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MISSOURI PUBLIC SERVICE COMMISSION
FINANCIAL AND BUSINESS ANALYSIS DIVISION
FINANCIAL ANALYSIS DEPARTMENT

DIRECT TESTIMONY
Revenue Requirement

OF

SEOUNG JOUN WON, PhD

SPIRE MISSOURI, INC., d/b/a Spire

CASE NO. GR-2022-0179

Jefferson City, Missouri
August 2022

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SEOUNG JOUN WON, PhD
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1 of my educational background and occupational experience appears in Appendix 1, attached to
2 this Direct Testimony.

3 Q. Have you previously filed testimony before the Commission?

4 A. Yes, I have appeared previously before the Commission. I have testified on rate
5 of return (“ROR”), cost of capital, capital structure, finance issuance, feasibility analysis,
6 valuation analysis on mergers and acquisitions etc. Please refer to Appendix 1, attached to this
7 Direct Testimony, for a list of my testimony, recommendations, or memorandums previously
8 filed with the Commission and the associated issues.

9 Q. On behalf of whom are you testifying in this proceeding?

10 A. I am testifying in this Direct Testimony before the Commission on behalf of the
11 Missouri Public Service Commission Staff (“Staff”).

12 Q. What is the purpose of your direct testimony?

13 A. In this testimony, Staff presents evidence and provides a recommendation
14 regarding the appropriate ROR to be used in establishing the natural gas service rates
15 of Spire Missouri, Inc. (“Spire Missouri” or the “Company”), a subsidiary of Spire, Inc.
16 (“Spire” or the “parent Company”).

17 Staff’s analyses and conclusions are supported by the data presented in
18 Schedules SJW-d1 through SJW-d17 contained within Appendix 2. Staff’s workpapers will be
19 provided to the parties at the time of the filing of this Direct Testimony. Staff will make any
20 additional source documents of specific interest available upon the request of any party to this
21 case or the Commission.

1 **I. EXECUTIVE SUMMARY**

2 Q. Please provide a summary of your methodology and findings concerning the
3 ROR that should be utilized in setting rates for Spire Missouri’s natural gas utility operations
4 in this proceeding.

5 A. Staff estimated the market-based cost of common equity (“COE”) for Spire
6 Missouri using a comparative COE analysis. Staff’s analysis takes into account changes in
7 economic and capital market conditions over time by employing two widely-used and
8 well-respected COE estimation methodologies: the discounted cash flow model (“DCF”) and
9 the capital asset pricing model (“CAPM”).¹ The comparative COE analysis method allowed
10 Staff to calculate the change in authorized return on equity (“ROE”) based on the change in its
11 COE estimate from period to period by using the Commission’s most recent decision. The
12 Commission’s most recent, fully-litigated natural gas rate case is Spire Missouri’s rate case,
13 Case No. GR-2021-0108, in 2021 (“2021 Spire Case”).² By using the decision made by the
14 Commission in the 2021 Spire Case as a benchmark, Staff calculated a reasonable range of
15 authorized ROEs and a recommended ROE.³

16 Staff also considered the current economic and financial market conditions when
17 recommending an ROE. The current utility COE estimates are unusually and unsustainably
18 high due to the effects of the coronavirus pandemic (“COVID-19”). When COVID-19 hit in
19 2020, it caused massive volatility in the financial markets.⁴ Gross domestic product (“GDP”)

¹ *Ass’n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.*, Opinion No. 569, 169 FERC ¶ 61,129 (2019).

² In the most recent Spire Missouri general rate case, Case No. GR-2021-0108, the Commission set the authorized ROE at 9.37% for ratemaking purposes.

³ COE is the return required by investors; ROE is the return set by a regulatory utility commission. Although some experts contend that COE and ROE are synonymous, Staff’s position is that they need not be. Observed utility COEs have been generally significantly lower than ROEs in recent years.

⁴ Federal Reserve Economic Data, retrieved March 23, 2022, <https://fred.stlouisfed.org/series/VIXCLS>.

1 fell sharply, followed by an equally sharp recovery through 2021.⁵ The recovery from the
2 COVID-19 pandemic spurred fears of higher inflation and, consequently, higher market risk.⁶
3 Inflation fears increased market risk for utilities as investors believed that regulators would
4 not adjust revenues fast enough to compensate for the rising input costs.⁷ Additionally, in
5 June 2022, the consumer price index soared at an annual rate of 9.1%, a new 40-year high driven
6 by increases in the cost of energy, mainly due to a 98% increase in fuel oil prices.⁸ Staff still
7 agrees with the Federal Reserve (“Fed”) that the current risk assessment could project a higher
8 inflation than will actually happen in the future because of uncertainty of risks such as ongoing
9 supply bottlenecks and rising energy and commodity prices, both of which were exacerbated
10 by the Russian invasion of Ukraine.⁹

11 Q. Please summarize the result of your comparative COE analysis and
12 recommended ROR.

13 A. In the *Amended Report and Order* of the 2021 Spire Case issued on
14 November 12, 2021, the Commission found that a 9.37% ROE was fair and reasonable for
15 calculating the revenue requirement for Spire Missouri.¹⁰ For the current rate case, Staff
16 recommends that the Commission set Spire Missouri’s authorized ROE at 9.58%, the midpoint
17 of a reasonable range of 9.33% and 9.83%.¹¹ Staff considered the current high inflation rate
18 and the expected rise in interest rates in making these recommendations. Staff’s recommended

⁵ Bureau of Economic Analysis, U.S. Department of Commerce, retrieved May 25, 2022,
<https://www.bea.gov/news/2022/gross-domestic-product-first-quarter-2022-advance-estimate>.

⁶ S&P Global, Markets in Motion, retrieved March 23, 2022,
<https://www.spglobal.com/en/research-insights/featured/inflation>.

⁷ Hartford Funds, Insight, Which Equity Sectors Can Combat Higher Inflation?, retrieved March 23, 2022,
<https://www.hartfordfunds.com/dam/en/docs/pub/whitepapers/WP597.pdf>.

⁸ Bureau of Labor Statistics, Consumer Price Index, <https://www.bls.gov/cpi/>

⁹ Federal Reserve issues Federal Open Market Committee (FOMC) statement, published April 6, 2022, and,
retrieved April 23, 2022, <https://www.federalreserve.gov/monetarypolicy/fomcminutes20220316.htm>.

¹⁰ On page 97, *Amended Report and Order* issued November 12, 2021, in Case No. GR-2021-0108.

¹¹ Schedule SJW-d16, Won’s Direct Testimony.

1 authorized ROE based on natural gas utilities' COE estimates rose by approximately 21 basis
2 points since the period of the 2021 Spire Case.¹² Staff's recommendation of a 9.58% authorized
3 ROE will fairly compensate Spire Missouri for its current market COE and balance the interests
4 of all stakeholders, particularly considering that the current market COE estimates for
5 Spire Missouri are presently in the range of 7.51% to 9.00%.¹³

6 Staff also recommends that the Commission use Spire Missouri's own actual capital
7 structure of 51.87% common equity and 48.13% long-term debt as of June 30, 2022, for
8 purposes of setting Spire Missouri's ROR in this proceeding.¹⁴ Among other reasons,
9 Spire Missouri's standalone capital structure is the appropriate capital structure for use in this
10 proceeding because Spire Missouri has an independently determined capital structure in that its
11 debt is secured by its own assets and not the assets of its parent company, Spire, Inc., or any of
12 Spire, Inc.'s other subsidiaries.¹⁵ Additionally, Spire Missouri's stand-alone capital structure
13 supports its own bond rating.¹⁶ Consistent with Staff's capital structure recommendation, Staff
14 also recommends at this time that the Commission use a cost of debt value of 4.005%, resulting
15 in the overall midpoint ROR of 6.90%, taken from the calculated range of 6.77% to 7.03%.¹⁷

16 Q. Please explain how your direct testimony is organized.

17 A. Staff's testimony is organized into five sections. First, Staff discusses the
18 applicable regulatory principles concerning cost of capital and ROR analysis that support the
19 just and reasonable rates for Spire Missouri's natural gas utility service. Second, Staff reviews
20 the current economic environment and capital market conditions. Third, Staff presents the

¹² Schedule SJW-d15, Won's Direct Testimony.

¹³ Ibid.

¹⁴ Schedule SJW-d6, Won's Direct Testimony.

¹⁵ Staff's Data Request No. 0212.1.

¹⁶ S&P Capital IQ Pro.

¹⁷ Schedule SJW-d16, Won's Direct Testimony.

1 corporate analysis of Spire Missouri and its parent company's business profile and credit
2 ratings. Fourth, Staff explains its cost of capital and ROR analysis using Spire Missouri's capital
3 structure. Fifth, Staff concludes with a presentation of Staff's recommended ROE, cost of debt,
4 and capital structure for calculating Spire Missouri's allowed ROR for ratemaking purpose.

5 **II. REGULATORY PRINCIPLES**

6 Q. Please describe the regulatory principles that guide the determination of a just
7 and reasonable ROR for a regulated utility.

8 A. The determination of a fair ROR is guided by principles of economic and
9 financial theory as well as by certain minimum Constitutional standards. Investor-owned
10 public utilities, such as Spire Missouri, are private property that the state may not
11 confiscate without appropriate compensation. The United States Supreme Court has described
12 the minimum characteristics of a Constitutionally-acceptable ROR in two frequently-cited
13 cases: *Bluefield Water Works & Improvement Co. v. Public Service Commission of West*
14 *Virginia*, and *Federal Power Commission v. Hope Natural gas Co.*¹⁸

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

- 17 1. A return consistent with returns on investments of comparable risk;
- 18 2. A return that allows the utility to attract capital on reasonable terms; and
- 19 3. A return sufficient to assure confidence in the utility's financial integrity.

¹⁸ *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); *Federal Power Commission v. Hope Electric Co.*, 320 U.S. 591, 64 S.Ct. 281, 88 L.Ed. 333 (1943).

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

5 Methodologies of financial analysis have advanced greatly since the *Bluefield* and *Hope*
6 decisions.¹⁹ Additionally, today's utilities compete for capital in a global market rather than a
7 local market. Nonetheless, the parameters defined in those cases are readily met using current
8 methods and theory. The principle of commensurate return is based on the concept of risk.
9 Financial theory holds that the return an investor may expect is reflective of the degree of risk
10 inherent in the investment; risk being a measure of the likelihood that an investment will not
11 perform as expected by that investor. Any line of business carries with it its own risks, and it
12 follows, therefore, that the return Spire Missouri's shareholders may expect is equal to that
13 required by shareholders of comparable-risk utility companies.

14 Q. How do you estimate a just and reasonable authorized ROE regarding
15 commensurate return and comparable-risk?

16 A. Staff employed a comparative COE analysis for authorized ROE estimation.
17 COE is a market-determined, minimum return investors are willing to accept for their
18 investment in a company compared to returns on other available investments. Using market
19 data, COE can be directly estimated. An authorized ROE, on the other hand, is a
20 Commission-determined return granted to monopoly industries, allowing them the
21 opportunity to earn just and reasonable compensation for their investments in the rate base.

¹⁹ Neither the Discounted Cash Flow ("DCF") nor the Capital Asset Pricing Model ("CAPM") methods were in use when those decisions were issued.

1 Stock market data cannot directly determine an authorized ROE. However, Staff can estimate
2 a just and reasonable authorized ROE anticipated by the financial market by using a previous
3 Commission-determined ROE and changes in estimated COEs over different periods of time,
4 that are measured for a comparable group of companies having similar risks.

5 Q. What are your conclusions regarding the regulatory principles that guide the
6 determination of a just and reasonable ROE in this proceeding?

7 A. Staff relied primarily on the analysis of a comparable group of companies to
8 estimate the COE for Spire Missouri, applying this comparable-company approach through the
9 use of both the DCF method and the CAPM analysis. Properly used and applied in appropriate
10 circumstances, both the DCF and the CAPM can provide accurate estimates of utilities' COE.
11 It is a well-accepted economic theory that a company that earns its cost of capital will be able
12 to attract capital and maintain its financial integrity. Therefore, Staff's recommendation of an
13 authorized ROE, based on a COE derived from the comparison of peer companies, is consistent
14 with the principles set forth in *Bluefield* and *Hope*.

15 **III. MARKET CONDITIONS**

16 Q. Why is consideration of economic and capital market conditions important for
17 ROE analysis?

18 A. Determining whether a cost of capital estimate is just and reasonable requires a
19 good understanding of current economic and capital market conditions, with the former having
20 a significant impact on the latter. In the comparative COE analysis, input values for
21 COE estimate models change from the former time-period to the latter time-period to reflect
22 the current economic and capital market conditions. With this in mind, Staff emphasizes that

1 an estimate of a utility's COE and authorized ROE recommendations should pass the "common
2 sense" test when considering the broader current economic and capital market conditions.

3 **1. Economic Conditions**

4 Q. Please summarize the current economic conditions regarding COE.

5 A. After recovering in 2021 from the COVID-19 pandemic recession, economic
6 activity edged down during the first and second quarters of 2022.²⁰ Recent indicators of
7 spending and production have softened although job gains have been robust in recent months
8 and the unemployment rate has remained low.²¹ The invasion of Ukraine by Russia is
9 creating upward pressure on inflation. COVID-19-related lockdowns in China are creating
10 supply chain disruptions.²² The impact of these issues for the U.S. economy are highly
11 uncertain.²³ On July 27, 2022, the Federal Open Market Committee ("FOMC") decided to raise
12 the target range for the federal funds rate to between 2.25% and 2.50%.²⁴ During the FOMC
13 meeting, the participants assessed appropriate monetary policy and determined the target level
14 for the federal funds rate. They concluded the appropriate range to be from 3.125% to 3.875%
15 and 2% to 3%, in 2022 and the longer run, respectively.²⁵ The Fed anticipates that ongoing
16 increases to the target range will be appropriate in the future.²⁶

²⁰ Bureau of Economic Analysis, Gross Domestic Product, Second Quarter 2022, Retrieved August 1, 2022, <https://www.bea.gov/news/2022/gross-domestic-product-second-quarter-2022-advance-estimate>.

