calendar year average of 9.54% (based on 26 ROE determinations).[26] Because the average ROEs for gas utilities in 2017 contained a few outliers (most notably an allowed ROE of 11.88% on the high side and 8.70% on the low side), it is important to observe the median allowed ROE for 2017 was 9.6%.

As a further refinement, Staff also evaluated allowed ROE information for only cases that were fully-litigated because in these cases, one would expect that each issue is determined based on its own merits. Allowed returns determined in the context of a settled case are not as reliable because parties make adjustments to other elements of the ratemaking formula in order to arrive at an overall reasonable number. It has been my experience that some companies do not want a lower ROE published in a settlement because this is a "headline" number. Consequently, companies may compromise on a more obscure area of the rate case in order to have a higher ROE published in the settlement. The average allowed ROE for fully-litigated cases for 2017 was 9.89% (7 decisions). Allowed ROEs for fully-litigated cases were 9.61% for the 2016 calendar year.

K. Company-Specific Adjustment

Although the Commission authorized Spire Missouri a 9.8% allowed ROE, this was specific to Spire Missouri's risk profile. Spire Missouri's stand-alone credit profile ("SACP) is consistent with an 'A' rating as specified by S&P if it were to rate Spire Missouri based purely

[26] RRA Regulatory Focus – Data was included in a study entitled Major Rate Case Decisions – January – June 2017.

on its business and financial risk.[27] Liberty Midstates does not issue its own debt and it is not rated. Therefore, there is no rating agency assessment as to what its SACP may be. In such situations, it is best to evaluate the SACP of the subsidiary that is responsible for the debt financing for the utility operations. In this case, that company is LUCo. LUCo has a SACP of 'BBB' (high) as specified by DBRS. This SACP is based on DBRS' assessment of both LUCo's business risk (its regulated utility assets) and its financial risk (its capital structure that is more aggressive in its use of leverage). Recent spreads between 'A' rated and 'Baa' rated utility bonds have been approximately 30 basis points. Because this is a tangible and objective measure of a cost-of-capital spread, Staff suggest that 2/3 of this spread be added to the Commission's recent allowed ROE of 9.8% for Spire Missouri in order to adjust for LUCo's higher SACP that is due mainly to its more leveraged capital structure. This is how Staff arrived at its recommended 10% allowed ROE.

L. Conclusion

A just and reasonable rate is one that is fair to the investors and fair to the ratepayers. Fairness to the ratepayers means rates that are not one penny more than is necessary to be fair to the shareholders. Fairness to the shareholders means rates that will produce revenues, on an annual basis, sufficient to cover the Companies' prudent cost of service, which includes an allowed ROR. Using widely-accepted methods of financial analysis and reviewing Wall Street equity analysts' research shows that the COE for gas distribution companies is conservatively around 7%. However, since I have provided this information in past rate cases, including the recent Spire Missouri rate cases in which the Commission decided an allowed ROE of approximately 9.8% was fair and reasonable, I chose to focus on whether Liberty Midstates

[27] "Summary: Laclede Gas Company," S&P RatingsDirect, July 19, 2017.

should be authorized a different allowed ROE based on its more leveraged capital structure. Consequently, I recommend that the Commission allow an ROE that is 20 basis points higher than it allowed Spire Missouri if it adopts Staff's capital structure recommendation.

Based on all the foregoing, it is my considered professional opinion that an authorized ROE for Midstates of 10% (range of 9.5% to 10%) would be reasonable if applied to Staff's recommended common equity ratio. Given that the cost of capital is as real a cost as any other cost of service, reducing this cost in the ratemaking formula to a value closer to its actual cost is consistent with the principles of cost-of-service ratemaking. Using my recommended allowed ROE results in an allowed ROR for Liberty Midstates of 6.76% (range of 6.56% to 6.76%) (*see* Schedule 13). This rate was calculated by applying an embedded cost of long-term debt of 4.51% and an allowed ROE of 10% (range of 9.5% to 10%) to a capital structure consisting of 40.43% common equity.

AN ANALYSIS OF THE COST OF CAPITAL

FOR

LIBERTY UTILITIES (MIDSTATES NATURAL GAS) CORP.
d/b/a LIBERTY UTILITIES

CASE NO. GR-2018-0013

SCHEDULES

BY

DAVID MURRAY

COMMISSION STAFF DIVISION - OPERATIONAL ANALYSIS

FINANCIAL ANALYSIS UNIT

MISSOURI PUBLIC SERVICE COMMISSION

MARCH 2018

Liberty Midstates
Case No. GR-2018-0013

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2-2	Graph of Federal Reserve Discount Rates and Federal Funds Rates Changes
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3-2	Graph of Rate of Inflation
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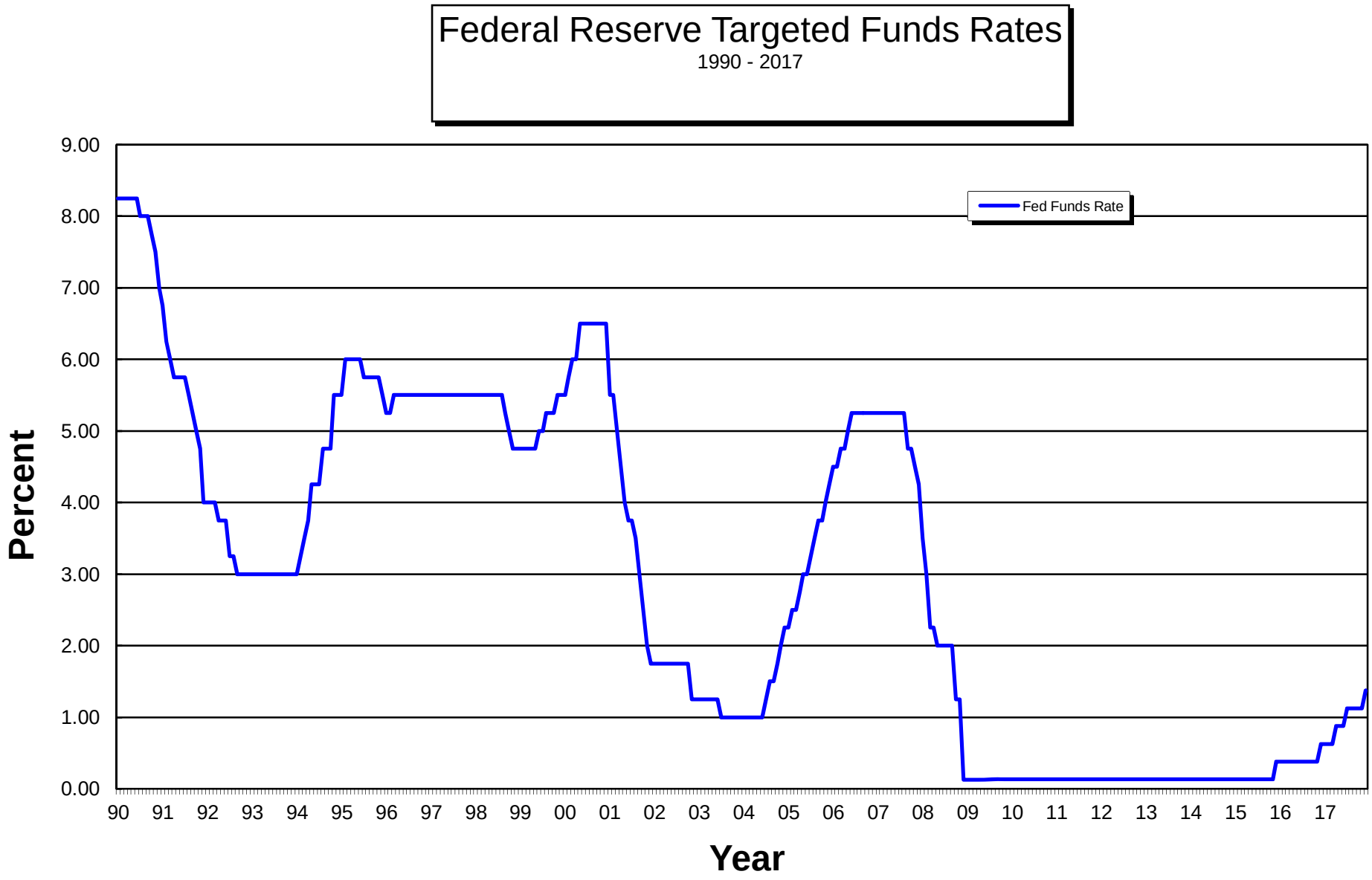
Liberty Midstates
Case No. GR-2018-0013

Federal Reserve Funds Rates Changes

Date	Federal Reserve Funds Rate
01/01/90	8.25%
07/13/90	8.00%
10/29/90	7.75%
11/13/90	7.50%
12/07/90	7.25%
12/18/90	7.00%
01/09/91	6.75%
02/01/91	6.25%
03/08/91	6.00%
04/30/91	5.75%
08/06/91	5.50%
09/13/91	5.25%
10/31/91	5.00%
11/06/91	4.75%
12/06/91	4.50%
12/20/91	4.00%
04/09/92	3.75%
07/02/92	3.25%
09/04/92	3.00%
02/04/94	3.25%
03/22/94	3.50%
04/18/94	3.75%
05/17/94	4.25%
08/16/94	4.75%
11/15/94	5.50%
02/01/95	6.00%
07/06/95	5.75%
12/19/95	5.50%
01/31/96	5.25%
03/25/97	5.50%
09/29/98	5.25%
10/15/98	5.00%
11/17/98	4.75%
06/30/99	5.00%
08/24/99	5.25%
11/16/99	5.50%
02/02/00	5.75%
03/21/00	6.00%
05/19/00	6.50%
01/03/01	6.00%
01/31/01	5.50%
03/20/01	5.00%
04/18/01	4.50%
05/15/01	4.00%
06/27/01	3.75%
08/21/01	3.50%
09/17/01	3.00%
10/02/01	2.50%
11/06/01	2.00%
12/11/01	1.75%

Date	Federal Reserve Funds Rate
11/06/02	1.25%
01/09/03	1.25%
06/25/03	1.00%
06/30/04	1.25%
08/10/04	1.50%
09/21/04	1.75%
11/10/04	2.00%
12/14/04	2.25%
02/02/05	2.50%
03/22/05	2.75%
05/03/05	3.00%
06/30/05	3.25%
08/09/05	3.50%
09/20/05	3.75%
11/01/05	4.00%
12/13/05	4.25%
01/31/06	4.50%
03/28/06	4.75%
05/10/06	5.00%
06/29/06	5.25%
08/17/07	5.25%
09/18/07	4.75%
10/31/07	4.50%
12/11/07	4.25%
01/22/08	3.50%
01/30/08	3.00%
03/18/08	2.25%
04/30/08	2.00%
10/08/08	1.50%
10/29/08	1.00%
12/16/08	0% - .25%
12/17/15	0.25%-0.50%
12/15/16	0.50% - 0.75%
03/16/17	0.75% - 1.00%
06/15/17	1.00% - 1.25%
12/14/17	1.25% - 1.50%

Source: http://www.federalreserve.gov
Note: Interest rates as of December 31 for each year are underlined.


Federal Reserve Targeted Funds Rates
1990 - 2017
Fed Funds Rate
Percent
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17
Year