²¹ Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published July 27, 2022 and retrieved August 1, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm>.

²² Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published June 16, 2022 and retrieved June 17, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220615a.htm>.

²³ Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published May 4, 2022 and retrieved May 6, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220504a.htm>.

²⁴ Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published July 27, 2022 and retrieved August 1, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm>.

²⁵ Federal Reserve Board and Federal Open Market Committee release economic projections from the June 14-15 FOMC meeting, <https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20220615.htm>.

²⁶ Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published July 27, 2022 and retrieved August 1, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm>.

1 The price investors are willing to pay for a share of stock includes the expectation of
2 high inflation and potential increases to the federal funds rate and has already been factored in
3 since the beginning of 2021.²⁷ This means that lower real returns from investments are already
4 reflected in the current financial market. Therefore, high inflation rates do not necessarily mean
5 a higher cost of capital than presently reflected.

6 Q. Please explain the current economic conditions using economic indicators.

7 A Since 2020, the economy has experienced enormous volatility. Real GDP fell
8 by 32.9% in the second quarter of 2020, after a 5% decline in the first quarter.²⁸ The third
9 and fourth quarters of 2020 saw real GDP increase by 33.4% and 4.3%, respectively.²⁹
10 Subsequently, the first, second, third, and fourth quarters of 2021 had corresponding real GDP
11 growth rates of 6.3%, 6.7%, 2.3%, and 6.9%. Real GDP decreased at an annual rate of 1.4%
12 and 0.9% in the first and second quarters of 2022, respectively.³⁰ The Congressional Budget
13 Office (“CBO”) projects a real GDP growth rate of 3.0% for 2023 and 1.8% for 2024.³¹ The
14 Fed projects a longer-run³² real GDP growth rate of 1.6% to 2.2%.³³ The U.S. Energy

²⁷ Forbes, Jonathan Ponciano, Here’s The Biggest Risk For The Stock Market This Year, According To Morgan Stanley Experts, Published January 4, 2021, retrieved November 22, 2021,

<https://www.forbes.com/sites/jonathanponciano/2021/01/04/biggest-risk-for-stock-market-this-year/?sh=31bfd21f80e>.

²⁸ Percentage change from the preceding quarter.

²⁹ Bureau of Economic Analysis, retrieved in November 19, 2021,

<https://www.bea.gov/news/2021/gross-domestic-product-first-quarter-2021-advance-estimate>.

³⁰ Bureau of Economic Analysis, Gross Domestic Product, Second Quarter 2022, Retrieved August 1, 2022,

<https://www.bea.gov/news/2022/gross-domestic-product-second-quarter-2022-advance-estimate>.

³¹ Congressional Budget Office, An Update to the Budget and Economic Outlook: 2022 to 2032,

<https://www.cbo.gov/system/files/2022-05/57950-Outlook.pdf>.

³² According to Fed, the longer-run projections are the rates of growth, inflation, unemployment, and federal funds rate to which a policymaker expects the economy to converge over time in the absence of further shocks and under appropriate monetary policy.

<https://fred.stlouisfed.org/series/FEDTARMDLR#:~:text=The%20longer-run%20projections%20are%20the%20rates%20of%20growth%2C,of%20further%20shocks%20and%20under%20appropriate%20monetary%20policy>.

³³ FOMC, Summary of Economic Projections, published March 16, 2022,

<https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20220316.pdf>.

1 Information Administration (“EIA”) projects a long-term real GDP growth rate of 2.2%.³⁴ The
2 CBO projected a long-term real potential GDP growth rate of 1.5%.³⁵ In July 2022, the
3 CBO projected a nominal GDP growth rate of 3.90%, up from the 3.80% it previously projected
4 in February 2021.³⁶

5 Regarding COVID-19, there has been an increased availability of vaccines, increased
6 vaccination rates, and the Fed had given assurances that indicators of economic activity and
7 employment have continued to strengthen.³⁷ During economic recovery, utilities tend to
8 underperform the broader market, which, consequently, pushes the COE for utilities higher.
9 Compounded by the current fears of continued rising inflation, the share prices of utility equities
10 are currently depressed and COEs are elevated. All else being equal, high inflation expectations
11 lead to higher interest rates. The Fed still expects the Personal Consumption Expenditures
12 (“PCE”)³⁸ inflation rate to slow down to 2.6% and 2.2% in 2023 and 2024, respectively, above
13 the Fed’s long-term target of 2.0%.³⁹

14 With COVID-19 causing widespread economic shutdown and pushing interest rates
15 higher, the Fed intervened in March 2020 to cut the federal discount rate to a range of 0% to
16 0.25%.⁴⁰ On July 27, 2022, to fight against the worst inflation in 40 years, the Fed increased

³⁴ Energy Information Administration, retrieved in April 23, 2022.

<https://www.eia.gov/outlooks/aeo/data/browser/#?id=18-AEO2022&sourcekey=0>.

³⁵ Congressional Budget Office, The 2022 Long-Term Budget Outlook, Figure 2-2, page 27,

<https://www.cbo.gov/system/files/2022-07/57971-LTBO.pdf>.

³⁶ Congressional Budget Office, The 2022 Long-Term Budget Outlook, Figure B-1, page 40,

<https://www.cbo.gov/system/files/2022-07/57971-LTBO.pdf>, and

Congressional Budget Office, An Update to the Budget and Economic Outlook: 2021 to 2031, page 12,

<https://www.cbo.gov/system/files?file=2021-02/56970-Outlook.pdf>.

³⁷ Federal Reserve, Press Release, March 16, 2022,

<https://www.federalreserve.gov/monetarypolicy/files/monetary20220316a1.pdf>.

³⁸ The difference between CPI and PCE is explained in the link:

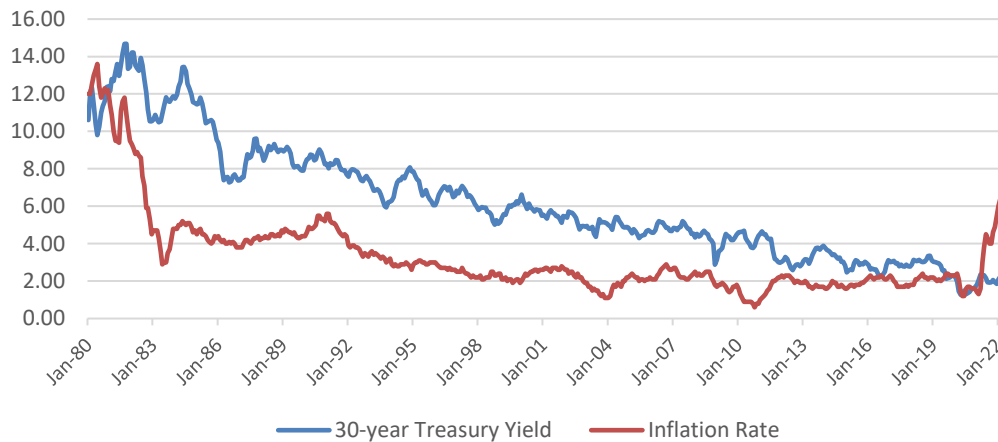
<https://www.stlouisfed.org/publications/regional-economist/july-2013/cpi-vs-pce-inflation--choosing-a-standard-measure>.

³⁹ Federal Reserve Board and Federal Open Market Committee release economic projections from the June 14-15 FOMC meeting, <https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20220615.htm>.

⁴⁰ Reuters, Federal Reserve statement - lowering federal funds rate to 0 to .25%, published March 15, 2021,

1 the target for the federal funds rate to a range of 2.25% to 2.50%, and anticipates that ongoing
2 increases in the target range will be appropriate.⁴¹ The Fed already started reducing the monthly
3 pace of its net asset purchases due to the progress of the economy.⁴²

4 **Figure 1. 30-year Treasury yield and Inflation Rate 1980-2022⁴³**



5
6 Figure 1 compares 30-year Treasury yields and the U.S. inflation rate from January 1980
7 through July 2022. The effects of COVID-19 and high inflation fears have increased market
8 risk and, consequently, pushed utilities' COEs higher. As the Fed signaled, it is expected that
9 interest rates will continue to rise because of the current high inflation rate.⁴⁴ The aggregate
10 effect of the Fed's actions was an incline in 30-year Treasury yields from 1.69% on December
11 3, 2021, to a high of 3.45% on June 14, 2022.⁴⁵ With interest rates expected to continue rising,

<https://www.reuters.com/article/us-health-coronavirus-central-banks-fed-idUSKBN2121A0>.

⁴¹ Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published July 27, 2022, and retrieved August 1, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm>.

⁴² Federal Reserve issues FOMC statement, published in December 15, 2021, retrieved on December 25, 2021, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20211215a.htm>.

⁴³ Won' Direct Workpaper.

⁴⁴ Federal Reserve issues Federal Open Market Committee (FOMC) Statement, published July 27, 2022, and retrieved August 1, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm>.

⁴⁵ Federal Reserve Economic Data, Market Yield on U.S. Treasury Securities at 30-Year Constant Maturity, <https://fred.stlouisfed.org/series/DGS30>.

1 it is reasonable to expect utilities' COEs to remain elevated in the near future. However, the
2 expectation that COEs remain elevated in the near future may not actually occur and is
3 dependent on other economic and financial conditions. As shown in Figure 1, there is no
4 perfectly positive correlation between inflation rates and 30-year Treasury yields. Furthermore,
5 the monthly average 30-year Treasury yields changed from a high of 3.25% in June 2022 to
6 3.10% in July 2022. Currently, the daily 30-year Treasury yields shows a decreasing trend since
7 June 15, 2022, and is 2.96% as of August 3, 2022.

8 The Fed has a dual mandate: maximum employment and stable prices.⁴⁶ In July 2022,
9 the unemployment rate (3.5%) reached the pre-pandemic level (3.5%) from February 2020.⁴⁷
10 In the FOMC meeting held on June 14-15, 2022, the Fed's growth forecast indicated policy
11 makers expected the U.S. economy to grow by 3.3% in 2022 and unemployment to rise to 3.8%
12 by year-end 2022.⁴⁸ Currently, the overall global and U.S. economic conditions indicate a
13 higher COE than the 2021 Spire Case because of expected rising interest rates in 2022.

14 2. Capital Market Conditions

15 Q. Why is consideration of capital market conditions important for COE analysis?

16 A. The capital market conditions are important to estimate COE because they have
17 a direct impact on input values of COE models. A utility company's cost of capital reflects its
18 mix of equity and debt financing and is affected by the equity and debt markets. For example,
19 equity market conditions have a direct impact on input values such as dividend yields in the

⁴⁶ Fed, What economic goals does the Federal Reserve seek to achieve through its monetary policy?
<https://www.federalreserve.gov/faqs/what-economic-goals-does-federal-reserve-seek-to-achieve-through-monetary-policy.htm>.

⁴⁷ Bureau of Labor Statistics, News Release July 2022, retrieved August 19, 2022,
<https://www.bls.gov/news.release/pdf/empsit.pdf>.

⁴⁸ Fed, Summary of Economic Projections, published June 16, 2022,
<https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20210616.pdf>.

1 DCF model, and debt market conditions directly impact the input values such as the risk-free
2 rate of 30-year Treasury bond yields in the CAPM method.

3 **2.1 Utility Equity Market**

4 Q. Please explain the current utility equity market conditions.

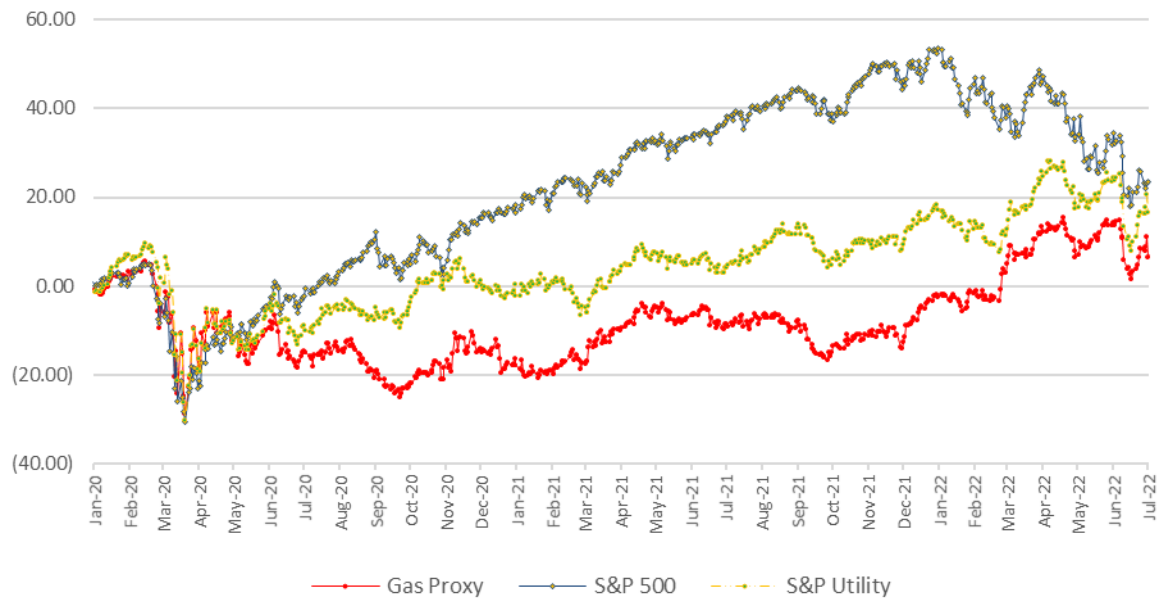
5 A. After the 2020 stock market crash caused by the COVID-19 pandemic, the
6 utilities sector underperformed the broader market. At the onset of the economic shutdown in
7 March 2020, the index-value of the S&P 500 and the Dow Jones Industrial Average fell
8 approximately 12.5% and 13.74%, respectively.⁴⁹ Figure 2 shows the volatility experienced by
9 the stock market since January 2020.

10 The total return of the S&P 500 Utilities decreased from the point of reference on the first
11 day of 2020 to an approximate loss of thirty percent (-30%) in March 2020, only to rebound to
12 a gain of approximately forty-six percent (46%) from the point of reference by January 2022.
13 Subsequently, the total return realized an approximate gain of twenty-five percent (25%) by
14 June 2022. A detailed analysis of the performance of the equity market since January 2020
15 reveals tremendous volatility. As shown in Figure 2, the S&P 500 had total returns of 53.56%
16 compared to only 17.13% for the S&P 500 Utilities sector on the first day of 2022 from the
17 point of reference on the first day of 2020. Staff's natural gas proxy group of companies also
18 under-performed, returning -2.42% in the same period. But, in the first half of 2022, S&P500,
19 S&P 500 Utilities and Staff's natural gas proxy group's total returns shows a convergence
20 trend and, as of June 30, 2022, are 21.97%, 17.61% and 8.25%, respectively.

⁴⁹ S&P Capital IQ Pro.

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Figure 2. Total Return 2020-2022



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The average of Staff’s natural gas utility proxy group’s stock price is currently higher than when Staff presented testimony for the 2021 Spire Case.⁵⁰ Higher stock prices, all else being equal, mean a lower COE. Staff also analyzed other variables that affect change in COE: dividend yields and expected growth rates. Lower dividend yields, all else being equal, mean a lower COE. Staff compared dividend yields from the measurement period (January, February, and March 2021) in the 2021 Spire Case to the dividend yields of the current measurement period (April, May, and June 2022). The average dividend yield of Staff’s natural gas utility proxy group was 3.61% during Q1 2021 compared to 3.05% in the current period of Q2 2022, a decrease of 56 basis points.⁵¹ Projected Earnings per share (“EPS”) growth rates for Staff’s proxy group increased from 6.86% to 7.86% during the period of Q1 2021 and Q2 2022,

⁵⁰ Wall Street Journal; Average Monthly Highest and Lowest.

⁵¹ The Value Line Investment Survey: Ratings & Reports.

1 respectively.⁵² Higher estimated growth rates, all else being equal, signal a higher required
2 return to investors. Therefore, the input variables of the DCF model show mixed signals in
3 terms of COE estimate changes.

4 Q. Please explain how current utility equity market conditions affect the DCF COE
5 estimation.

6 A. The combined effect of the utility sector's current incline in 2022, after its
7 unusual decline in 2020 and subsequent sluggish recovery, is that the utility sector has been
8 relatively undervalued since the COVID-19 recession. Average stock prices for Staff's proxy
9 group of companies is \$70.63 in Q2 2022 compared to \$57.47 in Q1 2021.⁵³ Inclining stock
10 prices, all else remaining the same, mean a decreasing COE.⁵⁴ The principal reason for
11 Staff's proxy group stock prices to incline is the relatively undervalued stock price of natural
12 gas utilities. For example, the Price-to-EPS ("P/E") ratio of Spire Inc. was 55.44x on
13 November 10, 2020, which dropped to 12.02x on December 1, 2021 and in June of 2022 was
14 approximately 18.5x. Higher stock prices with the same level of dividends result in lower
15 dividend yields. Lower dividend yields, all else being equal, mean lower COE. Consequently,
16 the current stock market climate justifies decreasing COE estimates compared to the 2021
17 Spire Case. The net effect of the changes in stock prices, dividend yields, and growth rates
18 indicates the DCF COE estimate decreased by approximately 40 basis points since Staff
19 conducted its analysis for the 2021 Spire Case.⁵⁵ However, only considering the equity market
20 and using only the DCF model is not sufficient to estimate a proper COE. To recommend a just

⁵² Schedule SJW-d11, Won' Direct Testimony.

⁵³ Schedule SJW-d12, Won' Direct Testimony.

⁵⁴ In the DCF COE model, inclining stock prices, all else being equal, leads to lower dividend yields. Dividend yields are a component of COE.

⁵⁵ Schedule SJW-d13, Won' Direct Testimony.

1 and reasonable authorized ROE for the purpose of ratemaking for Spire Missouri in this
2 proceeding under a rising interest rate environment, Staff also considered other factors like the
3 utility debt market and utilized a CAPM COE comparative analysis.

4 **2.2 Utility Debt Market**

5 Q. Please explain the current utility debt market conditions.

6 A. The utility debt market has not been stable in terms of bond yield changes.
7 Average public utility bond yields fell from 4.48% in January 2019, to 2.76% in August 2020.⁵⁶
8 This downward trend in public utility bond yields reversed after the Fed started its Treasury
9 bond-buying activity.⁵⁷ In July 2022 the Fed decided to raise the target range for the federal
10 funds rate to between 2.25% and 2.50%.⁵⁸ Compared to the yield in August 2020, public utility
11 bond yields rose by 215 basis points to 4.91% in June 2022.⁵⁹ The changes in public utility
12 bond yields mirrored the changes in the 30-Year Treasury bond yields. With a few exceptions,
13 30-Year Treasury bond yields have historically been positively correlated with public utility
14 bond yields.⁶⁰ The biggest factor currently driving interest rates is the fear of continued
15 higher inflation.

16 Q. Have the utility debt market conditions changed since the Commission last
17 ordered an authorized ROE in the 2021 Spire Case?

18 A. Yes. Since the Commission last ordered an authorized ROE of 9.37% in the
19 2021 Spire Case,⁶¹ the 30-Year Treasury bond yield increased 97 basis points from 2.07% in

⁵⁶ Schedule SJW-d4-1, Won' Direct Testimony.

⁵⁷ Brookings, The Hutchins Center Explains, <https://www.brookings.edu/series/the-hutchins-center-explains/>.

⁵⁸ Federal Reserve issues FOMC Statement issued July 27, 2022 and retrieved August 6, 2022, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm>.

⁵⁹ Schedule SJW-d4-1, Won' Direct Testimony.

⁶⁰ Schedule SJW-d4-3, Won' Direct Testimony.

⁶¹ On page 97, *Amended Report and Order* issued November 12, 2021, in Case No. GR-2021-0108.

1 Q1 2021 to 3.04% in Q2 2022.⁶² Average public utility bond yields increased 150 basis points
2 from 3.18% in Q1 2021 to 4.68% in Q2 2022.⁶³ The average A and Baa public utility
3 bond yields increased from 3.15% and 3.42% in Q1 2021 to 4.64% and 4.97% in Q2 2022,
4 respectively.⁶⁴

5 Q. Are the changed utility debt market conditions reflected in Staff's COE analysis
6 in this case?

7 A. Yes. Staff's comparative COE analysis covers the two periods of Q1 2021 and
8 Q2 2022. Q1 2021 is the measurement period used to derive the last ordered authorized ROE
9 from the Commission in Case No. GR-2021-0108 for Spire Missouri. For the current rate case,
10 Staff compared the average utility bond yields for the three-month period of January, February
11 and March 2021 to the three-month period of April, May, and June 2022. The three-month
12 average utility bond yield was 3.18% in the 2021 Spire Case compared to 4.68% in the current
13 rate case, an increase of 150 basis points.⁶⁵

14 Q. Is there a correlation between utility debt yields and stock prices?

15 A. Although utilities' COEs are not perfectly correlated to changes in utility debt
16 yields, it is widely recognized in the investment community that regulated utility stocks are a
17 close alternative to bond investments and, therefore, the two values are highly correlated over
18 time. In general, as interest rates increase, utility stock prices decrease, pushing COE up as
19 investors substitute stocks with bonds in search for higher yields.⁶⁶ However, as explained
20 above, natural gas utility stock prices have increased since the 2021 Spire Case.

⁶² Schedule SJW-d4-2, Won' Direct Testimony.

⁶³ Schedule SJW-d4-1, Won' Direct Testimony.

⁶⁴ Schedule SJW-d4-5, Won' Direct Testimony.

⁶⁵ Schedule SJW-d4-1, Won' Direct Testimony.

⁶⁶ Forbes Advisor, How To Invest When Interest Rates Are Low, Updated: Apr 15, 2022 and retrieved
May 7, 2022, <https://www.forbes.com/advisor/investing/low-interest->

1 Exchange Commission ("SEC") in November 2021 provides a good description of Spire
2 Missouri and Spire's current business operations and current organizational structure.

3 Spire Missouri operates as a public utility that engages in the purchase, retail
4 distribution and sale of natural gas, with its primary offices located in St. Louis, Missouri.
5 Spire Missouri operates as a major natural gas distribution utility system in Missouri that
6 serves approximately 1.2 million residential, commercial and industrial customers across
7 two regions, Spire Missouri East (serving St. Louis and eastern Missouri) and Spire
8 Missouri West (serving Kansas City and western Missouri). Spire Missouri also transports
9 gas through its distribution system for certain larger customers who buy their own gas on the
10 wholesale market. The earnings of Spire Missouri are primarily generated by the sale of heating
11 energy. Spire Missouri utilizes Midcontinent, Gulf Coast, Northeast, and Rocky Mountain gas
12 sources to provide a level of supply diversity that facilitates the optimization of pricing
13 differentials as well as protecting against the potential of regional supply disruptions.

14 Spire Missouri focuses its gas supply portfolio around various natural gas suppliers with
15 equity ownership or control of assets situated to complement its regionally diverse firm
16 transportation arrangements. The mains and service lines are located in municipal streets or
17 alleys, public streets or highways, or on lands of others for which Spire Missouri has obtained
18 the necessary legal rights to place and operate its facilities on such property. Spire Missouri
19 has an underground natural gas storage facility, various operating centers, and other
20 related properties. All of Spire Missouri's utility plant is subject to the liens of its mortgage.
21 Spire Missouri entered into firm agreements with suppliers, including both major producers
22 and marketers providing flexibility to meet the temperature-sensitive needs of its customers.
23 Spire Missouri is not publicly-traded and is totally owned by Spire.

1 Q. Please provide the corporate profile of Spire.

2 A. Spire is the holding company of Spire Missouri. Spire, together with its
3 subsidiaries, engages in the purchase, retail distribution, and sale of natural gas to residential,
4 commercial, industrial, and other end-users of natural gas in the United States. Spire operates
5 in two segments, Gas Utility and Gas Marketing. Spire's gas utility segment includes the
6 regulated operations of Spire Missouri, Spire Alabama Inc., Spire Gulf Inc. and Spire
7 Mississippi Inc. Spire's marketing segments includes Spire Marketing Inc. (Spire Marketing),
8 a wholly owned subsidiary providing natural gas marketing services.

9 In addition, Spire engages in the transportation of propane through its propane pipeline;
10 compression of natural gas; risk management; and other activities. Further, it provides physical
11 natural gas storage services. Other components of the company's consolidated business
12 information include the Spire STL Pipeline, Spire Storage West LLC (Spire Storage) and the
13 Spire's subsidiaries engaged in the operation of a propane pipeline, the compression of natural
14 gas, and risk management, among other activities.

15 Spire, formerly known as The Laclede Group, Inc. (founded in 1857), changed its name
16 to Spire Inc. in April 2016 and is based in St. Louis, Missouri. As of September 30, 2021,
17 Spire had 3,710 employees, including 2,489 for Spire Missouri.

18 Q. What are the credit ratings for Spire Missouri and Spire?

19 A. Spire Missouri and Spire each receive individual credit ratings as stand-alone
20 entities. Spire Missouri is currently rated by Moody's and Standard & Poor's ("S&P") and is
21 assigned corresponding ratings of 'A1' and 'A-'.⁶⁹ These ratings are higher than or equal to
22 natural gas utilities' average bond ratings A3 and A- characterized by Moody's and S&P,

⁶⁹ S&P Capital IQ Pro, retrieved June 24, 2022 (<https://www.capitaliq.spglobal.com>).

1 respectively.⁷⁰ The corporate credit ratings assigned to Spire by Moody's and S&P are
2 accordingly 'Baa2' and 'A-'.⁷¹

3 **V. CAPITAL STRUCTURE**

4 Q. What issues did Staff consider to determine its capital structure for Spire
5 Missouri?

6 A. Staff considered two major issues to determine its capital structure for
7 Spire Missouri. First, which capital structure should be used for the purpose of ratemaking in
8 this proceeding: the parent company Spire's consolidated capital structure or the operation
9 company Spire Missouri's standalone capital structure? Second, what amount of short-term
10 debt, if any, should be included in the ratemaking capital structure? For proper recommendation
11 on these issues, Staff reviewed the financial relationship between Spire and Spire Missouri and
12 how Spire Missouri's short-term debt was used. For regulatory consistency, Staff reviewed the
13 Commission's previous decisions on these issues in Spire Missouri rate cases.