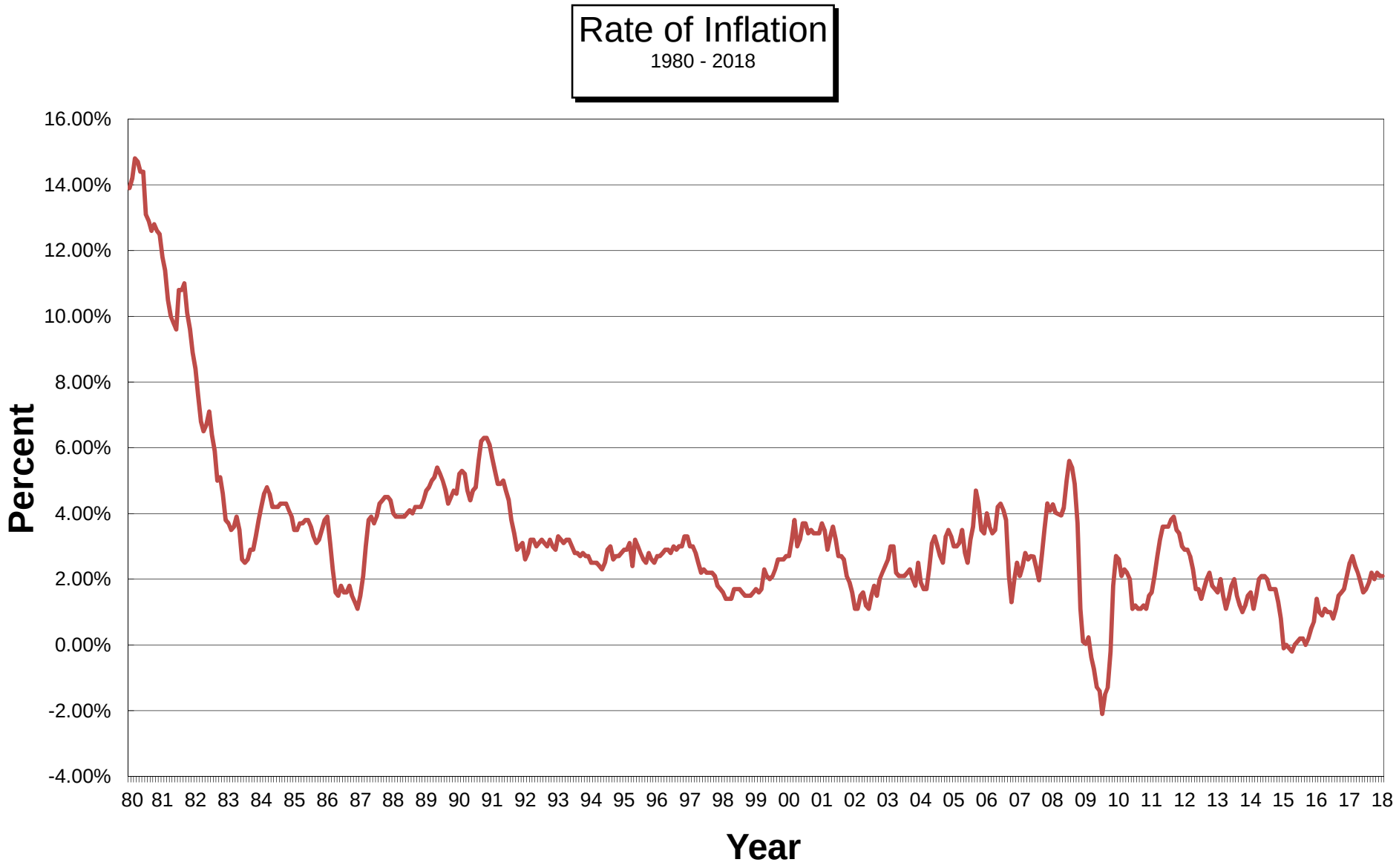
SCHEDULE 2-2

Liberty Midstates
Case No. GR-2018-0013
Rate of Inflation

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	13.90	Jan 1984	4.20	Jan 1988	4.00	Jan 1992	2.60	Jan 1996	2.70	Jan 2000	2.70	Jan 2004	1.90	Jan 2008	4.30	Jan 2012	2.90	Jan 2016	1.40
Feb	14.20	Feb	4.60	Feb	3.90	Feb	2.80	Feb	2.70	Feb	3.20	Feb	1.70	Feb	4.00	Feb	2.90	Feb	1.00
Mar	14.80	Mar	4.80	Mar	3.90	Mar	3.20	Mar	2.80	Mar	3.70	Mar	1.70	Mar	4.00	Mar	2.70	Mar	0.90
Apr	14.70	Apr	4.60	Apr	3.90	Apr	3.20	Apr	2.90	Apr	3.00	Apr	2.30	Apr	3.90	Apr	2.30	Apr	1.10
May	14.40	May	4.20	May	3.90	May	3.00	May	2.90	May	3.20	May	3.10	May	4.20	May	1.70	May	1.00
Jun	14.40	Jun	4.20	Jun	4.00	Jun	3.10	Jun	2.80	Jun	3.70	Jun	3.30	Jun	5.00	Jun	1.70	Jun	1.00
Jul	13.10	Jul	4.20	Jul	4.10	Jul	3.20	Jul	3.00	Jul	3.70	Jul	3.00	Jul	5.60	Jul	1.40	Jul	0.80
Aug	12.90	Aug	4.30	Aug	4.00	Aug	3.10	Aug	2.90	Aug	3.40	Aug	2.70	Aug	5.40	Aug	1.70	Aug	1.10
Sep	12.60	Sep	4.30	Sep	4.20	Sep	3.00	Sep	3.00	Sep	3.50	Sep	2.50	Sep	4.90	Sep	2.00	Sep	1.50
Oct	12.80	Oct	4.30	Oct	4.20	Oct	3.20	Oct	3.00	Oct	3.40	Oct	3.30	Oct	3.70	Oct	2.20	Oct	1.60
Nov	12.60	Nov	4.10	Nov	4.20	Nov	3.00	Nov	3.30	Nov	3.40	Nov	3.50	Nov	1.10	Nov	1.80	Nov	1.70
Dec	12.50	Dec	3.90	Dec	4.40	Dec	2.90	Dec	3.30	Dec	3.40	Dec	3.30	Dec	0.10	Dec	1.70	Dec	2.10
Jan 1981	11.80	Jan 1985	3.50	Jan 1989	4.70	Jan 1993	3.30	Jan 1997	3.00	Jan 2001	3.70	Jan 2005	3.00	Jan 2009	0.00	Jan 2013	1.60	Jan 2017	2.50
Feb	11.40	Feb	3.50	Feb	4.80	Feb	3.20	Feb	3.00	Feb	3.50	Feb	3.00	Feb	0.20	Feb	2.00	Feb	2.70
Mar	10.50	Mar	3.70	Mar	5.00	Mar	3.10	Mar	2.80	Mar	2.90	Mar	3.10	Mar	-0.40	Mar	1.50	Mar	2.40
Apr	10.00	Apr	3.70	Apr	5.10	Apr	3.20	Apr	2.50	Apr	3.30	Apr	3.50	Apr	-0.70	Apr	1.10	Apr	2.20
May	9.80	May	3.80	May	5.40	May	3.20	May	2.20	May	3.60	May	2.80	May	-1.28	May	1.40	May	1.90
Jun	9.60	Jun	3.80	Jun	5.20	Jun	3.00	Jun	2.30	Jun	3.20	Jun	2.50	Jun	-1.40	Jun	1.80	Jun	1.60
Jul	10.80	Jul	3.60	Jul	5.00	Jul	2.80	Jul	2.20	Jul	2.70	Jul	3.20	Jul	-2.10	Jul	2.00	Jul	1.70
Aug	10.80	Aug	3.30	Aug	4.70	Aug	2.80	Aug	2.20	Aug	2.70	Aug	3.60	Aug	-1.50	Aug	1.50	Aug	1.90
Sep	11.00	Sep	3.10	Sep	4.30	Sep	2.70	Sep	2.20	Sep	2.60	Sep	4.70	Sep	-1.30	Sep	1.20	Sep	2.20
Oct	10.10	Oct	3.20	Oct	4.50	Oct	2.80	Oct	2.10	Oct	2.10	Oct	4.30	Oct	-0.20	Oct	1.00	Oct	2.00
Nov	9.60	Nov	3.50	Nov	4.70	Nov	2.70	Nov	1.80	Nov	1.90	Nov	3.50	Nov	1.80	Nov	1.20	Nov	2.20
Dec	8.90	Dec	3.80	Dec	4.60	Dec	2.70	Dec	1.70	Dec	1.60	Dec	3.40	Dec	2.70	Dec	1.50	Dec	2.10
Jan 1982	8.40	Jan 1986	3.90	Jan 1990	5.20	Jan 1994	2.50	Jan 1998	1.60	Jan 2002	1.10	Jan 2006	4.00	Jan 2010	2.60	Jan 2014	1.60	Jan 2018	2.10
Feb	7.60	Feb	3.10	Feb	5.30	Feb	2.50	Feb	1.40	Feb	1.10	Feb	3.60	Feb	2.10	Feb	1.10		
Mar	6.80	Mar	2.30	Mar	5.20	Mar	2.50	Mar	1.40	Mar	1.50	Mar	3.40	Mar	2.30	Mar	1.50		
Apr	6.50	Apr	1.60	Apr	4.70	Apr	2.40	Apr	1.40	Apr	1.60	Apr	3.50	April	2.20	Apr	2.00		
May	6.70	May	1.50	May	4.40	May	2.30	May	1.70	May	1.20	May	4.20	May	2.00	May	2.10		
Jun	7.10	Jun	1.80	Jun	4.70	Jun	2.50	Jun	1.70	Jun	1.10	June	4.30	Jun	1.10	Jun	2.10		
Jul	6.40	Jul	1.60	Jul	4.80	Jul	2.90	Jul	1.70	Jul	1.50	July	4.10	Jul	1.20	Jul	2.00		
Aug	5.90	Aug	1.60	Aug	5.60	Aug	3.00	Aug	1.60	Aug	1.80	Aug	3.80	Aug	1.10	Aug	1.70		
Sep	5.00	Sep	1.80	Sep	6.20	Sep	2.60	Sep	1.50	Sep	1.50	Sep	2.10	Sep	1.10	Sep	1.70		
Oct	5.10	Oct	1.50	Oct	6.30	Oct	2.70	Oct	1.50	Oct	2.00	Oct	1.30	Oct	1.20	Oct	1.70		
Nov	4.60	Nov	1.30	Nov	6.30	Nov	2.70	Nov	1.50	Nov	2.20	Nov	2.00	Nov	1.10	Nov	1.30		
Dec	3.80	Dec	1.10	Dec	6.10	Dec	2.80	Dec	1.60	Dec	2.40	Dec	2.50	Dec	1.50	Dec	0.80		
Jan 1983	3.70	Jan 1987	1.50	Jan 1991	5.70	Jan 1995	2.90	Jan 1999	1.70	Jan 2003	2.60	Jan 2007	2.10	Jan 2011	1.60	Jan 2015	-0.10		
Feb	3.50	Feb	2.10	Feb	5.30	Feb	2.90	Feb	1.60	Feb	3.00	Feb	2.40	Feb	2.10	Feb	0.00		
Mar	3.60	Mar	3.00	Mar	4.90	Mar	3.10	Mar	1.70	Mar	3.00	Mar	2.80	Mar	2.70	Mar	-0.10		
Apr	3.90	Apr	3.80	Apr	4.90	Apr	2.40	Apr	2.30	Apr	2.20	Apr	2.60	Apr	3.20	Apr	-0.20		
May	3.50	May	3.90	May	5.00	May	3.20	May	2.10	May	2.10	May	2.70	May	3.60	May	0.00		
Jun	2.60	Jun	3.70	Jun	4.70	Jun	3.00	Jun	2.00	Jun	2.10	Jun	2.70	Jun	3.60	Jun	0.10		
Jul	2.50	Jul	3.90	Jul	4.40	Jul	2.80	Jul	2.10	Jul	2.10	Jul	2.40	Jul	3.60	Jul	0.20		
Aug	2.60	Aug	4.30	Aug	3.80	Aug	2.60	Aug	2.30	Aug	2.20	Aug	2.00	Aug	3.80	Aug	0.20		
Sep	2.90	Sep	4.40	Sep	3.40	Sep	2.50	Sep	2.60	Sep	2.30	Sep	2.80	Sep	3.90	Sep	0.00		
Oct	2.90	Oct	4.50	Oct	2.90	Oct	2.80	Oct	2.60	Oct	2.00	Oct	3.50	Oct	3.50	Oct	0.20		
Nov	3.30	Nov	4.50	Nov	3.00	Nov	2.60	Nov	2.60	Nov	1.80	Nov	4.30	Nov	3.40	Nov	0.50		
Dec	3.80	Dec	4.40	Dec	3.10	Dec	2.50	Dec	2.70	Dec	1.90	Dec	4.10	Dec	3.00	Dec	0.70		

Source: U.S. Dept of Labor, Bureau of Labor Statistics, Consumer Price Index - All Urban Consumers,
Change for 12-Month Period, Bureau of Labor Statistics,
http://www.bls.gov/schedule/archives/cpi_nr.htm