14 Q. Please explain the Commission's past decisions regarding Spire Missouri's
15 capital structures used for the purpose of ratemaking.

16 A. In the Spire Missouri's general rate cases, Case Nos. GR-2017-0215,
17 GR-2017-0216 and GR-2021-0108, the Commission ordered that Spire Missouri's standalone
18 capital structure be used for the purpose of ratemaking. Regarding the issue of short-term debt
19 in its capital structure, the Commission's decision in the 2021 Spire Case was that the
20 average short-term debt in excess of short-term assets over the 13-month period, excluding both

⁷⁰ Ibid.

⁷¹ Ibid.

1 short-term assets and short-term debt related to Winter Storm Uri, should be included in
2 the rate making capital structure.⁷² This determination was based on the average amount
3 of short-term debt to finance long-term assets for a reasonable time period such as the most
4 recent 3 to 5 years.⁷³

5 Q. Have there been any significant changes in the relationship between Spire
6 and Spire Missouri that should alter the Commission's decision of using Spire Missouri's
7 standalone capital structure for the purpose of ratemaking?

8 A. No. There have not been any discernible changes to Spire Missouri's or
9 Spire's capital structure policies since the last rate cases that would cause Staff's
10 recommendation not to be consistent with the Commission's previous decisions. To determine
11 the financial independence of Spire Missouri to Spire, Staff reviewed the financial
12 relationship between the parent and the subsidiary such as Spire Missouri's source of capital
13 from Spire, the guarantee of Spire's financing using Spire Missouri's regulatory assets,
14 Spire's investments using double leverage, and Spire's non-utility operations. The capital
15 structure policies previously relied upon by the Commission in determining the appropriate
16 ratemaking capital structure for Spire Missouri still apply in the current case.

17 Q. Please explain the financial relationship between Spire and Spire Missouri
18 regarding capital structure for the purpose of ratemaking in this proceeding.

19 A. Spire Missouri operates as an independent entity, when considering Spire
20 Missouri's procurement of financing and the cost of that financing. Spire is not the primary
21 source of long-term financing for Spire Missouri and this appears to continue to be the case.⁷⁴

⁷² On page 96, Amended Report and Order issued November 12, 2021, in Case No. GR-2021-0108.

⁷³ On page 97, Amended Report and Order issued November 12, 2021, in Case No. GR-2021-0108.

⁷⁴ Staff's Data Request No. 0212.

1 Since January 2018, Spire Missouri has not received long-term financing from Spire or other
2 Spire subsidiaries.⁷⁵

3 Spire Missouri is an operating subsidiary of Spire and has separate credit ratings issued
4 by Moody's and S&P.⁷⁶ Spire Missouri's stand-alone capital structure supports its own credit
5 rating.⁷⁷ The debt is rated by credit rating agencies based on the stand-alone credit quality of
6 Spire Missouri.⁷⁸ Therefore, the cost of any debt that Spire Missouri has will be based on Spire
7 Missouri's creditworthiness. Actually, some rating agencies have rated Spire Missouri's credit
8 rating higher than Spire's. For example, the corporate credit ratings assigned by Moody's to
9 Spire Missouri is 'A1' while Spire is rated 'Baa2,' two notches lower.⁷⁹

10 Spire provides all equity and no debt financing to Spire Missouri.⁸⁰ Spire assets do not
11 secure Spire Missouri debt and Spire Missouri assets do not secure Spire debts.⁸¹ Spire
12 Missouri receives or provides short-term advances from or to Spire through its regulated
13 money-pool.⁸² The management members of Spire are included as part of the ultimate financial
14 decision makers for Spire Missouri.⁸³

15 Spire has not raised debt in order to contribute equity to Spire Missouri, and recent
16 contributions of equity to Spire Missouri by Spire were identical to simultaneous issuances of
17 equity by Spire in the public markets.⁸⁴ Therefore, Spire does not use double leverage for
18 investing in Spire Missouri.

⁷⁵ No.1, Staff's Data Request No. 0212.1.

⁷⁶ S&P Capital IQ Pro.

⁷⁷ No.4, Staff's Data Request No. 0212.1.

⁷⁸ Rating Direct, S&P Capital IQ.

⁷⁹ S&P Capital IQ Pro.

⁸⁰ No.2, Staff's Data Request No. 0212.1.

⁸¹ Page 88, 2021 10-K.

⁸² No.3, Staff's Data Request No. 0212.1.

⁸³ No.7, Staff's Data Request No. 0212.1.

⁸⁴ Staff's Data Request No. 0228.

1 In addition, Spire’s unregulated operations contribute around 5% of consolidated
2 earnings.⁸⁵ Hence, there are no significant concerns about the financial relationship between
3 Spire Missouri’s regulated utility service and Spire Inc.’s non-regulated business.

4 Q. What are the components of capital structure commonly considered for the
5 purpose of ratemaking in general rate proceedings?

6 A. In general, a ratemaking capital structure could be a mixture of debt and
7 equity including some or all of the following components: common stock, preferred stock,
8 long-term debt and short-term debt. For short-term debt, the portion of short-term debt that
9 supports long-term capital may be included in the capital structure. In other words, the amount
10 of short-term debt reasonably assumed necessary to support short-term assets and construction
11 work in progress (“CWIP”), may be a capital structure component.

12 Q. What was the Commission’s decision on short-term debt for the ratemaking
13 capital structure in Spire Missouri’s previous rate cases?

14 A. In Spire East and Spire West’s rate cases, Case Nos. GR-2017-0215 and
15 GR-2017-0216, the Commission determined that short-term debt should not be included in
16 Spire Missouri’s rate making capital structure because the average level of CWIP and other
17 short-term assets exceeded the amount of short term debt.⁸⁶ In Spire Missouri’s general rate
18 case, Case No. GR-2021-0108, the Commission determined that an appropriate amount of
19 short-term debt should be included in Spire Missouri’s ratemaking capital structure because
20 Spire Missouri was using some short-term debt to finance long-term assets.⁸⁷

⁸⁵ No.8, Staff’s Data Request No. 0212.1.

⁸⁶ On pages 44-45, *Amended Report and Order* issued March 17, 2018, in Case Nos. GR-2017-0215 and GR-2017-0216.

⁸⁷ On page 97, *Amended Report and Order* issued November 12, 2021, in Case No. GR-2021-0108.

1 Q. What is the average amount of Spire Missouri short-term debt used to finance
2 its long-term assets for a reasonable time period?

3 A. Ending June 2022, the 13-month average amount of Spire Missouri's short-term
4 debt and current assets are approximately \$231 million and \$196 million, respectively. The
5 average amount of Spire Missouri's short-term debt used to finance its long-term assets is
6 approximately \$35 million for the 13-month period ending June 30, 2022.⁸⁸ However, the most
7 recent trend (December 2021 through June 2022) is for Spire Missouri's short-term debt
8 balance to be less than the combined balance of short-term assets and CWIP. Staff witness
9 Kimberly K. Bolin presents an analysis comparing the amount of Spire Missouri's short-term
10 debt to its combined short-term assets and CWIP in her direct testimony and, based upon
11 that analysis, Staff recommends that no amount of short-term debt be included in Spire
12 Missouri's capital structure at this time. Staff will continue monitoring Spire Missouri's
13 short-term debt levels through the remainder of this proceeding and, if appropriate, will state
14 any change in position on this capital structure issue no later than Staff's true-up direct
15 testimony.

16 Q. Has Spire Missouri and Spire indicated to Staff that they would target specific
17 capital structures in the future for Spire Missouri and Spire?

18 A. Yes. Spire Missouri's response to Staff Data Request No. 0206 says Spire
19 Missouri targets a capital structure with an equity ratio of approximately 55%.⁸⁹ However,
20 Spire Inc. did not respond to Staff's request for its target structure.⁹⁰

⁸⁸ Schedule KKB-d2, Bolin Direct Testimony.

⁸⁹ Staff's Data Request No. 0012, GF-2022-0169.

⁹⁰ Staff's Data Request No. 0206.

1 Q. What is the actual capital structure of Spire Missouri and Spire?

2 A. The capital structure as of June 30, 2022 for Spire Missouri is approximately
3 51.87% common equity and 48.13% long-term debt.⁹¹ Table 1 below shows the average capital
4 structures of Spire and Spire Missouri for Q4 2021 through Q2 2022 subsequent to the 2021
5 Spire Case.⁹² As seen in Table 1, the average equity ratios for Q4 2021 through Q2 2022 were
6 approximately 51.08% and 42.43% for Spire Missouri and Spire Inc., respectively.⁹³

7 **Table 1. Comparison Average Capital Structure Q4 2021 – Q2 2022**

	<u>Spire Missouri</u>	<u>Spire Inc.</u>
Common Equity	51.08%	42.43%
Preferred Stock	0.00%	4.04%
Long-Term Debt	48.92%	53.53%
	100.00%	100.00%

8
9 Q. What is Staff's recommended capital structure for Spire Missouri in this
10 proceeding?

11 A. Considering the Commission's previous decisions and Spire Missouri's
12 financial relationship with Spire, Staff recommends the Commission to set Spire Missouri's
13 ROR based on Spire Missouri's standalone capital structure. The capital structure Staff
14 used for its analysis in this case is Spire Missouri's stand-alone capital structure composed of
15 51.87% common equity and 48.13% long-term debt, based on Spire Missouri's actual
16 capital structure as of June 30, 2022. Schedules SJW-5-1 and SJW-5-2 to this testimony,
17 and incorporated by reference herein, presents Spire Inc. and Spire Missouri's historical
18 capital structures and the associated capital ratios. Staff will keep monitoring Spire and

⁹¹ Schedule SJW-d6, Won' Direct Testimony.

⁹² *Amended Report and Order* issued November 12, 2021, in Case No. GR-2021-0108.

⁹³ Schedule SJW-d5-2, Won' Direct Testimony.

1 Spire Missouri's updated capital structures through the end of the true-up period, through
2 September 30, 2022, and will update its final recommendation to actual values at that time.

3 **VI. RATE OF RETURN**

4 Q. Please summarize the procedure that Staff used in its ROR analysis.

5 A. In order to arrive at Staff's recommended ROR, Staff employed the comparative
6 COE analysis. Staff specifically examined and evaluated: (1) the estimated COEs in the current
7 Spire Missouri rate case and the 2021 Spire Case; (2) the authorized ROE approved by the
8 Commission in the 2021 Spire Case; (3) the current embedded cost of debt; and (4) the allowed
9 ROR for the purpose of rate making in this proceeding. For this procedure, Staff started with
10 the selection of a natural gas proxy group.

11 **1. Proxy Group**

12 Q. How did you select the natural gas proxy group for the comparative COE
13 analysis?

14 A. Staff used a proxy group consisting of U.S. utilities that Value Line classifies as
15 Gas Utilities. Staff screened seven companies by ensuring that companies:⁹⁴

- 16 • are publicly traded;
- 17 • have more than five years of financial data available;
- 18 • have investment grade credit ratings from major U.S. credit rating agencies;
- 19 • have long-term growth coverage from at least two analysts;
- 20 • have no pending mergers or acquisitions;
- 21 • have not reduced dividends since 2015;
- 22 • have at least 65% of income from regulated operations; and

⁹⁴ Schedule SJW-9, Won's Direct Testimony.

- have at least 65% of assets in gas distribution operations.

Q. What is Staff’s natural gas proxy group for the comparative COE analysis?

A. The seven (7) natural gas utilities that met these criteria are in Table 2 below:

Table 2. Natural Gas Utility Proxy Group

Gas Utility Companies	Ticker
Atmos Energy Corporation	ATO
New Jersey Resources Corporation	NJR
Northwest Natural Holding Company	NWN
ONE Gas, Inc.	OGS
South Jersey Industries, Inc.	SJI
Southwest Gas Holdings, Inc.	SWX
Spire Inc.	SR

2. Cost of Common Equity

Q. Please explain how Staff conducted its comparative COE analysis.

A. Staff conducted its COE analysis for Spire Missouri by comparing the change in the COE analysis between the first quarter of 2021 (the reference time period of the 2021 Spire Case) and the second quarter of 2022 using the same proxy group of natural gas utility companies as shown in Table 2. The analysis Staff used to determine Spire Missouri’s COE consisted of Staff’s DCF COE analysis and CAPM COE analysis. These two analyses are widely accepted in the financial industry as a means to determine a fair and reasonable rate of return for regulated utility companies.⁹⁵

Staff determined that the COE comparative analysis using DCF and CAPM models is the most proper analysis to use in this case to recommend an ROE to the Commission for Spire Missouri. Staff estimated the COE for each time period using its DCF and CAPM analysis.

⁹⁵ *Ass’n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.*, Opinion No. 569, 169 FERC ¶ 61,129 (2019).

1 Staff also used the result of a bond yield plus risk premium method as a check of reasonableness
2 of its DCF and CAPM COE estimates. Staff then compared the result of its current DCF and
3 CAPM COE estimates to the 2021 Spire Case DCF and CAPM COE estimates. Comparing
4 these DCF and CAPM COE estimates allowed Staff to determine the approximate amount of
5 change in COE between Q1 2021 and Q2 2022 and then recommend a current range of
6 authorized ROE.