Liberty Midstates
Case No. GR-2018-0013



SCHEDULE 3-2

Liberty Midstates
Case No. GR-2018-0013

Average Yields on AA, A and BBB Public Utility Bonds

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	12.12	Jan 1984	13.40	Jan 1988	10.75	Jan 1992	8.67	Jan 1996	7.20	Jan 2000	8.22	Jan 2004	6.23	Jan 2008	6.08	Jan 2012	4.48	Jan 2016	4.62
Feb	13.48	Feb	13.50	Feb	10.11	Feb	8.77	Feb	7.37	Feb	8.10	Feb	6.17	Feb	6.28	Feb	4.47	Feb	4.44
Mar	14.33	Mar	14.03	Mar	10.11	Mar	8.84	Mar	7.72	Mar	8.14	Mar	6.01	Mar	6.29	Mar	4.59	Mar	4.4
Apr	13.50	Apr	14.30	Apr	10.53	Apr	8.79	Apr	7.88	Apr	8.14	Apr	6.38	Apr	6.36	Apr	4.54	Apr	4.16
May	12.17	May	14.95	May	10.75	May	8.72	May	7.99	May	8.55	May	6.68	May	6.38	May	4.36	May	4.06
Jun	11.87	Jun	15.16	Jun	10.71	Jun	8.64	Jun	8.07	Jun	8.22	Jun	6.53	Jun	6.50	Jun	4.26	June	3.93
Jul	12.12	Jul	14.92	Jul	10.96	Jul	8.46	Jul	8.02	Jul	8.17	Jul	6.34	Jul	6.50	Jul	4.12	July	3.70
Aug	12.82	Aug	14.29	Aug	11.09	Aug	8.34	Aug	7.84	Aug	8.05	Aug	6.18	Aug	6.48	Aug	4.18	Aug	3.73
Sep	13.29	Sep	14.04	Sep	10.56	Sep	8.32	Sep	8.01	Sep	8.16	Sep	6.01	Sep	6.59	Sep	4.17	Sep	3.80
Oct	13.53	Oct	13.68	Oct	9.92	Oct	8.44	Oct	7.76	Oct	8.08	Oct	5.95	Oct	7.70	Oct	4.04	Oct	3.90
Nov	14.07	Nov	13.15	Nov	9.89	Nov	8.53	Nov	7.48	Nov	8.03	Nov	5.97	Nov	7.80	Nov	3.95	Nov	4.21
Dec	14.48	Dec	12.96	Dec	10.02	Dec	8.36	Dec	7.58	Dec	7.79	Dec	5.93	Dec	6.87	Dec	4.10	Dec	4.39
Jan 1981	14.22	Jan 1985	12.88	Jan 1989	10.02	Jan 1993	8.23	Jan 1997	7.79	Jan 2001	7.76	Jan 2005	5.80	Jan 2009	6.77	Jan 2013	4.24	Jan 2017	4.24
Feb	14.84	Feb	13.00	Feb	10.02	Feb	8.00	Feb	7.68	Feb	7.69	Feb	5.64	Feb	6.72	Feb	4.29	Feb	4.25
Mar	14.86	Mar	13.66	Mar	10.16	Mar	7.85	Mar	7.92	Mar	7.59	Mar	5.86	Mar	6.85	Mar	4.29	Mar	4.30
Apr	15.32	Apr	13.42	Apr	10.14	Apr	7.76	Apr	8.08	Apr	7.81	Apr	5.72	Apr	6.90	Apr	4.08	Apr	4.19
May	15.84	May	12.89	May	9.92	May	7.78	May	7.94	May	7.88	May	5.60	May	6.83	May	4.24	May	4.19
Jun	15.27	Jun	11.91	Jun	9.49	Jun	7.68	Jun	7.77	Jun	7.75	Jun	5.39	June	6.54	Jun	4.63	June	4.01
Jul	15.87	Jul	11.88	Jul	9.34	Jul	7.53	Jul	7.52	Jul	7.71	Jul	5.50	July	6.15	Jul	4.78	Jul	4.06
Aug	16.33	Aug	11.93	Aug	9.37	Aug	7.21	Aug	7.57	Aug	7.57	Aug	5.51	Aug	5.80	Aug	4.85	Aug	3.92
Sep	16.89	Sep	11.95	Sep	9.43	Sep	7.01	Sep	7.50	Sep	7.73	Sep	5.54	Sep	5.60	Sep	4.90	Sep	3.93
Oct	16.76	Oct	11.84	Oct	9.37	Oct	6.99	Oct	7.37	Oct	7.64	Oct	5.79	Oct	5.64	Oct	4.78	Oct	3.97
Nov	15.50	Nov	11.33	Nov	9.33	Nov	7.30	Nov	7.24	Nov	7.61	Nov	5.88	Nov	5.71	Nov	4.86	Nov	3.88
Dec	15.77	Dec	10.82	Dec	9.31	Dec	7.33	Dec	7.16	Dec	7.86	Dec	5.83	Dec	5.86	Dec	4.88	Dec	3.85
Jan 1982	16.73	Jan 1986	10.66	Jan 1990	9.44	Jan 1994	7.31	Jan 1998	7.03	Jan 2002	7.69	Jan 2006	5.77	Jan 2010	5.83	Jan 2014	4.72	Jan 2018	3.91
Feb	16.72	Feb	10.16	Feb	9.66	Feb	7.44	Feb	7.09	Feb	7.62	Feb	5.83	Feb	5.94	Feb	4.64		
Mar	16.07	Mar	9.33	Mar	9.75	Mar	7.83	Mar	7.13	Mar	7.83	Mar	5.98	Mar	5.90	Mar	4.64		
Apr	15.82	Apr	9.02	Apr	9.87	Apr	8.20	Apr	7.12	Apr	7.74	Apr	6.28	Apr	5.87	Apr	4.52		
May	15.60	May	9.52	May	9.89	May	8.32	May	7.11	May	7.76	May	6.39	May	5.59	May	4.37		
Jun	16.18	Jun	9.51	Jun	9.69	Jun	8.31	Jun	6.99	Jun	7.67	June	6.39	June	5.62	Jun	4.42		
Jul	16.04	Jul	9.19	Jul	9.66	Jul	8.47	Jul	6.99	Jul	7.54	July	6.37	July	5.41	Jul	4.35		
Aug	15.22	Aug	9.15	Aug	9.84	Aug	8.41	Aug	6.96	Aug	7.34	Aug	6.20	Aug	5.10	Aug	4.28		
Sep	14.56	Sep	9.42	Sep	10.01	Sep	8.65	Sep	6.88	Sep	7.23	Sep	6.03	Sep	5.10	Sep	4.40		
Oct	13.88	Oct	9.39	Oct	9.94	Oct	8.88	Oct	6.88	Oct	7.43	Oct	6.01	Oct	5.20	Oct	4.24		
Nov	13.58	Nov	9.15	Nov	9.76	Nov	9.00	Nov	6.96	Nov	7.31	Nov	5.82	Nov	5.45	Nov	4.29		
Dec	13.55	Dec	8.96	Dec	9.57	Dec	8.79	Dec	6.84	Dec	7.20	Dec	5.83	Dec	5.64	Dec	4.18		
Jan 1983	13.46	Jan 1987	8.77	Jan 1991	9.56	Jan 1995	8.77	Jan 1999	6.87	Jan 2003	7.13	Jan 2007	5.96	Jan 2011	5.64	Jan 2015	3.83		
Feb	13.60	Feb	8.81	Feb	9.31	Feb	8.56	Feb	7.00	Feb	6.92	Feb	5.91	Feb	5.73	Feb	3.91		
Mar	13.28	Mar	8.75	Mar	9.39	Mar	8.41	Mar	7.18	Mar	6.80	Mar	5.87	Mar	5.62	Mar	3.97		
Apr	13.03	Apr	9.30	Apr	9.30	Apr	8.30	Apr	7.16	Apr	6.68	Apr	6.01	Apr	5.62	Apr	3.96		
May	13.00	May	9.82	May	9.29	May	7.93	May	7.42	May	6.35	May	6.03	May	5.38	May	4.38		
Jun	13.17	Jun	9.87	Jun	9.44	Jun	7.62	Jun	7.70	Jun	6.21	June	6.34	June	5.32	June	4.60		
Jul	13.28	Jul	10.01	Jul	9.40	Jul	7.73	Jul	7.66	Jul	6.54	July	6.28	July	5.34	July	4.63		
Aug	13.50	Aug	10.33	Aug	9.16	Aug	7.86	Aug	7.86	Aug	6.78	Aug	6.28	Aug	4.78	Aug	4.54		
Sep	13.35	Sep	11.00	Sep	9.03	Sep	7.62	Sep	7.87	Sep	6.58	Sep	6.24	Sep	4.61	Sep	4.69		
Oct	13.19	Oct	11.32	Oct	8.99	Oct	7.46	Oct	8.02	Oct	6.50	Oct	6.17	Oct	4.66	Oct	4.63		
Nov	13.33	Nov	10.82	Nov	8.93	Nov	7.40	Nov	7.86	Nov	6.44	Nov	6.04	Nov	4.37	Nov	4.73		
Dec	13.48	Dec	10.99	Dec	8.76	Dec	7.21	Dec	8.04	Dec	6.36	Dec	6.23	Dec	4.47	Dec	4.69		

Source:
Mergent Bond Record

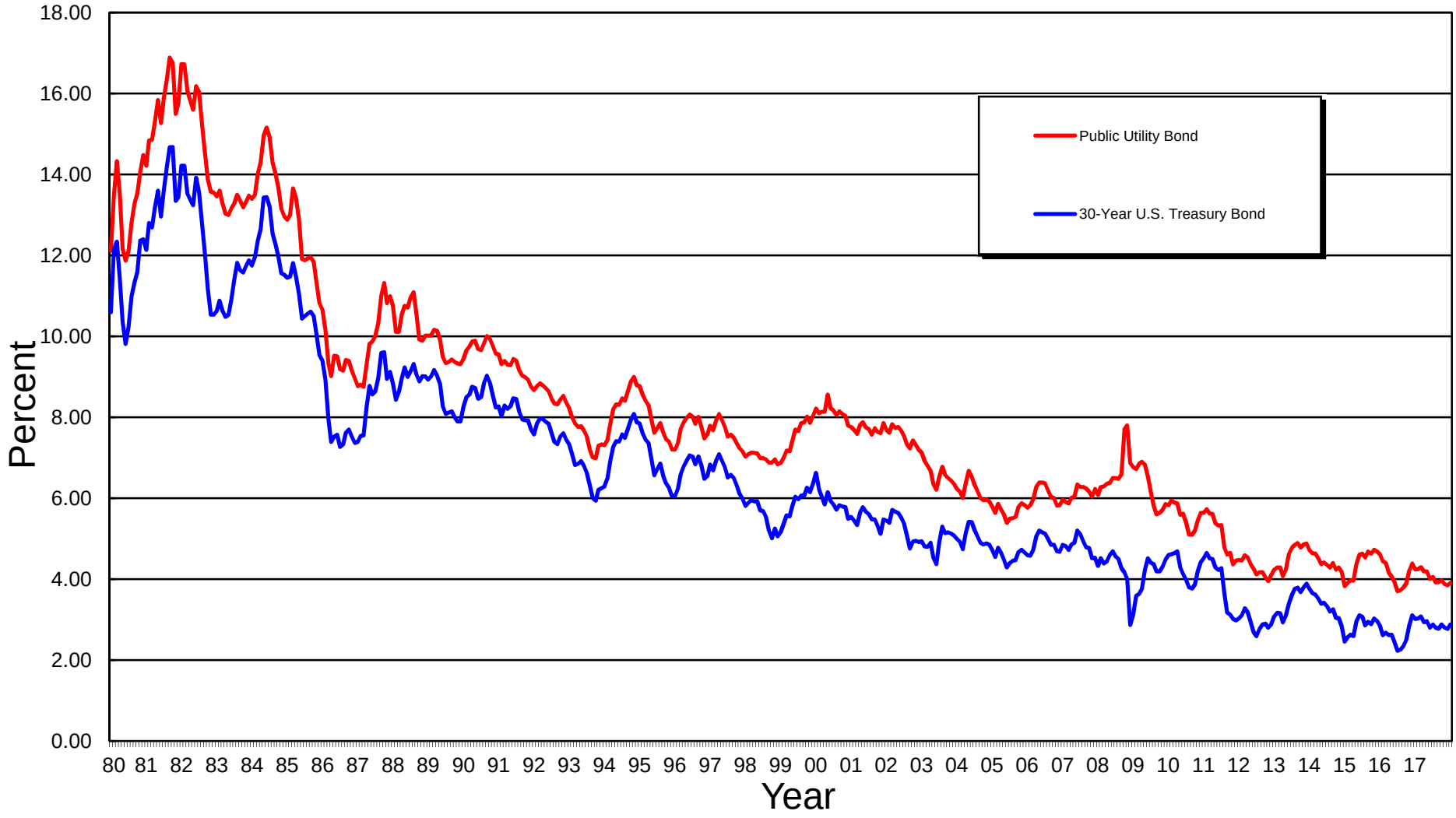
Liberty Midstates
Case No. GR-2018-0013

Average Yields on Thirty-Year U.S. Treasury Bonds

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	10.60	Jan 1984	11.75	Jan 1988	8.83	Jan 1992	7.58	Jan 1996	6.05	Jan 2000	6.63	Jan 2004	4.99	Jan 2008	4.33	Jan 2012	3.03	Jan 2016	2.86
Feb	12.13	Feb	11.95	Feb	8.43	Feb	7.85	Feb	6.24	Feb	6.23	Feb	4.93	Feb	4.52	Feb	3.11	Feb	2.62
Mar	12.34	Mar	12.38	Mar	8.63	Mar	7.97	Mar	6.60	Mar	6.05	Mar	4.74	Mar	4.39	Mar	3.28	Mar	2.68
Apr	11.40	Apr	12.65	Apr	8.95	Apr	7.96	Apr	6.79	Apr	5.85	Apr	5.14	Apr	4.44	Apr	3.18	Apr	2.62
May	10.36	May	13.43	May	9.23	May	7.89	May	6.93	May	6.15	May	5.42	May	4.60	May	2.93	May	2.63
Jun	9.81	Jun	13.44	Jun	9.00	Jun	7.84	Jun	7.06	Jun	5.93	Jun	5.41	Jun	4.69	Jun	2.70	June	2.45
Jul	10.24	Jul	13.21	Jul	9.14	Jul	7.60	Jul	7.03	Jul	5.85	Jul	5.22	Jul	4.57	Jul	2.59	July	2.23
Aug	11.00	Aug	12.54	Aug	9.32	Aug	7.39	Aug	6.84	Aug	5.72	Aug	5.06	Aug	4.50	Aug	2.77	Aug	2.26
Sep	11.34	Sep	12.29	Sep	9.06	Sep	7.34	Sep	7.03	Sep	5.83	Sep	4.90	Sep	4.27	Sep	2.88	Sep	2.35
Oct	11.59	Oct	11.98	Oct	8.89	Oct	7.53	Oct	6.81	Oct	5.80	Oct	4.86	Oct	4.17	Oct	2.90	Oct	2.50
Nov	12.37	Nov	11.56	Nov	9.02	Nov	7.61	Nov	6.48	Nov	5.78	Nov	4.89	Nov	4.00	Nov	2.80	Nov	2.86
Dec	12.40	Dec	11.52	Dec	9.01	Dec	7.44	Dec	6.55	Dec	5.49	Dec	4.86	Dec	2.87	Dec	2.88	Dec	3.11
Jan 1981	12.14	Jan 1985	11.45	Jan 1989	8.93	Jan 1993	7.34	Jan 1997	6.83	Jan 2001	5.54	Jan 2005	4.73	Jan 2009	3.13	Jan 2013	3.08	Jan 2017	3.02
Feb	12.80	Feb	11.47	Feb	9.01	Feb	7.09	Feb	6.69	Feb	5.45	Feb	4.55	Feb	3.59	Feb	3.17	Feb	3.03
Mar	12.69	Mar	11.81	Mar	9.17	Mar	6.82	Mar	6.93	Mar	5.34	Mar	4.78	Mar	3.64	Mar	3.16	Mar	3.08
Apr	13.20	Apr	11.47	Apr	9.03	Apr	6.85	Apr	7.09	Apr	5.65	Apr	4.65	Apr	3.76	Apr	2.93	Apr	2.94
May	13.60	May	11.05	May	8.83	May	6.92	May	6.94	May	5.78	May	4.49	May	4.23	May	3.11	May	2.96
Jun	12.96	Jun	10.44	Jun	8.27	Jun	6.81	Jun	6.77	Jun	5.67	Jun	4.29	Jun	4.52	Jun	3.40	June	2.80
Jul	13.59	Jul	10.50	Jul	8.08	Jul	6.63	Jul	6.51	Jul	5.61	Jul	4.41	July	4.41	Jul	3.61	Jul	2.88
Aug	14.17	Aug	10.56	Aug	8.12	Aug	6.32	Aug	6.58	Aug	5.48	Aug	4.46	Aug	4.37	Aug	3.76	Aug	2.80
Sep	14.67	Sep	10.61	Sep	8.15	Sep	6.00	Sep	6.50	Sep	5.48	Sep	4.47	Sep	4.19	Sep	3.79	Sep	2.78
Oct	14.68	Oct	10.50	Oct	8.00	Oct	5.94	Oct	6.33	Oct	5.32	Oct	4.67	Oct	4.19	Oct	3.68	Oct	2.88
Nov	13.35	Nov	10.06	Nov	7.90	Nov	6.21	Nov	6.11	Nov	5.12	Nov	4.73	Nov	4.31	Nov	3.80	Nov	2.80
Dec	13.45	Dec	9.54	Dec	7.90	Dec	6.25	Dec	5.99	Dec	5.48	Dec	4.66	Dec	4.49	Dec	3.89	Dec	2.77
Jan 1982	14.22	Jan 1986	9.40	Jan 1990	8.26	Jan 1994	6.29	Jan 1998	5.81	Jan 2002	5.44	Jan 2006	4.59	Jan 2010	4.60	Jan 2014	3.77	Jan 2018	2.88
Feb	14.22	Feb	8.93	Feb	8.50	Feb	6.49	Feb	5.89	Feb	5.39	Feb	4.58	Feb	4.62	Feb	3.66		
Mar	13.53	Mar	7.96	Mar	8.56	Mar	6.91	Mar	5.95	Mar	5.71	Mar	4.73	Mar	4.64	Mar	3.62		
Apr	13.37	Apr	7.39	Apr	8.76	Apr	7.27	Apr	5.92	Apr	5.67	Apr	5.06	Apr	4.69	Apr	3.52		
May	13.24	May	7.52	May	8.73	May	7.41	May	5.93	May	5.64	May	5.20	May	4.29	May	3.39		
Jun	13.92	Jun	7.57	Jun	8.46	Jun	7.40	Jun	5.70	Jun	5.52	Jun	5.16	Jun	4.13	Jun	3.42		
Jul	13.55	Jul	7.27	Jul	8.50	Jul	7.58	Jul	5.68	Jul	5.38	July	5.13	July	3.99	Jul	3.33		
Aug	12.77	Aug	7.33	Aug	8.86	Aug	7.49	Aug	5.54	Aug	5.08	Aug	5.00	Aug	3.80	Aug	3.20		
Sep	12.07	Sep	7.62	Sep	9.03	Sep	7.71	Sep	5.20	Sep	4.76	Sep	4.85	Sep	3.77	Sep	3.26		
Oct	11.17	Oct	7.70	Oct	8.86	Oct	7.94	Oct	5.01	Oct	4.93	Oct	4.85	Oct	3.87	Oct	3.04		
Nov	10.54	Nov	7.52	Nov	8.54	Nov	8.08	Nov	5.25	Nov	4.95	Nov	4.69	Nov	4.19	Nov	3.04		
Dec	10.54	Dec	7.37	Dec	8.24	Dec	7.87	Dec	5.06	Dec	4.92	Dec	4.68	Dec	4.42	Dec	2.83		
Jan 1983	10.63	Jan 1987	7.39	Jan 1991	8.27	Jan 1995	7.85	Jan 1999	5.16	Jan 2003	4.94	Jan 2007	4.85	Jan 2011	4.52	Jan 2015	2.46		
Feb	10.88	Feb	7.54	Feb	8.03	Feb	7.61	Feb	5.37	Feb	4.81	Feb	4.82	Feb	4.65	Feb	2.57		
Mar	10.63	Mar	7.55	Mar	8.29	Mar	7.45	Mar	5.58	Mar	4.80	Mar	4.72	Mar	4.51	Mar	2.63		
Apr	10.48	Apr	8.25	Apr	8.21	Apr	7.36	Apr	5.55	Apr	4.90	Apr	4.86	Apr	4.50	Apr	2.59		
May	10.53	May	8.78	May	8.27	May	6.95	May	5.81	May	4.53	May	4.90	May	4.29	May	2.96		
Jun	10.93	Jun	8.57	Jun	8.47	Jun	6.57	Jun	6.04	Jun	4.37	Jun	5.20	Jun	4.23	Jun	3.11		
Jul	11.40	Jul	8.64	Jul	8.45	Jul	6.72	Jul	5.98	Jul	4.93	July	5.11	Jul	4.27	Jul	3.07		
Aug	11.82	Aug	8.97	Aug	8.14	Aug	6.86	Aug	6.07	Aug	5.30	Aug	4.93	Aug	3.65	Aug	2.86		
Sep	11.63	Sep	9.59	Sep	7.95	Sep	6.55	Sep	6.07	Sep	5.14	Sep	4.79	Sep	3.18	Sep	2.95		
Oct	11.58	Oct	9.61	Oct	7.93	Oct	6.37	Oct	6.26	Oct	5.16	Oct	4.77	Oct	3.13	Oct	2.89		
Nov	11.75	Nov	8.95	Nov	7.92	Nov	6.26	Nov	6.15	Nov	5.13	Nov	4.52	Nov	3.02	Nov	3.03		
Dec	11.88	Dec	9.12	Dec	7.70	Dec	6.06	Dec	6.35	Dec	5.08	Dec	4.53	Dec	2.98	Dec	2.97		

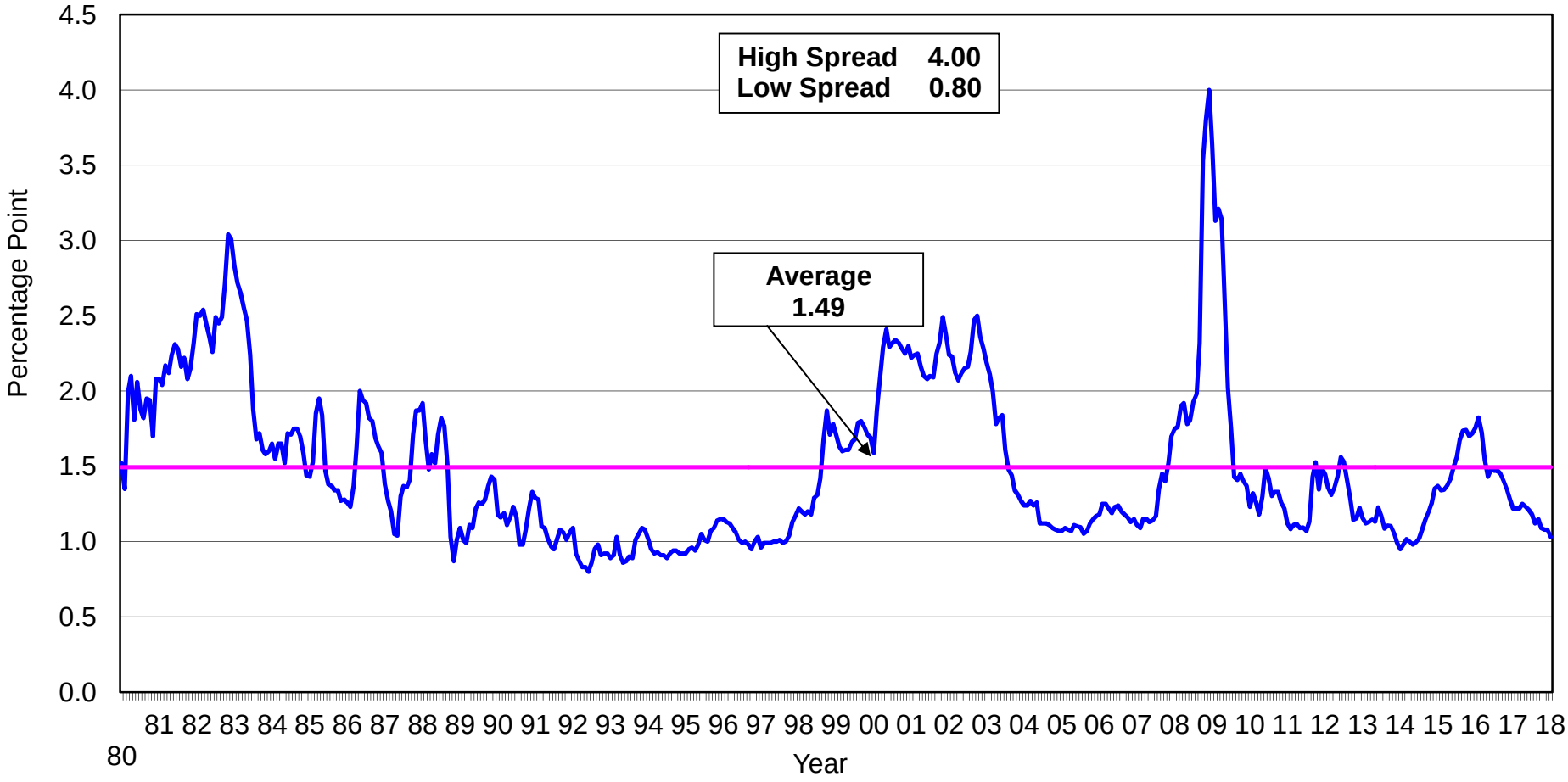
Liberty Midstates
Case No. GR-2018-0013

Average Yields on Public Utility Bonds and Thirty-Year U.S. Treasury Bonds (1980 - 2018)

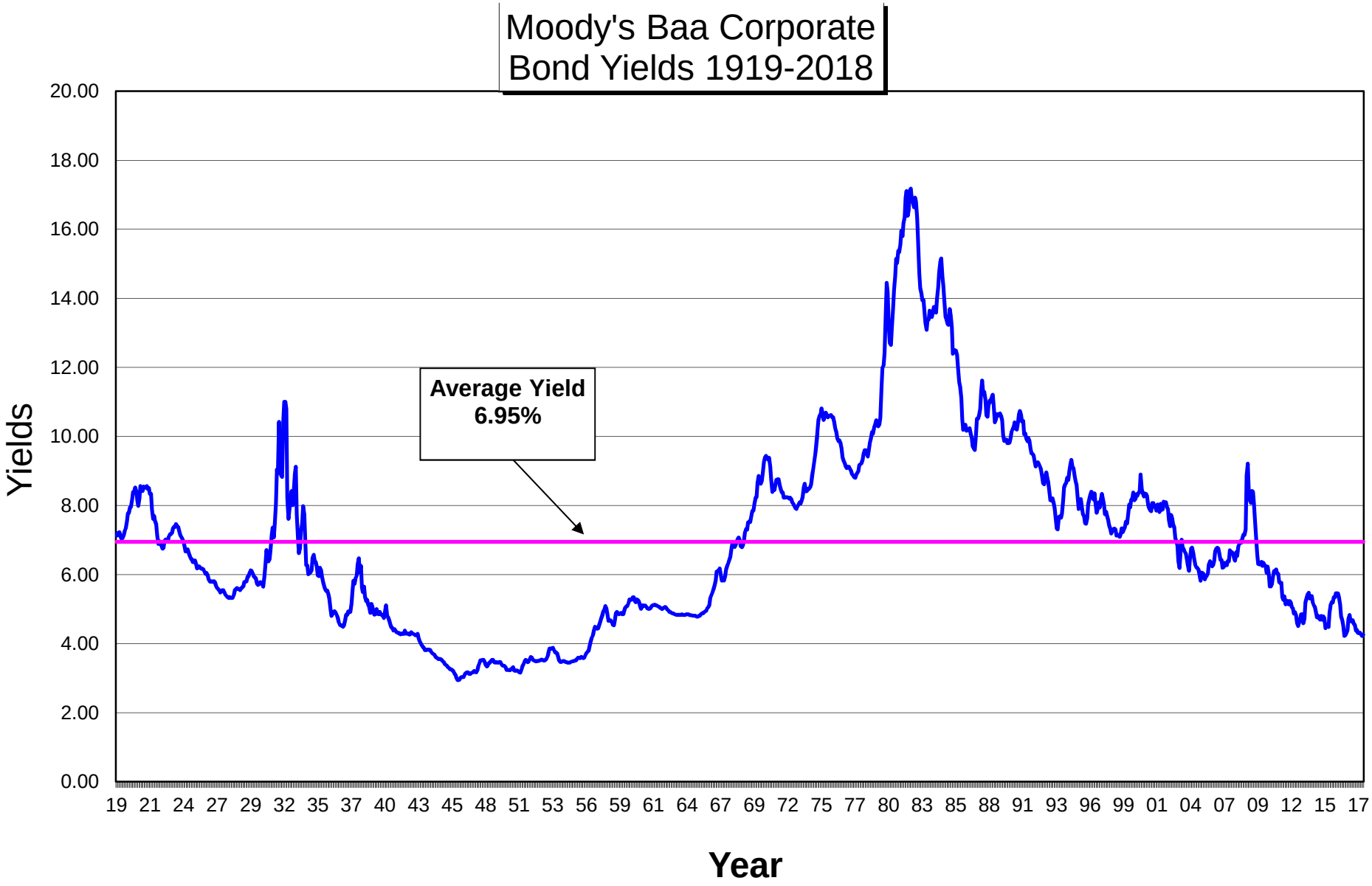


SCHEDULE 4-3

Monthly Spreads Between Yields on Public Utility Bonds and Thirty-Year U.S. Treasury Bonds (1980 - 2018)



SCHEDULE 4-4



Source: St. Louis Federal Reserve Website: http://stlouisfed.org

Schedule 4-5

Liberty Midstates
Case No. GR-2018-0013

Historical Capital Structures for Algonquin Power & Utilities Corp. and Liberty Utilities Company (Including Short-Term Debt)

ALGONQUIN POWER & UTILITIES CORP.