7 Q. Please explain the DCF model used for Staff's COE comparative analysis.

8 A. The DCF model used for Staff's COE comparative analysis is a widely used
9 model by investors to evaluate stable-growth investment opportunities, such as regulated utility
10 companies. The premise of the DCF model is that an investment in common stock is worth the
11 present value of the infinite stream of dividends discounted at a market rate commensurate with
12 the investment's risk. Using the following formula of the DCF model, investors determine a
13 common stock price:

14
$$P = D / (k - g),$$

15 where P is the common stock price,
16 D is the current dividend,
17 k is investors' required return from the stock, and
18 g is the expected growth rate in dividends.

19 Staff uses an adjusted dividend yield $(1 + .5g)D$ to account for the fact that the
20 dividends are paid on a quarterly basis.⁹⁶ For the growth rate, Staff used the average of

⁹⁶ *Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.*, Opinion No. 569, 169 FERC ¶ 61,129 (2019).

1 analysts' projected earnings per share ("EPS"), dividends per share ("DPS"), and book value
2 per share ("BVPS") and the projected nominal GDP growth rate.⁹⁷

3 It is important that the growth rate used in Staff's constant-growth DCF model
4 reflect the long-term investment horizon assumption implied in the constant-growth
5 DCF model. The Federal Energy Regulatory Commission ("FERC") also agreed as much
6 when it ruled, in Opinion 569, that the exclusive use of analysts' short-term growth rates in the
7 constant-growth DCF was inappropriate.⁹⁸ The formulation of the COE using the
8 constant-growth DCF formula is:

$$k = (1 + .5g)D / P + g.$$

9
10 Q. What is the result of the comparative COE analysis using the DCF model?

11 A. For the current rate case, the average DCF COE estimates of Staff's proxy group
12 is 9.00%.⁹⁹ Staff then recalculated COE using the DCF model for the 2021 Spire Case, using
13 the same proxy group of natural gas utility companies in Table 2. The 2021 recalculation
14 resulted in an average DCF COE estimate of Staff's proxy group of 9.38%.¹⁰⁰ Based on a
15 comparative DCF analysis, the COE estimate has decreased by approximately 38 basis points
16 from the last 2021 Spire Case.

17 Q. Please explain the CAPM used for Staff's COE comparative analysis.

18 A. The CAPM is built on the premise that the variance in returns over time is the
19 appropriate measure of risk, but only the non-diversifiable variance (systematic risk) is
20 rewarded. Systematic risks, also called market risks, are unanticipated events that affect almost

⁹⁷ *Entergy Arkansas, Inc.*, Opinion No. 575, 175 FERC ¶ 61,136 (2021).

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

⁹⁹ Schedule SJW-d13, Won's Direct Testimony.

¹⁰⁰ Schedule SJW-d13, Won's Direct Testimony,

1 all assets to some degree because the effects are economy wide. Systematic risk in an asset,
2 relative to the average, is measured by the beta of that asset.¹⁰¹ Unsystematic risks, also called
3 asset-specific risks, are unanticipated events that affect single assets or small groups of assets.
4 Because unsystematic risks can be freely eliminated by diversification, the appropriate reward
5 for bearing risk depends on the level of systematic risk.

6 The CAPM shows that the expected return for a particular asset depends on the pure
7 time value of money (measured by the risk free rate), the amount of the reward for bearing
8 systematic risk (measured by the market risk premium (“MRP”)), and the amount of systematic
9 risk incurred by the asset (measured by beta). Specifically, the CAPM methodology estimates
10 the cost of equity by taking the risk-free rate and adding the MRP multiplied by beta.¹⁰²
11 The MRP is calculated by subtracting the risk-free rate from the expected market return.
12 The general form of the CAPM is as follows:

$$k = R_f + \beta(R_m - R_f)$$

13
14 where, k is the expected return on equity for a security,
15 R_f is the risk-free rate,
16 R_m is the expected market return,
17 β is beta, and
18 $R_m - R_f$ is the MRP.

19 For the risk-free rate, Staff used the average yield on 30-year U.S. Treasury bonds for
20 the second quarter of 2022, which was 3.04%. For Staff’s CAPM analysis, it relied on
21 betas provided by Value Line.¹⁰³ For the MRP estimate, Staff relied on four sets of data.

¹⁰¹ Beta is a measure of the volatility—or systematic risk—of a security or portfolio compared to the market as a whole. (Investopedia, retrieved November 5, 2020).

¹⁰² Roger A. Morin, New Regulatory Finance (Public Utilities Reports, Inc. 2006).

¹⁰³ Value Line, <https://valueline.com/?msclkid=4ed36370d16911eca58154b129389016>.

1 The first data set is the long-term geometric mean of historical return differences between large
2 company stocks and long-term government bonds from 1926-2021, resulting in an MRP
3 estimate of 4.61%.¹⁰⁴ The second data set is the long-term arithmetic mean of historical return
4 differences between large company stocks and long-term government bonds from 1926-2021,
5 resulting in an MRP estimate of 6.03%.¹⁰⁵ The third data set is the long-term geometric mean
6 of historical return differences between S&P 500 and long-term government bonds from
7 1928-2021, resulting in an MRP estimate of 5.13%.¹⁰⁶ The fourth data set is the long-term
8 arithmetic mean of historical return differences between S&P 500 and long-term government
9 bonds from 1928-2021, resulting in an MRP estimate of 6.71%.¹⁰⁷

10 Q. What is the result of the comparative COE analysis using the CAPM method?

11 A. For the current rate case, the average CAPM COE estimates of Staff's proxy
12 group is 7.51%.¹⁰⁸ Staff then recalculated COE using the CAPM method for the 2021 Spire
13 Case, using the same proxy group of natural gas utility companies in Table 2. The 2021
14 recalculation resulted in an average CAPM COE estimate of Staff's proxy group of 6.71%.¹⁰⁹
15 Based on a comparative CAPM analysis, the COE estimate has increased by approximately
16 80 basis points from the last 2021 Spire Case.

17 3. Test of Reasonableness

18 Q. Did Staff test the reasonableness of its COE estimates using any other methods?

¹⁰⁴ Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.

¹⁰⁵ Ibid.

¹⁰⁶ Risk Premium, Damodaran Online, Stern School of Business, NYU.

¹⁰⁷ Ibid.

¹⁰⁸ Schedule SJW-d14, Won's Direct Testimony.

¹⁰⁹ Ibid.

1 A. Yes. Staff used the bond yield-plus risk premium method to test the
2 reasonableness of its COE estimates. The bond yield-plus risk premium method, called the
3 “rule of thumb” test of reasonableness in the CFA study guide, estimates the COE by
4 simply adding an equity risk premium to the yield-to-maturity (“YTM”) of the subject
5 company’s long-term debt.¹¹⁰ Based on general U.S. capital-market experience and regulated
6 utilities, the equity risk premium is approximately in the range of 3% to 5%.¹¹¹ For the
7 second quarter of 2022, “A” rated and “Baa” rated long-term utility bonds had average yields
8 of 4.54% and 4.84%, respectively.¹¹² Adding the 3% to 5% risk premium, the “rule of thumb”
9 indicates a cost of common equity between 7.54% and 9.84%. The bond yield-plus risk
10 premium COE estimate’s range of 7.54% to 9.84% supports the reasonableness of Staff’s COE
11 estimate of 8.25% using DCF and CAPM methods.¹¹³

12 **4. Return on Equity**

13 Q. Please explain the methodology used by Staff to determine its recommended
14 authorized ROE in this proceeding.

15 A. In the 2021 Spire Case, the Commission authorized an ROE of 9.37%.¹¹⁴ Based
16 on the recalculated result of Staff’s COE analysis for the 2021 Spire Case, the COE was 8.04%.
17 With the same proxy group, Staff’s COE analysis in the current Spire Missouri rate case
18 results in a COE of 8.25%.¹¹⁵ The difference between the two COEs is an increase of
19 approximately 21 basis points since the 2021 Spire Case. If there is no significant change in

¹¹⁰ Stowe, J. D., Robinson, T. R., Pinto, J. E., & McLeavey, D. W. (2002) Analysis of Equity Investment: Valuation. Association for Investment Management and Research.

¹¹¹ Roger A. Morin, New Regulatory Finance (Public Utilities Reports, Inc. 2006).

¹¹² Mergent Bond Record.

¹¹³ Schedule SJW-d15, Won’s Direct Testimony.

¹¹⁴ On page 38, *Amended Report and Order* issued July 23, 2020, in Case No. ER-2019-0374.

¹¹⁵ Schedule SJW-d15, Won’s Direct Testimony.

1 the Commission’s perspective on the relationship between the COE estimate and the authorized
2 ROE, it is reasonable to conclude that the current ROE should be approximately 21 basis points
3 higher than the authorized ROE of 9.37% in the 2021 Spire Case.

4 To recommend a just and reasonable ROE, Staff considered Spire Missouri’s unique
5 risk profiles and the current financial and economic market conditions. The current U.S.
6 inflation rate is at its highest level in 40 years.¹¹⁶ The Fed previously forecasted that the
7 higher inflation rate reflected “transitory” factors but not anymore.¹¹⁷ To combat inflation, the
8 Fed started to increase interest rates as Fed Chair Powell announced interest rate increases
9 in 2022.¹¹⁸ Considering all of the above information that Staff has reviewed, Staff recommends
10 the Commission authorize an ROE of 9.58% for Spire Missouri in this proceeding.

11 Q. Do you have any supporting evidence that the Commission can consider to
12 determine the reasonableness of Staff’s ROE recommendation?

13 A. Yes. Staff recognizes that the Commission may be interested in recent
14 authorized ROEs for other natural gas utility companies in the U.S. as a test of reasonableness
15 of Staff’s recommendation of authorized ROE. Table 3 presents information compiled
16 and published by the Regulatory Research Associates (“RRA”) which details the average
17 fully litigated and settled authorized ROE’s from Commissions around the U.S. in the years
18 2010 - 2022 along with the number of cases considered:¹¹⁹

¹¹⁶ Yahoo!Finance, Inflation surges 9.1% in June, most since November 1981, published July 13, 2022,
<https://finance.yahoo.com/news/june-cpi-preview-inflation-likely-surged-to-new-40-year-high-last-month-215233961.html>.

¹¹⁷ Federal Reserve, Press Release, March 16, 2022,
<https://www.federalreserve.gov/monetarypolicy/files/monetary20220316a1.pdf>.

¹¹⁸ Transcript of Chair Powell’s Press Conference, December 15, 2021.

¹¹⁹ S&P Capital IQ Pro: Regulatory Research Association, retrieved May 11, 2022.

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Table 3: Authorized ROE’s from Commissions in the U.S. (2010-2022)

Year	<u>Fully Litigated</u>		<u>Natural gas Utility Settled</u>		<u>Natural Gas Total</u>	
	ROE (%)	Case (No.)	ROE (%)	Case (No.)	ROE (%)	Case (No.)
2010	10.35	27	10.39	34	10.37	61
2011	10.39	26	10.12	16	10.29	42
2012	10.28	29	10.06	29	10.17	58
2013	9.85	17	10.12	32	10.03	49
2014	10.05	21	9.73	17	9.91	38
2015	9.66	16	10.04	15	9.84	31
2016	9.74	25	9.80	17	9.77	42
2017	9.73	24	9.75	29	9.74	53
2018	9.63	22	9.57	26	9.60	48
2019	9.58	27	9.76	20	9.66	47
2020	9.43	32	9.46	23	9.44	55
2021	9.28	27	9.57	25	9.42	52
2022	9.36	8	9.34	4	9.35	12

In 2022 to date, the average authorized ROE of natural gas utilities for fully litigated and settled cases is 9.36% and 9.34%, respectively, for an overall average of 9.35%. Considering the current trend of inclined interest rates, Staff’s recommended authorized ROE of 9.58% is generally consistent with ROEs recently authorized for other utilities around the country. It is Staff’s position that in order for Spire Missouri to be competitive on the capital market; they need to have the opportunity to earn an ROE that is reasonably consistent with ROEs awarded to other utilities around the country.

5. Embedded Costs of Debt

Q. What embedded cost of debt should the Commission authorize for Spire Missouri in this proceeding?

1 A. The embedded cost of debt the Commission should authorize for Spire Missouri
2 in this proceeding is Spire Missouri's embedded cost of debt, as of June 30, 2022, of 4.005%.¹²⁰
3 Staff will update its embedded cost of debt throughout this proceeding through the true-up
4 period, as actual information becomes available.

5 **VII. CONCLUSION**

6 Q. What is the conclusion of your direct testimony?

7 A. Considering the current financial and economic markets, particularly including
8 the surge in the inflation rate and interest rates, and Spire Missouri's risk profile, Staff's
9 comparative COE analysis supports a just and reasonable ROE of 9.58%, the mid-point in a
10 range of 9.33% to 9.83% for Spire Missouri. Because of the rapidly changing economic
11 outlook, Staff will update its ROE if there are significant changes in the economic outlook that
12 necessitate an update.

13 Staff's recommended ROE of 9.58% for Spire Missouri and embedded cost of debt of
14 4.005% applied to a capital structure of 48.13% long-term debt and 51.87% common
15 equity, results in an allowed ROR of 6.90%.¹²¹ Staff will continue to monitor Spire and
16 Spire Missouri's capital structure and cost of debt through the true-up period and will make its
17 final recommendation at that time.

18 Q. Does this conclude your direct testimony?

19 A. Yes, it does.

¹²⁰ Staff's Data Request No. 0204.