(in thousands of Canadian Dollars)

Capital Components	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017
Common Equity and Noncontrolling Equity	$1,285,583	$1,349,415	$1,622,583	$2,078,059	$2,272,116	$3,339,988	$3,444,414	$3,341,091
Preferred Stock and Mezzanine	$116,546	$116,546	$225,951	$239,556	$243,239	$280,562	$275,300	$274,595
Long-Term Debt[1]	$717,622	$1,068,247	$1,243,114	$1,478,022	$4,047,547	$4,558,992	$3,986,214	$3,800,078
Short-term Debt[2]	$54,434	$210,190	$47,298	$27,300	$242,947	$233,087	$450,269	$653,433
Total	$2,174,185	$2,744,398	$3,138,946	$3,822,937	$6,805,849	$8,412,629	$8,156,197	$8,069,197

Capital Structure	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017	**Average for 2012 - 2016**	**Average for 12/31/2016 - 9/30/201**
Common Equity and Noncontrolling Equity	59.13%	49.17%	51.69%	54.36%	33.38%	39.70%	42.23%	41.41%	49.55%	39.18%
Preferred Stock and Mezzanine	5.36%	4.25%	7.20%	6.27%	3.57%	3.34%	3.38%	3.40%	5.33%	3.42%
Long-Term Debt[1]	33.01%	38.92%	39.60%	38.66%	59.47%	54.19%	48.87%	47.09%	41.93%	52.41%
Short-term Debt[2]	2.50%	7.66%	1.51%	0.71%	3.57%	2.77%	5.52%	8.10%	3.19%	4.99%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

LIBERTY UTILITIES COMPANY (Unadjusted)

(in thousands of US Dollars)

Capital Components	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017
Common Equity	$350,733	$480,697	$645,188	$717,289	$1,960,034	$1,998,441	$1,999,413	$2,016,450
Long-Term Debt[1]	$372,574	$535,823	$535,106	$522,930	$1,243,464	$2,123,000	$2,039,553	$1,986,983
Short-Term Debt[2]	$27,500	$80,500	$20,500	$0	$22,500	$30,000	$18,750	$0
Total	$750,807	$1,097,020	$1,200,794	$1,240,219	$3,225,998	$4,151,441	$4,057,716	$4,003,433

Capital Structure	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017	**Average for 2012 - 2016**	**Average for 12/31/2016 - 9/30/201**
Common Equity	46.71%	43.82%	53.73%	57.84%	60.76%	48.14%	49.27%	50.37%	52.57%	52.13%
Long-Term Debt[1]	49.62%	48.84%	44.56%	42.16%	38.55%	51.14%	50.26%	49.63%	44.75%	47.39%
Short-Term Debt[2]	3.66%	7.34%	1.71%	0.00%	0.70%	0.72%	0.46%	0.00%	2.68%	0.47%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

LIBERTY UTILITIES COMPANY (Adjusted Capital Structures for Guarantees and Intermediate Holding Company Debt)

(in thousands of US Dollars)

Capital Components	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017
Common Equity	$350,733	$480,697	$645,188	$557,289 [3]	$1,565,034 [3,4]	$1,603,441 [3,4,5]	$1,604,413 [3,4,5]	$1,621,450 [3,4,5]
Long-Term Debt[1]	$372,574	$535,823	$535,106	$682,930 [3]	$1,638,464 [3,4]	$2,518,000 [3,4,5]	$2,434,553 [3,4,5]	$2,381,983 [3,4,5]
Short-Term Debt[2]	$27,500	$80,500	$20,500	$0	$22,500	$30,000	$18,750	$118,000
Total	$750,807	$1,097,020	$1,200,794	$1,240,219	$3,225,998	$4,151,441	$4,057,716	$4,121,433

Capital Structure	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017	**Average for 2012 - 2016**	**Average for 12/31/2016 - 9/30/201**
Common Equity	46.71%	43.82%	53.73%	44.93%	48.51%	38.62%	39.54%	40.50%	47.54%	41.79%
Long-Term Debt[1]	49.62%	48.84%	44.56%	55.07%	50.79%	60.65%	60.00%	59.50%	49.78%	57.73%
Short-Term Debt[2]	3.66%	7.34%	1.71%	0.00%	0.70%	0.72%	0.46%	2.95%	2.68%	1.21%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	102.95%	100.00%	100.74%

1. Long-term debt includes current maturities of long-term debt, Series C Preferred and convertible securities. Used notes from Liberty Utilities Company's Financial Statements for initial total debt balance and then deducted commercial paper and revolving credit facilities from this debt.
2. Short-term debt excludes current or maturing portion of long-term debt
3. See Note 9.(b) attached to Liberty Utilities Company's 12/31/2015 financial statements for information about Staff's $160 million reduction of equity and increase in debt.
4. See Note 9.(b) attached to Liberty Utilities Company's 12/31/2016 financial statements for information about Staff's $235 million reduction of equity and increase in debt.
5. See Note 7.(b) attached to Liberty Utilities Company's 3/31/2017 financial statements for information about Staff's $100 million reduction of equity and increase in debt.

Liberty Midstates
Case No. GR-2018-0013

Historical Capital Structures for Algonquin Power & Utilities Corporation and Liberty Utilities Company (Excluding Short-Term Debt)

ALGONQUIN POWER & UTILITIES CORP.

(in thousands of Canadian Dollars)

Capital Components	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017
Common Equity and Noncontrolling Equity	$1,285,583	$1,349,415	$1,622,583	$2,078,059	$2,272,116	$3,339,988	$3,444,414	$3,341,091
Preferred Stock and Mezzanine	$116,546	$116,546	$225,951	$239,556	$243,239	$280,562	$275,300	$274,595
Long-Term Debt [1]	$717,622	$1,068,247	$1,243,114	$1,478,022	$4,047,547	$4,558,992	$3,986,214	$3,800,078
Total	$2,119,751	$2,534,208	$3,091,648	$3,795,637	$6,562,902	$8,179,542	$7,705,928	$7,415,764

Capital Structure	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017	**Average for 2012 - 2016**	**Average for 12/31/2016 - 9/30/20**
Common Equity and Noncontrolling Equity	60.65%	53.25%	52.48%	54.75%	34.62%	40.83%	44.70%	45.05%	51.15%	41.30%
Preferred Stock and Mezzanine	5.50%	4.60%	7.31%	6.31%	3.71%	3.43%	3.57%	3.70%	5.48%	3.60%
Long-Term Debt [1]	33.85%	42.15%	40.21%	38.94%	61.67%	55.74%	51.73%	51.24%	43.37%	55.10%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

LIBERTY UTILITIES COMPANY (Unadjusted)

(in thousands of US Dollars)

Capital Components	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017
Common Equity	$350,733	$480,697	$645,188	$717,289	$1,960,034	$1,998,441	$1,999,413	$2,016,450
Long-Term Debt [1]	$372,574	$535,823	$535,106	$522,930	$1,243,464	$2,123,000	$2,039,553	$1,986,983
Total	$723,307	$1,016,520	$1,180,294	$1,240,219	$3,203,498	$4,121,441	$4,038,966	$4,003,433

Capital Structure	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017	**Average for 2012 - 2016**	**Average for 12/31/2016 - 9/30/20**
Common Equity	48.49%	47.29%	54.66%	57.84%	61.18%	48.49%	49.50%	50.37%	53.89%	52.39%
Long-Term Debt [1]	51.51%	52.71%	45.34%	42.16%	38.82%	51.51%	50.50%	49.63%	46.11%	47.61%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

LIBERTY UTILITIES COMPANY (Adjusted Capital Structures for Guarantees and Intermediate Holding Company Debt)

(in thousands of US Dollars)

Capital Components	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017
Common Equity	$350,733	$480,697	$645,188	$557,289 [2]	$1,565,034 [2,3]	$1,603,441 [2,3,4]	$1,604,413 [2,3,4]	$1,621,450 [2,3,4]
Long-Term Debt [1]	$372,574	$535,823	$535,106	$682,930 [2]	$1,638,464 [2,3]	$2,518,000 [2,3,4]	$2,434,553 [2,3,4]	$2,381,983 [2,3,4]
Total	$723,307	$1,016,520	$1,180,294	$1,240,219	$3,203,498	$4,121,441	$4,038,966	$4,003,433

Capital Structure	2012	2013	2014	2015	2016	3/31/2017	6/30/2017	9/30/2017	**Average for 2012 - 2016**	**Average for 12/31/2016 - 9/30/20**
Common Equity	48.49%	47.29%	54.66%	44.93%	48.85%	38.90%	39.72%	40.50%	48.85%	42.00%
Long-Term Debt [1]	51.51%	52.71%	45.34%	55.07%	51.15%	61.10%	60.28%	59.50%	51.15%	58.00%
Total	51.51%	52.71%	45.34%	55.07%	51.15%	61.10%	60.28%	59.50%	100.00%	100.00%

1. Long-term debt includes current maturities of long-term debt, Series C Preferred and convertible securities. Used notes from Liberty Utilities Company's Financial Statements for initial total debt balance and then deducted commercial paper and revolving credit facilities from this debt.
2. See Note 9.(b) attached to Liberty Utilities Company's 12/31/2015 financial statements for information about Staff's $160 million reduction of equity and increase in debt.
3. See Note 9.(b) attached to Liberty Utilities Company's 12/31/2016 financial statements for information about Staff's $235 million reduction of equity and increase in debt.
4. See Note 7.(b) attached to Liberty Utilities Company's 3/31/2017 financial statements for information about Staff's $100 million reduction of equity and increase in debt.

LIBERTY MIDSTATES
CASE NO. GR-2018-0013

Capital Structure Scenarios as of September 30, 2017
for Liberty Utilities (Midstates Natural Gas) Corp.

Short-Term Debt Included

Liberty Utilities Company
(thousands of United States dollars)

Capital Component	Dollar Amount	Percentage of Capital
Common Stock Equity	$ 1,621,450	39.75%
Long-Term Debt	$ 2,339,500	57.36%
Short-Term Debt	$ 118,000	2.89%
Total Capitalization	**$ 4,078,950**	**100.00%**

Sources: Liberty Utilities Company's September 30, 2017 Unaudited Financial Statements Provided in Response to Staff Data Request No. 117 and Liberty Midstates' response to Staff Data Request No. 108.

Algonquin Power & Utilities Corporation
(thousands of Canadian dollars)

Capital Component		Dollar Amount	Percentage of Capital
Common Stock Equity		$ 3,341,091	41.74%
Long-Term Debt			
Bonds and Notes[1]	3610536		
Liberty Term Facility[2]	168480		
Power Term Facility[2]	118684.8		
Total Long-Term Debt		$ 3,897,701	48.69%
Preferred Stock[3]		$ 231,254	2.89%
Short-Term Debt			
Revolving Credit Facilities	534748		
Total Short-Term Debt		$ 534,748	6.68%
Total Capitalization		**$ 8,004,794**	**100.00%**

Sources: Algonquin Power & Utilities Corporation's September 30, 2017 Unaudited Financial Statements, Note 7. to 9/30/2017 Unaudited Financial Statements and Liberty Midstates' Response to Staff Data Request No. 108.
Notes:
1. Bonds and Notes is the total of Canadian Dollar and US Dollar Borrowings shown in Note 7 to APUC's 9/30/2017 Financial Statements.
2. Liberty Midstates response to Staff Data Request No. 108.
3. Preferred Stock including Series C Preferred Shares on 9/30/2017 APUC Balance Sheet

Short-Term Debt Excluded

Liberty Utilities Company
(thousands of United States dollars)

Capital Component	Dollar Amount	Percentage of Capital
Common Stock Equity	$ 1,621,450	40.94%
Long-Term Debt	$ 2,339,500	59.06%
Short-Term Debt	$ -	0.00%
Total Capitalization	**$ 3,960,950**	**100.00%**

Algonquin Power & Utilities Corporation
(thousands of Canadian dollars)

Capital Component		Dollar Amount	Percentage of Capital
Common Stock Equity		$ 3,341,091	44.73%
Long-Term Debt			
Bonds and Notes[1]	3610536		
Liberty Term Facility[2]	168480		
Power Term Facility[2]	118684.8		
Total Long-Term Debt		$ 3,897,701	52.18%
Preferred Stock[3]		$ 231,254	3.10%
Short-Term Debt			
Revolving Credit Facilities	0		
Total Short-Term Debt		$ -	0.00%
Total Capitalization		**$ 7,470,046**	**100.00%**