¹²¹ Schedule SJW-d16, Won's Direct Testimony.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Spire Missouri, Inc. d/b/a)
Spire's Request for Authority to Implement)
a General Rate Increase for Natural Gas)
Service Provided in the Company's)
Missouri Service Areas)

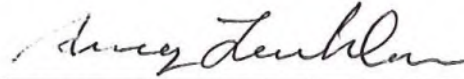
Case No. GR-2022-0179

AFFIDAVIT OF SEOUNG JOUN WON, PhD

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW SEOUNG JOUN WON, PhD and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Direct Testimony of Seoung Joun Won, PhD*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.



SEOUNG JOUN WON, PhD

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 26th day of August 2022.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
Commission Expires: April 04, 2025
Commission Number: 12412070



Notary Public

Credentials and Background of

Seoung Joun Won, PhD

I am currently employed as a Regulatory Compliance Manager in the Financial Analysis Department of the Financial and Business Analysis Division of the Missouri Public Service Commission. I have been employed at the Missouri Public Service Commission since May 2010.

I received my Bachelor of Arts, Master of Arts, and Doctor of Philosophy in Mathematics from Yonsei University and my Bachelor of Business Administration in Financial Accounting from Seoul Digital University in Seoul, South Korea, and earned my Doctor of Philosophy in Economics from the University of Missouri - Columbia. Also, I passed several certificate examinations for Finance Specialist in South Korea such as Accounting Management, Financial Risk Manager, Enterprise Resource Planning Accounting Consultant, Derivatives Investment Advisor, Securities Investment Advisor, and Financial Planner.

Prior to joining the Commission, I taught both undergraduate and graduate level mathematics at the Korean Air Force Academy and Yonsei University for 13 years. I served as the director of the Education and Technology Research Center in NeoEdu for 5 years. Before starting my current position at the Missouri Public Service Commission, I had served as a regulatory economist in Tariff/Rate Design Department.

My current duties at the Commission include financial analysis of rate of return and cost of equity, valuation analysis on merger and acquisition, due diligence review and supporting economic and statistical analysis.

List of Previous Testimony Filed

Seoung Joun Won, PhD

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
ER-2022-0130	Evergy Missouri West, Inc.	Rate of Return, Capital Structure
ER-2022-0129	Evergy Missouri Metro	Rate of Return, Capital Structure
GR-2021-0320	Empire District Gas Company	Rate of Return, Capital Structure
GF-2022- 0169	Spire Missouri, Inc.	Financing Authority
EF-2022-0164	Union Electric Co., d/b/a Ameren Missouri	Financing Authority
WF-2022-0161	Missouri-American Water Company	Financing Authority
EF-2022- 0103	Evergy Missouri West, Inc.	Financing Authority
WF-2021-0427	Raytown Water Company	Financing Authority
ER-2021-0312	Empire District Electric Company	Rate of Return, Capital Structure
WF-2022-0066	Missouri American Water Company	Financing Authority
GR-2021-0241	Union Electric Co., d/b/a Ameren Missouri	Rate of Return, Capital Structure
WF-2021-0131	Raytown Water Company	Financing Authority
GR-2021-0108	Spire Missouri, Inc.	Rate of Return, Capital Structure
EA-2021-0087	Ameren Transmission Company of Illinois	Financial Feasibility
EA-2020-0371	Union Electric Co., d/b/a Ameren Missouri	Financial Feasibility
SR-2020-0345	Missouri American Water Company	Rate of Return, Capital Structure

cont'd List of Previous Testimony Filed

Seoung Joun Won, PhD

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
WR-2020-0344	Missouri American Water Company	Rate of Return, Capital Structure
EF-2020-0301	Evergy Missouri Metro	Financing Authority
WR-2020-0264	Raytown Water Company	Rate of Return, Capital Structure
WR-2020-0053	Confluence Rivers Utility Operating Company, Inc.	Rate of Return, Capital Structure
HM-2020-0039	Veolia Energy Kansas City, Inc. AIP Project Franklin Bidco	Merger and Acquisition
EO-2019-0133	KCP&L Greater Missouri Operations Company, Evergy Metro	Business Process Efficiency
EO-2019-0132	Kansas City Power & Light Company, Evergy Metro	Business Process Efficiency
GO-2019-0059	Spire West, Spire Missouri, Inc.	Weather Variables
GO-2019-0058	Spire East., Spire Missouri, Inc.	Weather Variables
ER-2018-0146	KCP&L Greater Missouri Operations Co.	Weather & Normalization, Net System Input
ER-2018-0145	Kansas City Power & Light Co.	Weather & Normalization, Net System Input
GR-2018-0013	Liberty Utilities (Midstates Natural Gas) Corp.	Weather Variables
GR-2017-0216	Missouri Gas Energy (Laclede), Spire Missouri, Inc.	Weather Variables
GR-2017-0215	Laclede Gas Co., Spire Missouri, Inc.	Weather Variables
ER-2016-0285	Kansas City Power & Light Co.	Weather & Normalization, Net System Input
ER-2016-0179	Union Electric Co., d/b/a Ameren Missouri	Weather & Normalization, Net System Input
ER-2016-0156	KCP&L Greater Missouri Operations Co.	Weather & Normalization, Net System Input

cont'd List of Previous Testimony Filed

Seoung Joun Won, PhD

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
ER-2016-0023	Empire District Electric Company	Weather & Normalization, Net System Input
ER-2014-0370	Kansas City Power & Light Co	Weather & Normalization, Net System Input
ER-2014-0351	Empire District Electric Company	Weather & Normalization, Net System Input
ER-2014-0258	Union Electric Co., d/b/a Ameren Missouri	Weather & Normalization, Net System Input
EC-2014-0223	Noranda Aluminum, Inc., et al, Complaint v. Union Electric Co., d/b/a Ameren Missouri	Weather Variables
GR-2014-0152	Liberty Utilities (Midstates Natural Gas) Corp.	Weather Variables
GR-2014-0086	Summit Natural Gas of Missouri, Inc.	Weather Variables
HR-2014-0066	Veolia Energy Kansas City, Inc.	Weather Variables, Revenue
GR-2013-0171	Laclede Gas Co.	Weather Variables
ER-2012-0345	Empire District Electric Company	Weather Variables, Revenue
ER-2012-0175	KCP&L Greater Missouri Operations Co.	Weather Variables
ER-2012-0174	Kansas City Power & Light Co.	Weather Variables
ER-2012-0166	Union Electric Co., d/b/a Ameren Missouri	Weather Variables, Revenue
HR-2011-0241	Veolia Energy Kansas City, Inc.	Weather Variables
ER-2011-0028	Union Electric Co., d/b/a Ameren Missouri	Weather Variables, Revenue
ER-2011-0004	Empire District Electric Company	Weather Variables, Revenue
GR-2010-0363	Union Electric Co., d/b/a Ameren Missouri	Weather Variables

cont'd List of Previous Testimony Filed

Seoung Joun Won, PhD

<u>Case Number</u>	<u>Company</u>	<u>Issue</u>
ER-2010-0356	KCP&L Greater Missouri Operations Co.	Weather Variables
ER-2010-0355	Kansas City Power & Light Co.	Weather Variables, Revenue

Work Related Publication

Won, Seoung Joun, X. Henry Wang, and Henry E. Warren. "Climate normals and weather normalization for utility regulation." *Energy Economics* (2016).

DIRECT TESTIMONY

FOR

SPIRE MISSOURI

CASE NO. GR-2022-0179

APPENDIX 2

SCHEDULES

BY

Seoung Joun Won, PhD

Financial Analysis

MISSOURI PUBLIC SERVICE COMMISSION

August 31, 2022

Spire Missouri
Case No. GR-2022-0179

List of Schedules

Schedule	Description of Schedule
1	List of Schedules
2-1	Federal Reserve Discount Rates and Federal Reserve Funds Rates Changes
2-2	Graph of Federal Reserve Discount Rates and Federal Funds Rates Changes
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3-2	Graph of Rate of Inflation
4-1	Average Yields on Moody's Public Utility Bonds
4-2	Average Yields on Thirty-Year U.S. Treasury Bonds
4-3	Graph of Average Yields on Mergent's Public Utility Bonds and Thirty-Year U.S. Treasury Bonds
4-4	Graph of Monthly Spreads Between Yields on Moody's Public Utility Bonds and 30-Year U.S. Treasury Bonds
4-5	Graph of Average Yields on A and BBB+ Utility Bonds
5-1	Historical Consolidated Capital Structures (Dollar)
5-2	Historical Consolidated Capital Structures (Percentage)
6	Capital Structure
7	Rate Making Cost of Long-Term Debt
8	Rate Making Cost of Preferred Stock
9	Criteria for Selecting Comparable Utility Companies
10	Comparable Utility Companies
11	Historical and Projected Growth Rates
12	Average High / Low Stock Price
13	DCF Model Analysis of COE Estimates
14	CAPM Analysis of COE Estimates
15	Return on Equity
16	Rate of Return
17	Authorized Return on Equity

Spire Missouri
Case No. GR-2022-0179

Federal Reserve Discount Rate and Federal Reserve Funds Rate

Federal Reserve			Reserve			Federal Reserve		
Date	Discount Rate	Funds Rate	Date	Discount Rate	Funds Rate	Date	Discount Rate	Funds Rate
1-Jan	5.52	5.50	6-Jan	5.50	4.50	11-Jan	0.75	0.13
1-Feb	5.00	5.50	6-Feb	5.50	4.50	11-Feb	0.75	0.13
1-Mar	4.81	5.00	6-Mar	5.75	4.75	11-Mar	0.75	0.13
1-Apr	4.28	4.50	6-Apr	5.75	4.75	11-Apr	0.75	0.13
1-May	3.73	4.00	6-May	6.00	5.00	11-May	0.75	0.13
1-Jun	3.47	3.75	6-Jun	6.25	5.25	11-Jun	0.75	0.13
1-Jul	3.25	3.75	6-Jul	6.25	5.25	11-Jul	0.75	0.13
1-Aug	3.16	3.50	6-Aug	6.25	5.25	11-Aug	0.75	0.13
1-Sep	2.77	3.00	6-Sep	6.25	5.25	11-Sep	0.75	0.13
1-Oct	2.02	2.50	6-Oct	6.25	5.25	11-Oct	0.75	0.13
1-Nov	1.58	2.00	6-Nov	6.25	5.25	11-Nov	0.75	0.13
1-Dec	1.33	1.75	6-Dec	6.25	5.25	11-Dec	0.75	0.13
2-Jan	1.25	1.75	7-Jan	6.25	5.25	12-Jan	0.75	0.13
2-Feb	1.25	1.75	7-Feb	6.25	5.25	12-Feb	0.75	0.13
2-Mar	1.25	1.75	7-Mar	6.25	5.25	12-Mar	0.75	0.13
2-Apr	1.25	1.75	7-Apr	6.25	5.25	12-Apr	0.75	0.13
2-May	1.25	1.75	7-May	6.25	5.25	12-May	0.75	0.13
2-Jun	1.25	1.75	7-Jun	6.25	5.25	12-Jun	0.75	0.13
2-Jul	1.25	1.75	7-Jul	6.25	5.25	12-Jul	0.75	0.13
2-Aug	1.25	1.75	7-Aug	5.75	5.25	12-Aug	0.75	0.13
2-Sep	1.25	1.75	7-Sep	5.25	4.75	12-Sep	0.75	0.13
2-Oct	1.25	1.75	7-Oct	5.00	4.75	12-Oct	0.75	0.13
2-Nov	0.83	1.25	7-Nov	5.00	4.50	12-Nov	0.75	0.13
2-Dec	0.75	1.25	7-Dec	4.75	4.25	12-Dec	0.75	0.13
3-Jan	2.25	1.25	8-Jan	3.50	3.50	13-Jan	0.75	0.13
3-Feb	2.25	1.25	8-Feb	3.50	3.00	13-Feb	0.75	0.13
3-Mar	2.25	1.25	8-Mar	2.50	2.25	13-Mar	0.75	0.13
3-Apr	2.25	1.25	8-Apr	2.25	2.25	13-Apr	0.75	0.13
3-May	2.25	1.25	8-May	2.25	2.00	13-May	0.75	0.13
3-Jun	2.00	1.25	8-Jun	2.25	2.00	13-Jun	0.75	0.13
3-Jul	2.00	1.00	8-Jul	2.25	2.00	13-Jul	0.75	0.13
3-Aug	2.00	1.00	8-Aug	2.25	2.00	13-Aug	0.75	0.13
3-Sep	2.00	1.00	8-Sep	2.25	2.00	13-Sep	0.75	0.13
3-Oct	2.00	1.00	8-Oct	1.25	1.25	13-Oct	0.75	0.13
3-Nov	2.00	1.00	8-Nov	1.25	1.25	13-Nov	0.75	0.13
3-Dec	2.00	1.00	8-Dec	0.50	0.13	13-Dec	0.75	0.13
4-Jan	2.00	1.00	9-Jan	0.50	0.13	14-Jan	0.75	0.13
4-Feb	2.00	1.00	9-Feb	0.50	0.13	14-Feb	0.75	0.13
4-Mar	2.00	1.00	9-Mar	0.50	0.13	14-Mar	0.75	0.13
4-Apr	2.00	1.00	9-Apr	0.50	0.13	14-Apr	0.75	0.13
4-May	2.00	1.00	9-May	0.50	0.13	14-May	0.75	0.13
4-Jun	2.25	1.00	9-Jun	0.50	0.13	14-Jun	0.75	0.13
4-Jul	2.25	1.25	9-Jul	0.50	0.13	14-Jul	0.75	0.13
4-Aug	2.50	1.50	9-Aug	0.50	0.13	14-Aug	0.75	0.13
4-Sep	2.75	1.50	9-Sep	0.50	0.13	14-Sep	0.75	0.13
4-Oct	2.75	1.75	9-Oct	0.50	0.13	14-Oct	0.75	0.13
4-Nov	3.00	2.00	9-Nov	0.50	0.13	14-Nov	0.75	0.13
4-Dec	3.25	2.25	9-Dec	0.50	0.13	14-Dec	0.75	0.13
5-Jan	3.25	2.25	10-Jan	0.50	0.13	15-Jan	0.75	0.13
5-Feb	3.50	2.50	10-Feb	0.75	0.13	15-Feb	0.75	0.13
5-Mar	3.75	2.50	10-Mar	0.75	0.13	15-Mar	0.75	0.13
5-Apr	3.75	2.75	10-Apr	0.75	0.13	15-Apr	0.75	0.13
5-May	4.00	3.00	10-May	0.75	0.13	15-May	0.75	0.13
5-Jun	4.25	3.00	10-Jun	0.75	0.13	15-Jun	0.75	0.13
5-Jul	4.25	3.25	10-Jul	0.75	0.13	15-Jul	0.75	0.13
5-Aug	4.50	3.50	10-Aug	0.75	0.13	15-Aug	0.75	0.13
5-Sep	4.75	3.75	10-Sep	0.75	0.13	15-Sep	0.75	0.13
5-Oct	4.75	3.75	10-Oct	0.75	0.13	15-Oct	0.75	0.13
5-Nov	5.00	4.00	10-Nov	0.75	0.13	15-Nov	0.75	0.13
5-Dec	5.25	4.25	10-Dec	0.75	0.13	15-Dec	1.00	0.38

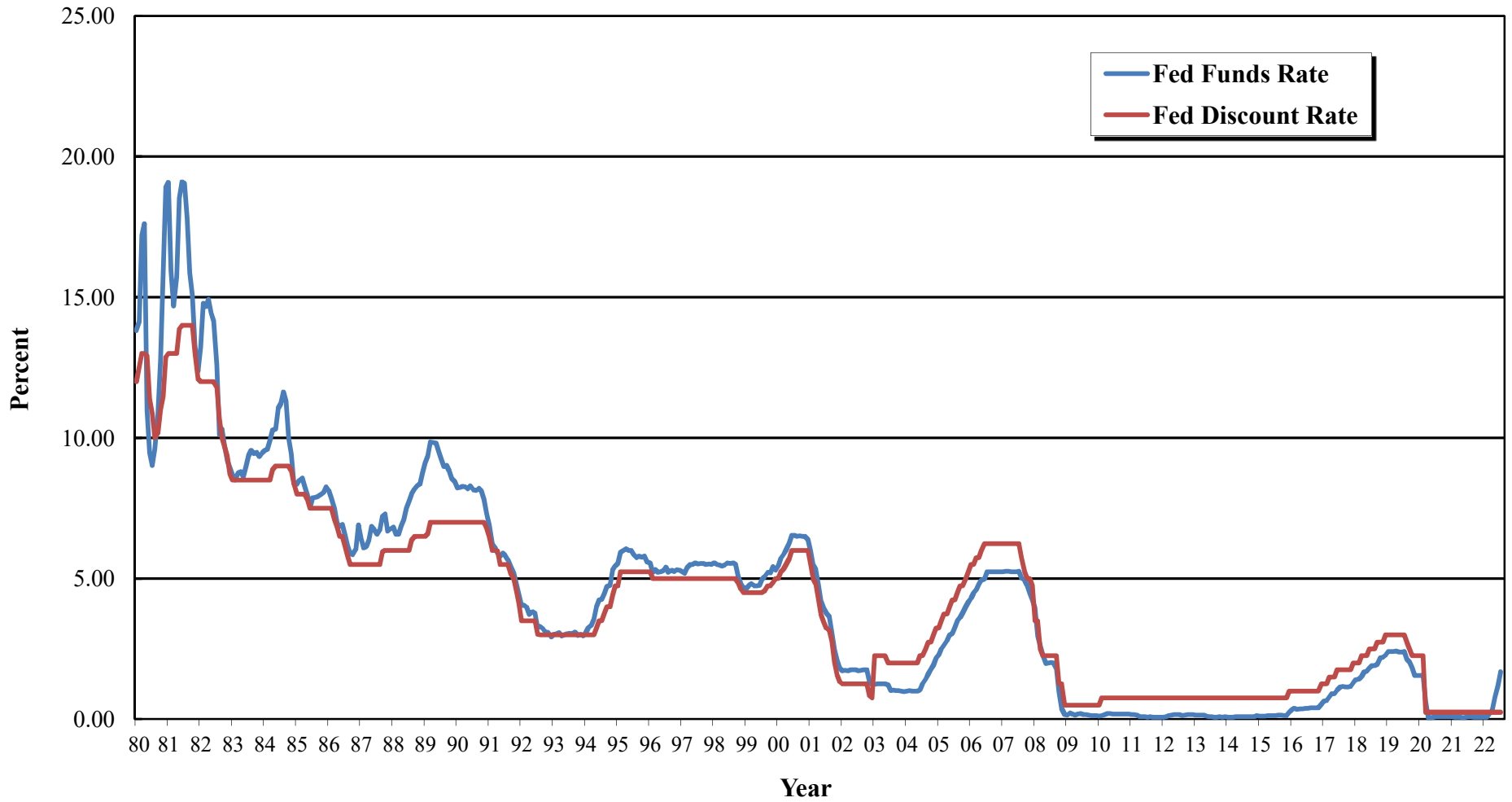
Spire Missouri
Case No. GR-2022-0179

Federal Reserve Discount Rate and Federal Reserve Funds Rate

Federal Reserve			Reserve			Federal Reserve		
Date	Discount Rate	Funds Rate	Date	Discount Rate	Funds Rate	Date	Discount Rate	Funds Rate
16-Jan	1.00	0.38	21-Jan	0.25	0.09			
16-Feb	1.00	0.38	21-Feb	0.25	0.08			
16-Mar	1.00	0.38	21-Mar	0.25	0.07			
16-Apr	1.00	0.38	21-Apr	0.25	0.07			
16-May	1.00	0.38	21-May	0.25	0.06			
16-Jun	1.00	0.38	21-Jun	0.25	0.08			
16-Jul	1.00	0.39	21-Jul	0.25	0.10			
16-Aug	1.00	0.40	21-Aug	0.25	0.09			
16-Sep	1.00	0.40	21-Sep	0.25	0.08			
16-Oct	1.00	0.40	21-Oct	0.25	0.08			
16-Nov	1.00	0.41	21-Nov	0.25	0.08			
16-Dec	1.25	0.54	21-Dec	0.25	0.08			
17-Jan	1.25	0.65	22-Jan	0.25	0.08			
17-Feb	1.25	0.66	22-Feb	0.25	0.08			
17-Mar	1.50	0.79	22-Mar	0.25	0.20			
17-Apr	1.50	0.90	22-Apr	0.25	0.33			
17-May	1.50	0.91	22-May	0.25	0.77			
17-Jun	1.75	1.04	22-Jun	0.25	1.21			
17-Jul	1.75	1.15	22-Jul	0.25	1.68			
17-Aug	1.75	1.16						
17-Sep	1.75	1.15						
17-Oct	1.75	1.15						
17-Nov	1.75	1.16						
17-Dec	2.00	1.30						
18-Jan	2.00	1.41						
18-Feb	2.00	1.42						
18-Mar	2.25	1.51						
18-Apr	2.25	1.69						
18-May	2.25	1.70						
18-Jun	2.50	1.82						
18-Jul	2.50	1.91						
18-Aug	2.50	1.91						
18-Sep	2.75	1.95						
18-Oct	2.75	2.19						
18-Nov	2.75	2.20						
18-Dec	3.00	2.27						
19-Jan	3.00	2.40						
19-Feb	3.00	2.40						
19-Mar	3.00	2.41						
19-Apr	3.00	2.42						
19-May	3.00	2.39						
19-Jun	3.00	2.38						
19-Jul	3.00	2.40						
19-Aug	2.75	2.13						
19-Sep	2.50	2.04						
19-Oct	2.25	1.83						
19-Nov	2.25	1.55						
19-Dec	2.25	1.55						
20-Jan	2.25	1.55						
20-Feb	2.25	1.58						
20-Mar	0.25	0.65						
20-Apr	0.25	0.05						
20-May	0.25	0.05						
20-Jun	0.25	0.08						
20-Jul	0.25	0.09						
20-Aug	0.25	0.10						
20-Sep	0.25	0.09						
20-Oct	0.25	0.09						
20-Nov	0.25	0.09						
20-Dec	0.25	0.09						