Liberty Midstates
Case No. GR-2018-0013

Embedded Cost of Debt as of
September 30, 2017

Issuer:	Operations	Type	Security	Maturity	Debt (USD)	Variable Coupon	Fixed Coupon	Annual Int Exp (USD)
Liberty Utilites (America) Holdco Inc.	Holdco	Term Facility	Unsecured	5-Jul-19	$135,000,000	3.500%	0.000%	4,725,000
Calpeco	Utility	Notes	Unsecured	29-Dec-20	$ 45,000,000		5.190%	2,335,500
Calpeco	Utility	Notes	Unsecured	29-Dec-25	25,000,000		5.590%	1,397,500
Liberty Utilites (Sub) Co.	Utility	Notes	Unsecured	22-Dec-20	40,000,000		5.600%	2,240,000
New England Gas	Utility	First Mortgage	Secured	15-Feb-20	6,500,000		9.440%	613,600
New England Gas	Utility	First Mortgage	Secured	15-Sep-26	7,000,000		7.990%	559,300
New England Gas	Utility	First Mortgage	Secured	15-Dec-27	6,000,000		7.240%	434,400
Grantite State Electric	Utility	Notes	Unsecured	1-Nov-23	5,000,000		7.370%	368,500
Grantite State Electric	Utility	Notes	Unsecured	1-Jul-25	5,000,000		7.940%	397,000
Grantite State Electric	Utility	Notes	Unsecured	15-Jun-28	5,000,000		7.300%	365,000
Empire District Electric FMB	Utility	First Mortgage	Secured	1-Jun-18	90,000,000		6.375%	5,737,500
Empire District Electric FMB	Utility	First Mortgage	Secured	1-Jun-20	100,000,000		4.650%	4,650,000
Empire District Electric FMB	Utility	First Mortgage	Secured	2-Apr-27	88,000,000		3.580%	3,150,400
Empire District Electric FMB	Utility	First Mortgage	Secured	20-Aug-30	60,000,000		3.590%	2,154,000
Empire District Electric FMB	Utility	First Mortgage	Secured	30-May-33	30,000,000		3.730%	1,119,000
Empire District Electric FMB	Utility	First Mortgage	Secured	1-Apr-37	80,000,000		5.875%	4,700,000
Empire District Electric FMB	Utility	First Mortgage	Secured	1-Sep-40	50,000,000		5.200%	2,600,000
Empire District Electric FMB	Utility	First Mortgage	Secured	30-May-43	120,000,000		4.320%	5,184,000
Empire District Electric FMB	Utility	First Mortgage	Secured	1-Dec-44	60,000,000		4.270%	2,562,000
Empire Gas Company FMB	Utility	First Mortgage	Secured	1-Jun-36	55,000,000		6.820%	3,751,000
Empire District Electric Senior Notes	Utility	Notes	Unsecured	15-Nov-33	62,000,000		6.700%	4,154,000
Empire District Electric Senior Notes	Utility	Notes	Unsecured	1-Jul-35	40,000,000		5.800%	2,320,000
LU GP1 Series A	Utility	Notes	Unsecured	1-Aug-22	115,000,000		4.490%	5,163,500
LU GP1 Series A	Utility	Notes	Unsecured	30-Jul-27	60,000,000		4.890%	2,934,000
LU GP1 Series B	Utility	Notes	Unsecured	13-Mar-23	15,000,000		4.140%	621,000
LU GP1 Series C	Utility	Notes	Unsecured	31-Jul-20	25,000,000		3.230%	807,500
LU GP1 Series C	Utility	Notes	Unsecured	31-Jul-23	75,000,000		3.860%	2,895,000
LU GP1 Series C	Utility	Notes	Unsecured	31-Jul-28	25,000,000		4.260%	1,065,000
LU GP1 Series D	Utility	Notes	Unsecured	30-Apr-45	90,000,000	-	4.130%	3,717,000
LU GP1 Series D	Utility	Notes	Unsecured	15-Jul-45	70,000,000	-	4.130%	2,891,000
LU GP2 Series E	Utility	Notes	Unsecured	30-Apr-20	100,000,000	-	2.780%	2,780,000
LU GP2 Series E	Utility	Notes	Unsecured	30-Apr-22	80,000,000		3.300%	2,640,000
LU GP2 Series E	Utility	Notes	Unsecured	30-Apr-24	70,000,000		3.690%	2,583,000
LU GP2 Series E	Utility	Notes	Unsecured	30-Apr-27	250,000,000		3.940%	9,850,000
LU GP2 Series E	Utility	Notes	Unsecured	30-Apr-37	21,000,000		4.540%	953,400
LU GP2 Series E	Utility	Notes	Unsecured	30-Apr-47	229,000,000		4.890%	11,198,100
Total					**$ 2,339,500,000**			**105,616,200**
							Cost of Debt	**4.514%**

Note: Highlighted debt issuances are not shown on Liberty Utilities Company's Balance Sheet

Criteria for Selecting Comparable Local Gas Distribution Utility Companies

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SNL Financial Gas Utility Companies	Ticker	Stock Publicly Traded	At least 80% of Assets are Regulated	At Least 80% of Income from Regulated Utility Operations	No Reduced Dividend Since 2014	At Least Investment Grade Credit Rating (2 of 3 agencies)	Equity Analyst Long-Term CAGR EPS Estimate Available	No Pending Merger or Acquisition	**Comparable Company Met All Criteria**
Atmos Energy Corporation	**ATO**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Delta Natural Gas Company, Inc.		No	Yes	Yes	Yes	NR			
Gas Natural Inc.		No	No						
National Fuel Gas Company	NFG	Yes	No						
New Jersey Resources Corporation	NJR	Yes	No						
Northwest Natural Gas Company	**NWN**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
ONE Gas, Inc.	**OGS**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
RGC Resources, Inc.	RGCO	Yes	Yes	Yes	Yes	NR			
South Jersey Industries, Inc.	SJI	Yes	No						
Southwest Gas Holdings, Inc.	**SWX**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
Spire Inc.	**SR**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
WGL Holdings, Inc.	WGL	Yes	No						

Source: S&P Global Market Intelligence and SEC 10-Ks if additional information was needed for more detail.

NR = Not rated.

Comparable Natural Gas Distribution Companies
For Liberty Midstates

Number	Ticker Symbol	Company Name	S&P Corporate Credit Rating	Moody's Corporate Credit Rating
1	ATO	Atmos Energy Corporation.	A	A2
2	NWN	Northwest Natural Gas Company	A+	(P)A3
3	OGS	OneGas Inc.	A	A2
4	SWX	Southwest Gas Holdings, Inc.	BBB+	Baa1
5	SR	Spire Inc.	A-	Baa2
		Average	**A**	**A3**

Capital Structures for Proxy Companies as of September 30, 2017

(Including Short-Term Debt)

Capital Components	Atmos Energy	Northwest Natural Gas	One Gas Inc.	Southwest Gas Holdings	Spire Inc.
Common Equity	$3,898,666	$846,682	$1,931,992	$1,715,691	$1,991,300
Preferred Stock	$0	$0	$0	$0	$0
Long-term Debt[1]	$3,067,045	$779,424	$1,193,052	$1,760,434	$2,095,000
Short-term Debt	$447,745	$0	$174,000	$110,500	$477,300
Total	$7,413,456	$1,626,106	$3,299,044	$3,586,625	$4,563,600

Capital Structure	Atmos Energy	Northwest Natural Gas	One Gas Inc.	Southwest Gas Holdings	Spire Inc.	**Average for Proxy Group**
Common Equity	52.59%	52.07%	58.56%	47.84%	43.63%	50.94%
Preferred Stock	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-term Debt[1]	41.37%	47.93%	36.16%	49.08%	45.91%	44.09%
Short-term Debt	6.04%	0.00%	5.27%	3.08%	10.46%	4.97%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Capital Structures for Proxy Companies as of September 30, 2017

(Excluding Short-Term Debt)

Capital Components	Atmos Energy	Northwest Natural Gas	One Gas Inc.	Southwest Gas Holdings	Spire Inc.
Common Equity	$3,898,666	$846,682	$1,931,992	$1,715,691	$1,991,300
Preferred Stock	$0	$0	$0	$0	$0
Long-term Debt[1]	$3,067,045	$779,424	$1,193,052	$1,760,434	$2,095,000
Total	$6,965,711	$1,626,106	$3,125,044	$3,476,125	$4,086,300

Capital Structure	Atmos Energy	Northwest Natural Gas	One Gas Inc.	Southwest Gas Holdings	Spire Inc.	**Average for Proxy Group**
Common Equity	55.97%	52.07%	61.82%	49.36%	48.73%	53.59%
Preferred Stock	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-term Debt[1]	44.03%	47.93%	38.18%	50.64%	51.27%	46.41%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: S&P Global Market Intelligence

1. Long-term debt includes current maturities of long-term debt.

Liberty Midstates
Case No. GR-2018-0013

Dividends Per Share
for the Comparable Natural Gas Utility Companies

Company Name	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Atmos Energy Corporation	2.25	2.09	1.95	1.80	1.68	1.56	1.48	1.40	1.38	1.36	1.34	1.32	1.30	1.28	1.26	1.24
Northwest Natural Gas Company[1]	1.95	1.91	1.89	**1.88**	1.87	1.86	1.85	1.83	1.79	1.75	1.68	1.60	1.52	1.44	1.39	1.32
ONE Gas, Inc.[1,2]	2.08	1.98	1.83	**1.68**	1.40	1.20	0.84	--	--	--	--	--	--	--	--	--
Southwest Gas Holdings, Inc.[1]	2.41	2.30	2.13	**1.97**	1.80	1.62	1.46	1.32	1.18	1.06	1.00	0.95	0.90	0.86	1.03	0.82
Spire Inc.	2.48	2.38	2.26	2.10	1.96	1.84	1.76	1.70	1.66	1.62	1.58	1.54	1.50	1.46	1.41	1.38

	10-Year Historical	5-Year Historcal	3-Year Projected
Atmos Energy Corporation	2.92%	4.32%	7.73%
Northwest Natural Gas Company	3.07%	1.48%	1.18%
ONE Gas, Inc.	--	--	7.38%
Southwest Gas Holdings, Inc.	7.14%	10.72%	6.95%
Spire Inc.	3.35%	3.95%	5.70%
Average	**4.12%**	**5.12%**	**5.79%**

Notes:
1. Amounts in 2017 are in bold because they are estimates.
2. One Gas completed spinoff in 2014.

Liberty Midstates
Case No. GR-2018-0013

Earnings Per Share
for the Comparable Natrual Gas Utility Companies

Company Name	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Atmos Energy Corporation	4.53	4.17	3.97	3.60	3.33	3.00	2.96	2.54	2.12	2.08	2.14	2.08	2.00	1.94	1.83	1.73
Northwest Natural Gas Company[1]	2.60	2.48	2.27	**2.18**	2.13	1.96	2.16	2.24	2.19	2.36	2.73	2.83	2.63	2.78	2.30	2.11
ONE Gas, Inc.[1,2]	3.55	3.26	3.13	**3.08**	2.67	2.26	2.10	1.90	--	--	--	--	--	--	--	
Southwest Gas Holdings, Inc.[1]	3.87	3.69	3.60	**3.43**	3.20	2.94	3.04	3.14	2.89	2.45	2.29	1.95	1.40	1.97	2.07	1.15
Spire Inc.	3.83	3.76	3.69	3.44	3.26	3.16	2.36	2.03	2.80	2.87	2.43	2.90	2.64	2.13	2.31	1.90

	10-Year Historical	5-Year Historcal	3-Year Projected
Atmos Energy Corporation	6.09%	9.39%	7.99%
Northwest Natural Gas Company	-1.36%	-2.94%	6.06%
ONE Gas, Inc.	--	--	4.83%
Southwest Gas Holdings, Inc.	6.31%	4.63%	4.11%
Spire Inc.	4.52%	4.01%	3.63%
Average	**3.89%**	**3.77%**	**5.32%**

Notes:
1. Amounts in 2017 are in bold because they are estimates.
2. One Gas completed spinoff in 2014.

Liberty Midstates
Case No. GR-2018-0013

Book Value Per Share
for the Comparable Natrual Gas Utility Companies

Company Name	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Atmos Energy Corporation	49.76	45.19	42.96	36.74	33.32	31.48	30.74	28.47	26.14	24.98	24.16	23.52	22.60	22.01	20.16	19.90
Northwest Natural Gas Company[1]	31.63	33.17	32.11	**31.30**	29.71	28.47	28.12	27.77	27.11	26.62	25.99	24.88	23.71	22.52	21.97	21.28
ONE Gas, Inc.[1,2]	41.84	39.57	38.24	**36.93**	36.12	35.24	34.45	--	--	--	--	--	--	--	--	--
Southwest Gas Holdings, Inc.[1]	--	41.70	39.65	**36.79**	35.03	33.65	32.00	30.51	28.39	26.68	25.60	24.44	23.49	22.98	21.58	19.10
Spire Inc.	46.25	45.03	43.56	41.26	38.73	36.31	34.93	32.00	26.69	25.56	24.02	23.32	22.12	19.79	18.85	17.31

	10-Year Historical	5-Year Historcal	3-Year Projected
Atmos Energy Corporation	5.05%	6.17%	10.64%
Northwest Natural Gas Company	3.13%	2.34%	0.35%
ONE Gas, Inc.	--	--	4.25%
Southwest Gas Holdings, Inc.	5.18%	5.51%	--
Spire Inc.	7.59%	8.80%	3.88%
Average	**5.24%**	**5.70%**	**4.78%**

Notes:
1. Amounts in 2017 are in bold because they are estimates.
2. One Gas completed spinoff in 2014.

Historical and Projected Growth Rates for the Comparable Natural Gas Utility Companies

Company Name	(1) 10-Year Historical Growth Rate (DPS, EPS and BVPS)	(2) 5-Year Hisotrical Growth Rate (DPS, EPS and BVPS)	(3) Projected 5-Year EPS Growth S&P CIQ (Mean) (%)
Atmos Energy Corporation	4.68%	6.62%	7.00%
Northwest Natural Gas Company	1.61%	0.29%	4.67%
ONE Gas, Inc.	--	--	5.00%
Southwest Gas Holdings, Inc.	6.21%	6.95%	4.00%
Spire Inc.	5.15%	5.59%	4.25%
Average	**4.41%**	**4.86%**	**4.98%**

Sources: Column 1 = DPS, EPS, BVPS -- 10 & 5 yr Historical Growth

Column 2 = DPS, EPS, BVPS -- 10 & 5 yr Historical Growth

Column 3 = S&P Global Market Intelligence as of February 6, 2018

Liberty Midstates
Case No. GR-2018-0013

Long-Term Gas Proxy Group
DPS, EPS, BVPS & GDP
10-Year Compound Growth Rate Averages (1968-2016)

DPS		*EPS*		*BVPS*		Average	GDP		CSPS	
Years	10 yr compound growth rate avgs	Years	10 yr compound growth rate avgs	Years	10 yr compound growth rate avgs	DPS, EPS and BVPS	Years	10 yr compound growth rate avgs	Years	10 yr compound growth rate avgs
1968-70 to 1978-80	3.82%	1968-70 to 1978-80	5.16%	1968-70 to 1978-80	4.59%	4.52%	1968-70 to 1978-80	9.96%	1968-70 to 1978-80	3.30%
1969-71 to 1979-81	4.13%	1969-71 to 1979-81	5.07%	1969-71 to 1979-81	4.62%	4.61%	1969-71 to 1979-81	10.31%	1969-71 to 1979-81	4.76%
1970-72 to 1980-82	4.69%	1970-72 to 1980-82	4.75%	1970-72 to 1980-82	4.51%	4.65%	1970-72 to 1980-82	10.32%	1970-72 to 1980-82	4.85%
1971-73 to 1981-83	5.10%	1971-73 to 1981-83	4.10%	1971-73 to 1981-83	4.30%	4.50%	1971-73 to 1981-83	10.15%	1971-73 to 1981-83	3.90%
1972-74 to 1982-84	5.50%	1972-74 to 1982-84	5.20%	1972-74 to 1982-84	4.11%	4.94%	1972-74 to 1982-84	9.98%	1972-74 to 1982-84	5.06%
1973-75 to 1983-85	5.98%	1973-75 to 1983-85	5.87%	1973-75 to 1983-85	4.08%	5.31%	1973-75 to 1983-85	9.93%	1973-75 to 1983-85	7.35%
1974-76 to 1984-86	6.51%	1974-76 to 1984-86	5.91%	1974-76 to 1984-86	4.11%	5.51%	1974-76 to 1984-86	9.76%	1974-76 to 1984-86	9.67%
1975-77 to 1985-87	6.91%	1975-77 to 1985-87	5.28%	1975-77 to 1985-87	4.15%	5.44%	1975-77 to 1985-87	9.34%	1975-77 to 1985-87	10.74%
1976-78 to 1986-88	6.99%	1976-78 to 1986-88	5.37%	1976-78 to 1986-88	4.24%	5.54%	1976-78 to 1986-88	8.82%	1976-78 to 1986-88	9.61%
1977-79 to 1987-89	7.06%	1977-79 to 1987-89	5.07%	1977-79 to 1987-89	4.23%	5.45%	1977-79 to 1987-89	8.35%	1977-79 to 1987-89	8.22%
1978-80 to 1988-90	6.79%	1978-80 to 1988-90	3.85%	1978-80 to 1988-90	4.16%	4.93%	1978-80 to 1988-90	7.96%	1978-80 to 1988-90	6.28%
1979-81 to 1989-91	6.37%	1979-81 to 1989-91	2.39%	1979-81 to 1989-91	3.81%	4.19%	1979-81 to 1989-91	7.42%	1979-81 to 1989-91	4.20%
1980-82 to 1990-92	5.72%	1980-82 to 1990-92	2.16%	1980-82 to 1990-92	3.66%	3.85%	1980-82 to 1990-92	7.10%	1980-82 to 1990-92	3.07%
1981-83 to 1991-93	5.23%	1981-83 to 1991-93	2.86%	1981-83 to 1991-93	3.63%	3.91%	1981-83 to 1991-93	6.75%	1981-83 to 1991-93	3.21%
1982-84 to 1992-94	5.04%	1982-84 to 1992-94	2.59%	1982-84 to 1992-94	3.98%	3.87%	1982-84 to 1992-94	6.52%	1982-84 to 1992-94	4.02%
1983-85 to 1993-95	4.40%	1983-85 to 1993-95	2.36%	1983-85 to 1993-95	3.93%	3.56%	1983-85 to 1993-95	6.15%	1983-85 to 1993-95	3.46%
1984-86 to 1994-96	3.75%	1984-86 to 1994-96	2.94%	1984-86 to 1994-96	3.91%	3.53%	1984-86 to 1994-96	5.92%	1984-86 to 1994-96	1.91%
1985-87 to 1995-97	3.39%	1985-87 to 1995-97	3.94%	1985-87 to 1995-97	3.92%	3.75%	1985-87 to 1995-97	5.85%	1985-87 to 1995-97	1.52%
1986-88 to 1996-98	3.02%	1986-88 to 1996-98	3.44%	1986-88 to 1996-98	3.61%	3.36%	1986-88 to 1996-98	5.78%	1986-88 to 1996-98	0.98%
1987-89 to 1997-99	2.71%	1987-89 to 1997-99	2.29%	1987-89 to 1997-99	3.25%	2.75%	1987-89 to 1997-99	5.66%	1987-89 to 1997-99	0.64%
1988-90 to 1998-00	2.44%	1988-90 to 1998-00	2.27%	1988-90 to 1998-00	3.16%	2.63%	1988-90 to 1998-00	5.57%	1988-90 to 1998-00	0.15%
1989-91 to 1999-01	2.19%	1989-91 to 1999-01	4.07%	1989-91 to 1999-01	3.46%	3.24%	1989-91 to 1999-01	5.55%	1989-91 to 1999-01	-0.16%
1990-92 to 2000-02	2.07%	1990-92 to 2000-02	4.73%	1990-92 to 2000-02	3.67%	3.49%	1990-92 to 2000-02	5.48%	1990-92 to 2000-02	-0.03%
1991-93 to 2001-03	2.01%	1991-93 to 2001-03	4.89%	1991-93 to 2001-03	4.03%	3.64%	1991-93 to 2001-03	5.39%	1991-93 to 2001-03	0.30%
1992-94 to 2002-04	2.05%	1992-94 to 2002-04	4.50%	1992-94 to 2002-04	4.48%	3.68%	1992-94 to 2002-04	5.31%	1992-94 to 2002-04	0.75%
1993-95 to 2003-05	2.19%	1993-95 to 2003-05	5.00%	1993-95 to 2003-05	4.98%	4.06%	1993-95 to 2003-05	5.37%	1993-95 to 2003-05	1.05%
1994-96 to 2004-06	2.42%	1994-96 to 2004-06	5.08%	1994-96 to 2004-06	5.41%	4.30%	1994-96 to 2004-06	5.45%	1994-96 to 2004-06	1.61%
1995-97 to 2005-07	2.66%	1995-97 to 2005-07	4.84%	1995-97 to 2005-07	5.69%	4.40%	1995-97 to 2005-07	5.45%	1995-97 to 2005-07	1.55%
1996-98 to 2006-08	2.91%	1996-98 to 2006-08	5.35%	1996-98 to 2006-08	5.98%	4.75%	1996-98 to 2006-08	5.25%	1996-98 to 2006-08	1.47%
1997-99 to 2007-09	3.18%	1997-99 to 2007-09	6.29%	1997-99 to 2007-09	6.18%	5.22%	1997-99 to 2007-09	4.77%	1997-99 to 2007-09	1.80%
1998-00 to 2008-10	3.47%	1998-00 to 2008-10	6.81%	1998-00 to 2008-10	6.23%	5.50%	1998-00 to 2008-10	4.27%	1998-00 to 2008-10	3.56%
1999-01 to 2009-11	3.78%	1999-01 to 2009-11	6.28%	1999-01 to 2009-11	6.25%	5.43%	1999-01 to 2009-11	3.92%	1999-01 to 2009-11	4.97%
2000-02 to 2010-12	4.02%	2000-02 to 2010-12	5.75%	2000-02 to 2010-12	6.29%	5.35%	2000-02 to 2010-12	3.88%	2000-02 to 2010-12	7.07%
2001-03 to 2011-13	4.08%	2001-03 to 2011-13	4.56%	2001-03 to 2011-13	5.98%	4.87%	2001-03 to 2011-13	3.86%	2001-03 to 2011-13	8.22%
2002-04 to 2012-14	4.28%	2002-04 to 2012-14	4.37%	2002-04 to 2012-14	5.89%	4.85%	2002-04 to 2012-14	3.75%	2002-04 to 2012-14	8.81%
2003-05 to 2013-15	4.44%	2003-05 to 2013-15	3.74%	2003-05 to 2013-15	5.80%	4.66%	2003-05 to 2013-15	3.52%	2003-05 to 2013-15	9.57%
2004-06 to 2014-16	4.57%	2004-06 to 2014-16	3.83%	2004-06 to 2014-16	5.56%	4.65%	2004-06 to 2014-16	3.25%	2004-06 to 2014-16	9.48%
Average	**4.21%**	**Average**	**4.40%**	**Average**	**4.59%**	**4.40%**	**Average**	**6.54%**	**Average**	**4.24%**

Average of 10-year Rolling Averages EPS, DPS and BVPS **4.40%**

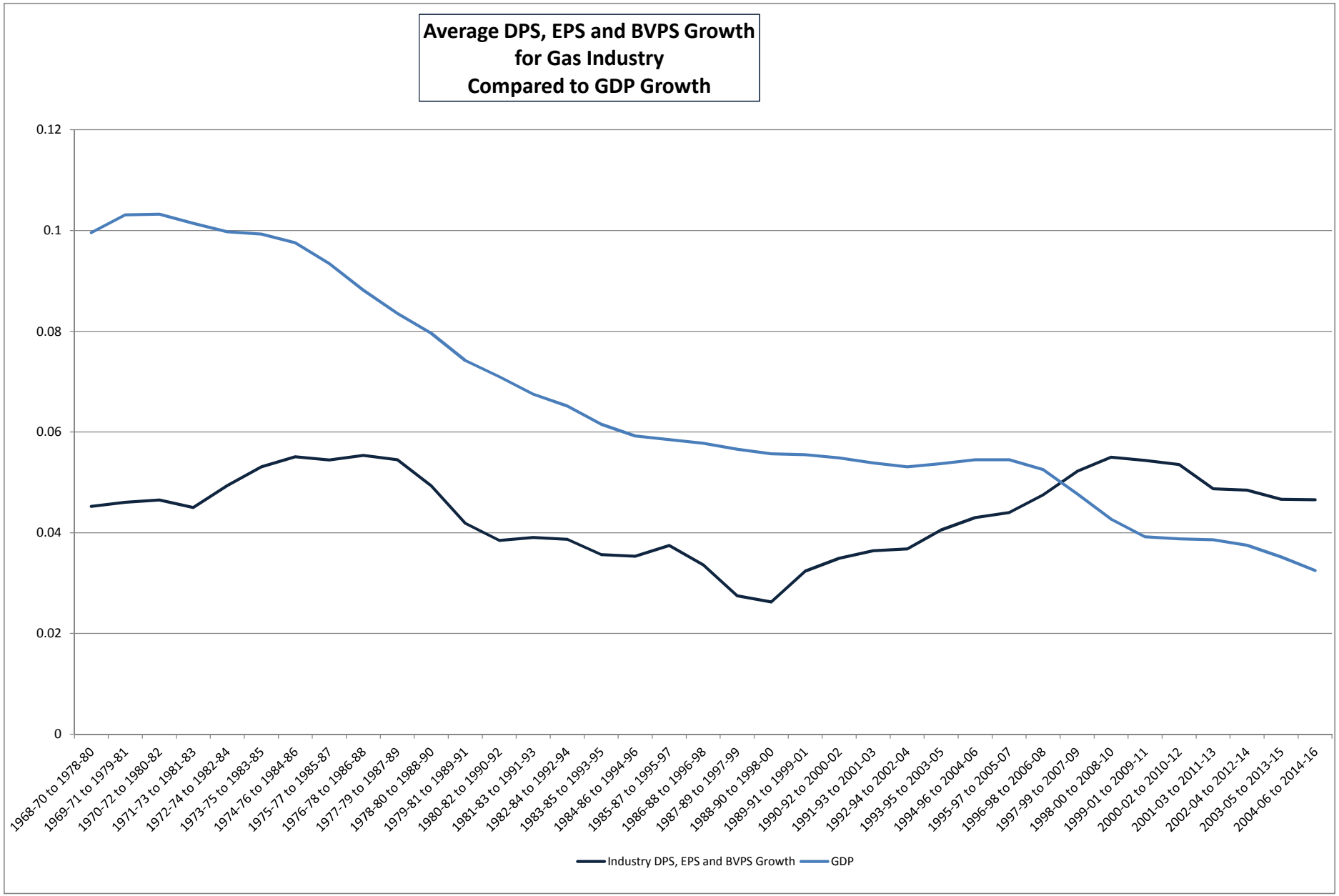
Source: Value Line Investment Survey

Long-Term Gas Proxy Group Excluding Atmos
DPS, EPS, BVPS & GDP
10-Year Compound Growth Rate Averages (1968-2016)

DPS		*EPS*		*BVPS*		Average	GDP	
Years	10 yr compound growth rate avgs	Years	10 yr compound growth rate avgs	Years	10 yr compound growth rate avgs	DPS, EPS and BVPS	Years	10 yr compound growth rate avgs
1968-70 to 1978-80	3.27%	1968-70 to 1978-80	5.16%	1968-70 to 1978-80	4.59%	4.34%	1968-70 to 1978-80	9.96%
1969-71 to 1979-81	3.54%	1969-71 to 1979-81	5.07%	1969-71 to 1979-81	4.62%	4.41%	1969-71 to 1979-81	10.31%
1970-72 to 1980-82	4.02%	1970-72 to 1980-82	4.75%	1970-72 to 1980-82	4.51%	4.43%	1970-72 to 1980-82	10.32%
1971-73 to 1981-83	4.37%	1971-73 to 1981-83	4.10%	1971-73 to 1981-83	4.30%	4.26%	1971-73 to 1981-83	10.15%
1972-74 to 1982-84	4.71%	1972-74 to 1982-84	5.20%	1972-74 to 1982-84	4.11%	4.67%	1972-74 to 1982-84	9.98%
1973-75 to 1983-85	5.12%	1973-75 to 1983-85	5.87%	1973-75 to 1983-85	4.08%	5.02%	1973-75 to 1983-85	9.93%
1974-76 to 1984-86	5.69%	1974-76 to 1984-86	5.91%	1974-76 to 1984-86	4.11%	5.24%	1974-76 to 1984-86	9.76%
1975-77 to 1985-87	6.05%	1975-77 to 1985-87	5.28%	1975-77 to 1985-87	4.15%	5.16%	1975-77 to 1985-87	9.34%
1976-78 to 1986-88	6.12%	1976-78 to 1986-88	5.37%	1976-78 to 1986-88	4.24%	5.24%	1976-78 to 1986-88	8.82%
1977-79 to 1987-89	6.18%	1977-79 to 1987-89	5.07%	1977-79 to 1987-89	4.23%	5.16%	1977-79 to 1987-89	8.35%
1978-80 to 1988-90	5.94%	1978-80 to 1988-90	3.85%	1978-80 to 1988-90	4.16%	4.65%	1978-80 to 1988-90	7.96%
1979-81 to 1989-91	5.57%	1979-81 to 1989-91	2.39%	1979-81 to 1989-91	3.81%	3.92%	1979-81 to 1989-91	7.42%
1980-82 to 1990-92	5.00%	1980-82 to 1990-92	2.16%	1980-82 to 1990-92	3.66%	3.61%	1980-82 to 1990-92	7.10%
1981-83 to 1991-93	4.57%	1981-83 to 1991-93	2.86%	1981-83 to 1991-93	3.63%	3.69%	1981-83 to 1991-93	6.75%
1982-84 to 1992-94	4.41%	1982-84 to 1992-94	2.59%	1982-84 to 1992-94	3.98%	3.66%	1982-84 to 1992-94	6.52%
1983-85 to 1993-95	3.85%	1983-85 to 1993-95	2.36%	1983-85 to 1993-95	3.93%	3.38%	1983-85 to 1993-95	6.15%
1984-86 to 1994-96	3.28%	1984-86 to 1994-96	2.94%	1984-86 to 1994-96	3.91%	3.38%	1984-86 to 1994-96	5.92%
1985-87 to 1995-97	2.84%	1985-87 to 1995-97	3.93%	1985-87 to 1995-97	3.80%	3.52%	1985-87 to 1995-97	5.85%
1986-88 to 1996-98	2.50%	1986-88 to 1996-98	3.30%	1986-88 to 1996-98	3.49%	3.09%	1986-88 to 1996-98	5.78%
1987-89 to 1997-99	2.18%	1987-89 to 1997-99	2.34%	1987-89 to 1997-99	3.14%	2.55%	1987-89 to 1997-99	5.66%
1988-90 to 1998-00	1.92%	1988-90 to 1998-00	2.48%	1988-90 to 1998-00	3.09%	2.50%	1988-90 to 1998-00	5.57%
1989-91 to 1999-01	1.71%	1989-91 to 1999-01	4.34%	1989-91 to 1999-01	3.38%	3.14%	1989-91 to 1999-01	5.55%
1990-92 to 2000-02	1.60%	1990-92 to 2000-02	4.88%	1990-92 to 2000-02	3.59%	3.36%	1990-92 to 2000-02	5.48%
1991-93 to 2001-03	1.56%	1991-93 to 2001-03	4.93%	1991-93 to 2001-03	3.91%	3.47%	1991-93 to 2001-03	5.39%
1992-94 to 2002-04	1.62%	1992-94 to 2002-04	4.54%	1992-94 to 2002-04	4.35%	3.50%	1992-94 to 2002-04	5.31%
1993-95 to 2003-05	1.78%	1993-95 to 2003-05	5.14%	1993-95 to 2003-05	4.79%	3.90%	1993-95 to 2003-05	5.37%
1994-96 to 2004-06	2.04%	1994-96 to 2004-06	5.28%	1994-96 to 2004-06	5.24%	4.19%	1994-96 to 2004-06	5.45%
1995-97 to 2005-07	2.32%	1995-97 to 2005-07	5.06%	1995-97 to 2005-07	5.52%	4.30%	1995-97 to 2005-07	5.45%
1996-98 to 2006-08	2.61%	1996-98 to 2006-08	5.78%	1996-98 to 2006-08	5.89%	4.76%	1996-98 to 2006-08	5.25%
1997-99 to 2007-09	2.91%	1997-99 to 2007-09	6.62%	1997-99 to 2007-09	6.10%	5.21%	1997-99 to 2007-09	4.77%
1998-00 to 2008-10	3.24%	1998-00 to 2008-10	7.03%	1998-00 to 2008-10	6.16%	5.47%	1998-00 to 2008-10	4.27%
1999-01 to 2009-11	3.56%	1999-01 to 2009-11	6.21%	1999-01 to 2009-11	6.21%	5.33%	1999-01 to 2009-11	3.92%
2000-02 to 2010-12	3.82%	2000-02 to 2010-12	5.83%	2000-02 to 2010-12	6.27%	5.31%	2000-02 to 2010-12	3.88%
2001-03 to 2011-13	3.85%	2001-03 to 2011-13	4.64%	2001-03 to 2011-13	5.98%	4.83%	2001-03 to 2011-13	3.86%
2002-04 to 2012-14	4.04%	2002-04 to 2012-14	4.32%	2002-04 to 2012-14	5.90%	4.75%	2002-04 to 2012-14	3.75%
2003-05 to 2013-15	4.17%	2003-05 to 2013-15	3.51%	2003-05 to 2013-15	5.90%	4.53%	2003-05 to 2013-15	3.52%
2004-06 to 2014-16	4.22%	2004-06 to 2014-16	3.56%	2004-06 to 2014-16	5.64%	4.47%	2004-06 to 2014-16	3.25%
Average	**3.68%**	**Average**	**4.45%**	**Average**	**4.55%**	**4.23%**	**Average**	**6.54%**

Average of 10-year Rolling Averages EPS, DPS and BVPS **4.23%**

Source: Value Line Investment Survey


Average DPS, EPS and BVPS Growth
for Gas Industry
Compared to GDP Growth
0.12
0.1
0.08
0.06
0.04
0.02
0
1968-70 to 1978-80
1969-71 to 1979-81
1970-72 to 1980-82
1971-73 to 1981-83
1972-74 to 1982-84
1973-75 to 1983-85
1974-76 to 1984-86
1975-77 to 1985-87
1976-78 to 1986-88
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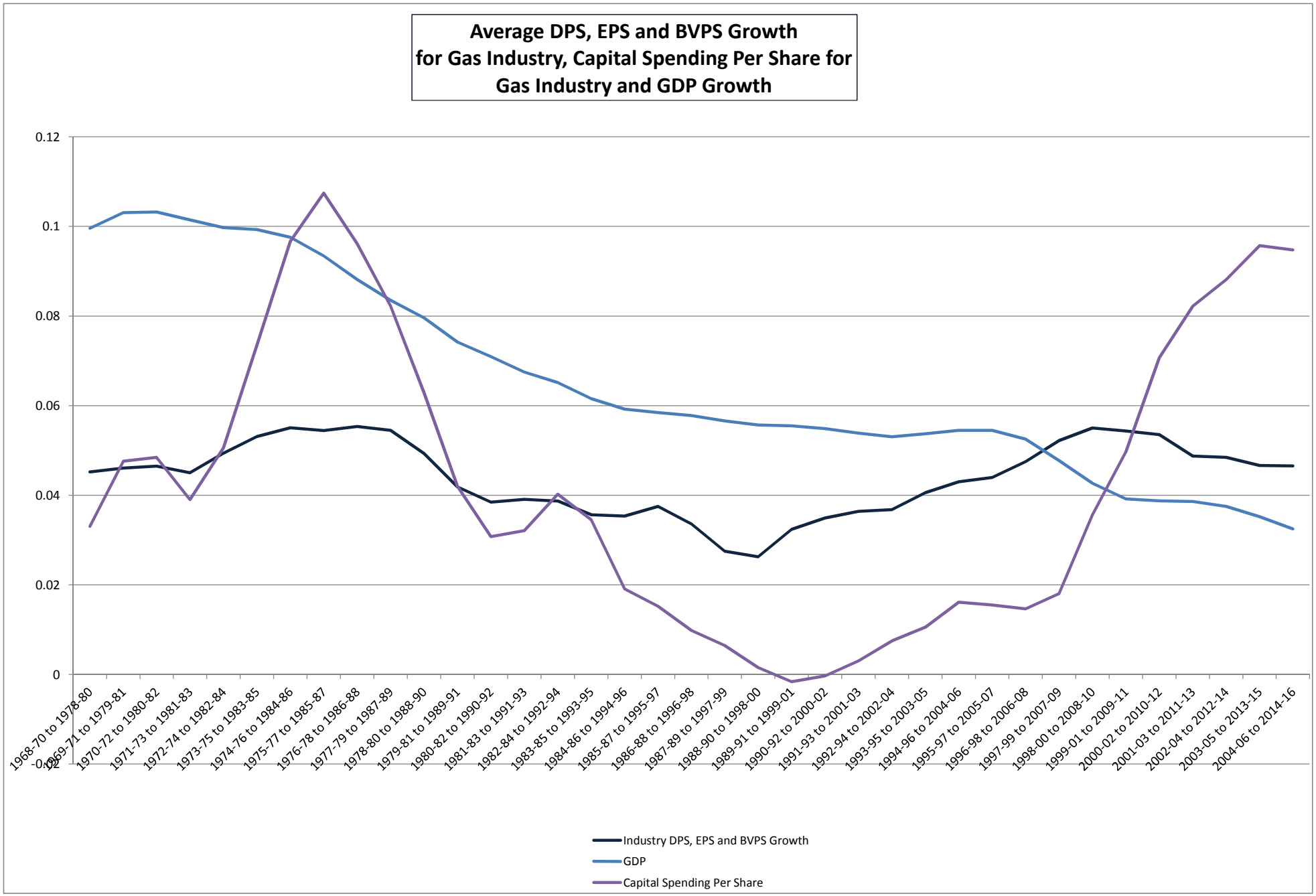
1996-98 to 2006-08
1997-99 to 2007-09
1998-00 to 2008-10
1999-01 to 2009-11
2000-02 to 2010-12
2001-03 to 2011-13
2002-04 to 2012-14
2003-05 to 2013-15
2004-06 to 2014-16
Industry DPS, EPS and BVPS Growth
GDP

Liberty Midstates
Case No. GR-2018-0013



SCHEDULE 10-8

Constant-Growth Discounted Cash Flow (DCF) Estimated Costs of Common Equity for the Comparable Natural Gas Utility Companies

Company Name	(1) Expected Annual Dividend	(2) Average 3-Month Stock Price	(3) Average 2-Month Stock Price	(4) 3-Month Dividend Yield	(5) 2-Month Dividend Yield
Atmos Energy Corporation	$1.98	$86.651	$85.338	2.29%	2.32%
Northwest Natural Gas Company	$1.89	$62.683	$60.489	3.02%	3.13%
ONE Gas, Inc.	$1.83	$74.212	$72.751	2.47%	2.52%
Southwest Gas Holdings, Inc.	$2.14	$80.008	$78.845	2.67%	2.71%
Spire Inc.	$2.27	$75.226	$73.400	3.02%	3.09%
Average				**2.69%**	**2.75%**

Proposed Dividend Yield:	**2.70%**
Proposed Range of Growth:	**4.20% - 5.00%**
Estimated Proxy Cost of Common Equity:	**6.90% - 7.70%**

Notes: Column 1 = Expected Annual Dividend based on the sume of equity analysts' expected next four quarters of DPS.
Column 4 = (Column 1 / Column 2).
Column 5 = (Column 1 / Column 3).

Sources: Columns 1, 2, and 3 = S&P Global Market Intelligence

SCHEDULE 11

Liberty Midstates
Case No. GR-2018-0013

Capital Asset Pricing Model (CAPM) Costs of Common Equity Estimates
for the Comparable Natural Gas Distribution Companies

	(1)	(2)	(3)	(4)	(5)	(6)
Company Name	Risk Free Rate	Company's Beta	Arithmetic Average Market Risk Premium (1926-2016)	Geometric Average Market Risk Premium (1926-2016)	Arithmetic CAPM Cost of Common Equity (1926-2016)	Geometric CAPM Cost of Common Equity (1926-2016)
Atmos Energy Corporation	2.82%	0.71	6.00%	4.50%	7.05%	5.99%
Northwest Natural Gas Company	2.82%	0.62	6.00%	4.50%	6.56%	5.63%
ONE Gas, Inc.	2.82%	0.72	6.00%	4.50%	7.13%	6.05%
Southwest Gas Holdings, Inc.	2.82%	0.74	6.00%	4.50%	7.25%	6.14%
Spire Inc.	2.82%	0.62	6.00%	4.50%	6.56%	5.63%
Average		**0.68**			**6.91%**	**5.89%**

Sources:

Column 1 = The appropriate yield is equal to the average 30-year U.S. Treasury Bond yield for November - December 2017, and Janaury 2018 which was obtained fr St. Louis Federal Reserve website at http://research.stlouisfed.org/fred2/series/GS30/22

Column 2 = Beta is a measure of the movement and relative risk of an individual stock to the market as a whole generate by the MI Beta Stock Generator January 31, 2013 through January 31, 2018 .

Column 3 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2016 was determined to be 6.00% based on an arithmetic average as calculated in Valuation Handbook by Duff & Phelps.

Column 4 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2016 was determined to be 4.50% based on a geometric average as calculated in Valuation Handbook by Duff & Phelps.

Column 5 = (Column 1 + (Column 2 * Column 3)).

Column 6 = (Column 1 + (Column 2 * Column 4)).

Weighted Rate of Return
for Liberty Midstates

Liberty Utilities Company Adjusted Actual Capital Structure

as of 9/30/2017

Capital Component	Percentage of Capital	Cost	Weighted Rate of Return Using Return on Common Equity of: 9.50%	9.75%	**10.00%**
Common Stock Equity	40.94%	-----	3.89%	3.99%	**4.09%**
Long-Term Debt	59.06%	4.51%	2.67%	2.67%	**2.67%**
Short-Term Debt	0.00%	0.00%	0.00%	0.00%	**0.00%**
	100.00%		6.56%	6.66%	**6.76%**

Liberty Utilities Company's Targeted Capital Structure (Low End)

Capital Component	Percentage of Capital	Cost	Weighted Rate of Return Using Return on Common Equity of: 9.50%	9.75%	10.00%
Common Stock Equity	45.00%	-----	4.28%	4.39%	4.50%
Long-Term Debt	55.00%	4.51%	2.48%	2.48%	2.48%
Short-Term Debt	0.00%	0.00%	0.00%	0.00%	0.00%
	100.00%		6.76%	6.87%	6.98%

SCHEDULE 13

SCHEDULE 14

HAS BEEN DEEMED

CONFIDENTIAL

IN ITS ENTIRETY