THE EMPIRE DISTRICT GAS COMPANY
Case No. GR-2021-0320

Federal Reserve Discount Rates and Federal Funds Rates
1980 - 2022



Spire Missouri
Case No. GR-2022-0179

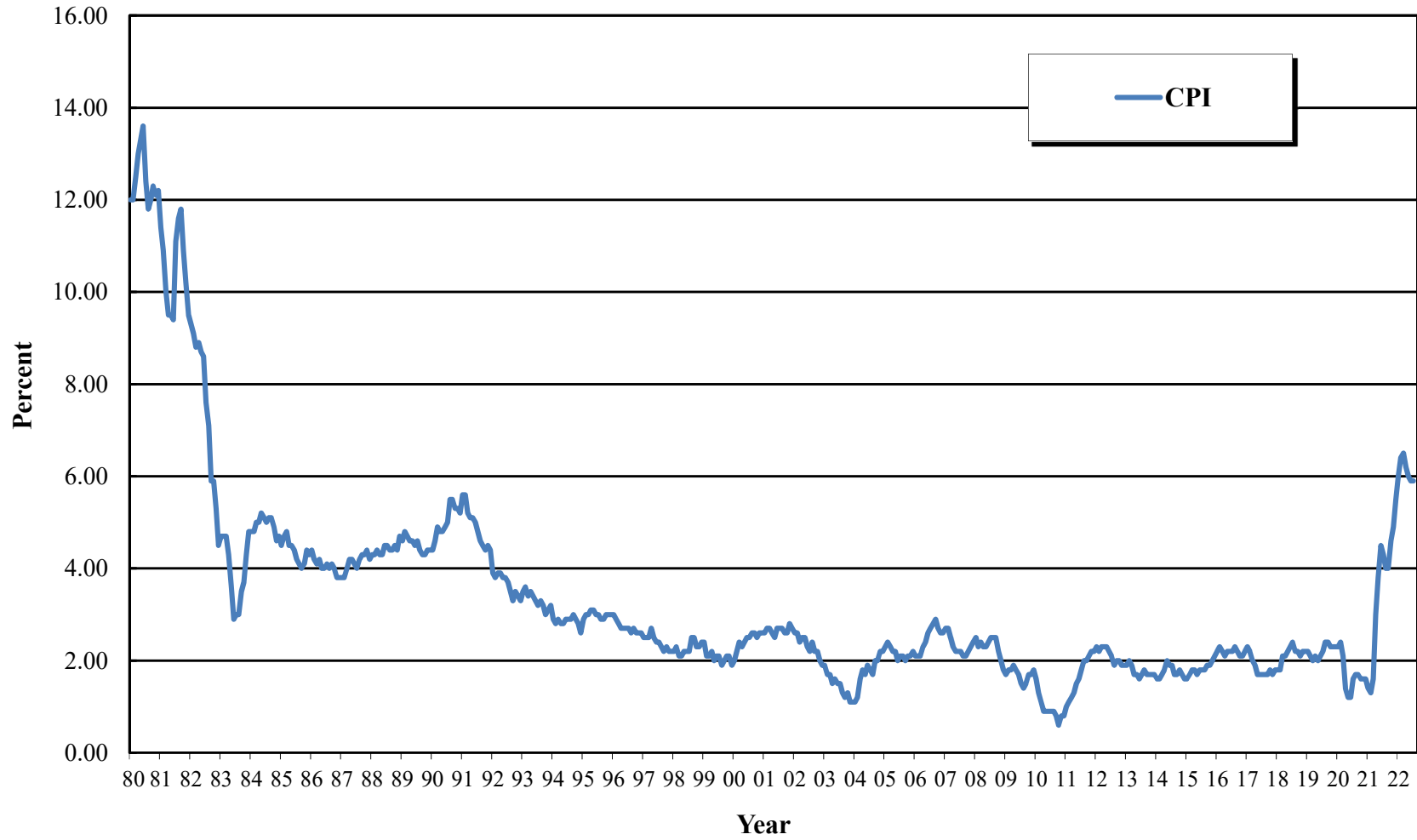
Rate of Inflation

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	12.00	Jan 1987	3.80	Jan 1994	2.90	Jan 2001	2.60	Jan 2008	2.50	Jan 2015	1.60	Jan 2022	6.00
Feb	12.00	Feb	3.80	Feb	2.80	Feb	2.70	Feb	2.30	Feb	1.70	Feb	6.40
Mar	12.50	Mar	4.00	Mar	2.90	Mar	2.70	Mar	2.40	Mar	1.80	Mar	6.50
Apr	13.00	Apr	4.20	Apr	2.80	Apr	2.60	Apr	2.30	Apr	1.80	Apr	6.20
May	13.30	May	4.20	May	2.80	May	2.50	May	2.30	May	1.70	May	6.00
Jun	13.60	Jun	4.10	Jun	2.90	Jun	2.70	Jun	2.40	Jun	1.80	Jun	5.90
Jul	12.40	Jul	4.00	Jul	2.90	Jul	2.70	Jul	2.50	Jul	1.80	Jul	5.90
Aug	11.80	Aug	4.20	Aug	2.90	Aug	2.70	Aug	2.50	Aug	1.80	Aug	
Sep	12.00	Sep	4.30	Sep	3.00	Sep	2.60	Sep	2.50	Sep	1.90	Sep	
Oct	12.30	Oct	4.30	Oct	2.90	Oct	2.60	Oct	2.20	Oct	1.90	Oct	
Nov	12.10	Nov	4.40	Nov	2.80	Nov	2.80	Nov	2.00	Nov	2.00	Nov	
Dec	12.20	Dec	4.20	Dec	2.60	Dec	2.70	Dec	1.80	Dec	2.10	Dec	
Jan 1981	11.40	Jan 1988	4.30	Jan 1995	2.90	Jan 2002	2.60	Jan 2009	1.70	Jan 2016	2.20		
Feb	10.90	Feb	4.30	Feb	3.00	Feb	2.60	Feb	1.80	Feb	2.30		
Mar	10.00	Mar	4.40	Mar	3.00	Mar	2.40	Mar	1.80	Mar	2.20		
Apr	9.50	Apr	4.30	Apr	3.10	Apr	2.50	Apr	1.90	Apr	2.10		
May	9.50	May	4.30	May	3.10	May	2.50	May	1.80	May	2.20		
Jun	9.40	Jun	4.50	Jun	3.00	Jun	2.30	Jun	1.70	Jun	2.20		
Jul	11.10	Jul	4.50	Jul	3.00	Jul	2.20	Jul	1.50	Jul	2.20		
Aug	11.60	Aug	4.40	Aug	2.90	Aug	2.40	Aug	1.40	Aug	2.30		
Sep	11.80	Sep	4.40	Sep	2.90	Sep	2.20	Sep	1.50	Sep	2.20		
Oct	10.90	Oct	4.50	Oct	3.00	Oct	2.20	Oct	1.70	Oct	2.10		
Nov	10.20	Nov	4.40	Nov	3.00	Nov	2.00	Nov	1.70	Nov	2.10		
Dec	9.50	Dec	4.70	Dec	3.00	Dec	1.90	Dec	1.80	Dec	2.20		
Jan 1982	9.30	Jan 1989	4.60	Jan 1996	3.00	Jan 2003	1.90	Jan 2010	1.60	Jan 2017	2.30		
Feb	9.10	Feb	4.80	Feb	2.90	Feb	1.70	Feb	1.30	Feb	2.20		
Mar	8.80	Mar	4.70	Mar	2.80	Mar	1.70	Mar	1.10	Mar	2.00		
Apr	8.90	Apr	4.60	Apr	2.70	Apr	1.50	April	0.90	Apr	1.90		
May	8.70	May	4.60	May	2.70	May	1.60	May	0.90	May	1.70		
Jun	8.60	Jun	4.50	Jun	2.70	Jun	1.50	Jun	0.90	Jun	1.70		
Jul	7.60	Jul	4.60	Jul	2.70	Jul	1.50	Jul	0.90	July	1.70		
Aug	7.10	Aug	4.40	Aug	2.60	Aug	1.30	Aug	0.90	Aug	1.70		
Sep	5.90	Sep	4.30	Sep	2.70	Sep	1.20	Sep	0.80	Sep	1.70		
Oct	5.90	Oct	4.30	Oct	2.60	Oct	1.30	Oct	0.60	Oct	1.80		
Nov	5.30	Nov	4.40	Nov	2.60	Nov	1.10	Nov	0.80	Nov	1.70		
Dec	4.50	Dec	4.40	Dec	2.60	Dec	1.10	Dec	0.80	Dec	1.80		
Jan 1983	4.70	Jan 1990	4.40	Jan 1997	2.50	Jan 2004	1.10	Jan 2011	1.00	Jan 2018	1.80		
Feb	4.70	Feb	4.60	Feb	2.50	Feb	1.20	Feb	1.10	Feb	1.80		
Mar	4.70	Mar	4.90	Mar	2.50	Mar	1.60	Mar	1.20	Mar	2.10		
Apr	4.30	Apr	4.80	Apr	2.70	Apr	1.80	Apr	1.30	Apr	2.10		
May	3.60	May	4.80	May	2.50	May	1.70	May	1.50	May	2.20		
Jun	2.90	Jun	4.90	Jun	2.40	Jun	1.90	Jun	1.60	Jun	2.30		
Jul	3.00	Jul	5.00	Jul	2.40	Jul	1.80	Jul	1.80	Jul	2.40		
Aug	3.00	Aug	5.50	Aug	2.30	Aug	1.70	Aug	2.00	Aug	2.20		
Sep	3.50	Sep	5.50	Sep	2.20	Sep	2.00	Sep	2.00	Sep	2.20		
Oct	3.70	Oct	5.30	Oct	2.30	Oct	2.00	Oct	2.10	Oct	2.10		
Nov	4.30	Nov	5.30	Nov	2.20	Nov	2.20	Nov	2.20	Nov	2.20		
Dec	4.80	Dec	5.20	Dec	2.20	Dec	2.20	Dec	2.20	Dec	2.20		
Jan 1984	4.80	Jan 1991	5.60	Jan 1998	2.20	Jan 2005	2.30	Jan 2012	2.30	Jan 2019	2.20		
Feb	4.80	Feb	5.60	Feb	2.30	Feb	2.40	Feb	2.20	Feb	2.10		
Mar	5.00	Mar	5.20	Mar	2.10	Mar	2.30	Mar	2.30	Mar	2.00		
Apr	5.00	Apr	5.10	Apr	2.10	Apr	2.20	Apr	2.30	Apr	2.10		
May	5.20	May	5.10	May	2.20	May	2.20	May	2.30	May	2.00		
Jun	5.10	Jun	5.00	Jun	2.20	Jun	2.00	Jun	2.20	Jun	2.10		
Jul	5.00	Jul	4.80	Jul	2.20	Jul	2.10	Jul	2.10	Jul	2.20		
Aug	5.10	Aug	4.60	Aug	2.50	Aug	2.10	Aug	1.90	Aug	2.40		
Sep	5.10	Sep	4.50	Sep	2.50	Sep	2.00	Sep	2.00	Sept	2.40		
Oct	4.90	Oct	4.40	Oct	2.30	Oct	2.10	Oct	2.00	Oct	2.30		
Nov	4.60	Nov	4.50	Nov	2.30	Nov	2.10	Nov	1.90	Nov	2.30		
Dec	4.70	Dec	4.40	Dec	2.40	Dec	2.20	Dec	1.90	Dec	2.30		
Jan 1985	4.50	Jan 1992	3.90	Jan 1999	2.40	Jan 2006	2.10	Jan 2013	1.90	Jan 2020	2.30		
Feb	4.70	Feb	3.80	Feb	2.10	Feb	2.10	Feb	2.00	Feb	2.40		
Mar	4.80	Mar	3.90	Mar	2.10	Mar	2.10	Mar	1.90	Mar	2.10		
Apr	4.50	Apr	3.90	Apr	2.20	Apr	2.30	Apr	1.70	Apr	1.40		
May	4.50	May	3.80	May	2.00	May	2.40	May	1.70	May	1.20		
Jun	4.40	Jun	3.80	Jun	2.10	June	2.60	Jun	1.60	Jun	1.20		
Jul	4.20	Jul	3.70	Jul	2.10	July	2.70	Jul	1.70	Jul	1.60		
Aug	4.10	Aug	3.50	Aug	1.90	Aug	2.80	Aug	1.80	Aug	1.70		
Sep	4.00	Sep	3.30	Sep	2.00	Sep	2.90	Sept	1.70	Sep	1.70		
Oct	4.10	Oct	3.50	Oct	2.10	Oct	2.70	Oct	1.70	Oct	1.60		
Nov	4.40	Nov	3.40	Nov	2.10	Nov	2.60	Nov	1.70	Nov	1.60		
Dec	4.30	Dec	3.30	Dec	1.90	Dec	2.60	Dec	1.70	Dec	1.60		
Jan 1986	4.40	Jan 1993	3.50	Jan 2000	2.00	Jan 2007	2.70	Jan 2014	1.60	Jan 2021	1.40		
Feb	4.20	Feb	3.60	Feb	2.20	Feb	2.70	Feb	1.60	Feb	1.30		
Mar	4.10	Mar	3.40	Mar	2.40	Mar	2.50	Mar	1.70	Mar	1.60		
Apr	4.20	Apr	3.50	Apr	2.30	Apr	2.30	Apr	1.80	Apr	3.00		
May	4.00	May	3.40	May	2.40	May	2.20	May	2.00	May	3.80		
Jun	4.00	Jun	3.30	Jun	2.50	Jun	2.20	Jun	1.90	Jun	4.50		
Jul	4.10	Jul	3.20	Jul	2.50	Jul	2.20	Jul	1.90	Jul	4.30		
Aug	4.00	Aug	3.30	Aug	2.60	Aug	2.10	Aug	1.70	Aug	4.00		
Sep	4.10	Sep	3.20	Sep	2.60	Sep	2.10	Sep	1.70	Sep	4.00		
Oct	4.00	Oct	3.00	Oct	2.50	Oct	2.20	Oct	1.80	Oct	4.60		
Nov	3.80	Nov	3.10	Nov	2.60	Nov	2.30	Nov	1.70	Nov	4.90		
Dec	3.80	Dec	3.20	Dec	2.60	Dec	2.40	Dec	1.60	Dec	5.50		

Source: U.S. Dept. of Labor, Bureau of Labor Statistics, Consumer Price Index - All Urban Consumers less food and energy, Change for 12-Month Period, Bureau of Labor Statistics, <https://www.bls.gov/cpi/data.htm>

THE EMPIRE DISTRICT GAS COMPANY
Case No. GR-2021-0320

Rate of Inflation
1980 - 2022



Spire Missouri
Case No. GR-2022-0179

Average Yields on Moody's Public Utility Bonds

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 1987	8.77	Jan 1994	7.31	Jan 2001	7.76	Jan 2008	6.08	Jan 2015	3.83	Jan 2022	3.46
Feb	13.48	Feb	8.81	Feb	7.44	Feb	7.69	Feb	6.28	Feb	3.91	Feb	3.73
Mar	14.33	Mar	8.75	Mar	7.83	Mar	7.59	Mar	6.29	Mar	3.97	Mar	4.02
Apr	13.50	Apr	9.30	Apr	8.20	Apr	7.81	Apr	6.36	Apr	3.96	Apr	4.34
May	12.17	May	9.82	May	8.32	May	7.88	May	6.38	May	4.38	May	4.79
Jun	11.87	Jun	9.87	Jun	8.31	Jun	7.75	Jun	6.50	Jun	4.60	Jun	4.91
Jul	12.12	Jul	10.01	Jul	8.47	Jul	7.71	Jul	6.50	Jul	4.63	Jul	4.84
Aug	12.82	Aug	10.33	Aug	8.41	Aug	7.57	Aug	6.48	Aug	4.54	Aug	
Sep	13.29	Sep	11.00	Sep	8.65	Sep	7.73	Sep	6.59	Sep	4.68	Sep	
Oct	13.53	Oct	11.32	Oct	8.88	Oct	7.64	Oct	7.70	Oct	4.63	Oct	
Nov	14.07	Nov	10.82	Nov	9.00	Nov	7.61	Nov	7.80	Nov	4.73	Nov	
Dec	14.48	Dec	10.99	Dec	8.79	Dec	7.86	Dec	6.87	Dec	4.69	Dec	
Jan 1981	14.22	Jan 1988	10.75	Jan 1995	8.77	Jan 2002	7.69	Jan 2009	6.77	Jan 2016	4.62		
Feb	14.84	Feb	10.11	Feb	8.56	Feb	7.62	Feb	6.72	Feb	4.44		
Mar	14.86	Mar	10.11	Mar	8.41	Mar	7.83	Mar	6.85	Mar	4.40		
Apr	15.32	Apr	10.53	Apr	8.30	Apr	7.74	Apr	6.90	Apr	4.16		
May	15.84	May	10.75	May	7.93	May	7.76	May	6.83	May	4.06		
Jun	15.27	Jun	10.71	Jun	7.62	Jun	7.67	Jun	6.54	Jun	3.93		
Jul	15.87	Jul	10.96	Jul	7.73	Jul	7.54	Jul	6.15	Jul	3.70		
Aug	16.33	Aug	11.09	Aug	7.86	Aug	7.34	Aug	5.80	Aug	3.73		
Sep	16.89	Sep	10.56	Sep	7.62	Sep	7.23	Sep	5.60	Sep	3.80		
Oct	16.76	Oct	9.92	Oct	7.46	Oct	7.43	Oct	5.64	Oct	3.90		
Nov	15.50	Nov	9.89	Nov	7.40	Nov	7.31	Nov	5.71	Nov	4.21		
Dec	15.77	Dec	10.02	Dec	7.21	Dec	7.20	Dec	5.86	Dec	4.39		
Jan 1982	16.73	Jan 1989	10.02	Jan 1996	7.20	Jan 2003	7.13	Jan 2010	5.83	Jan 2017	4.24		
Feb	16.72	Feb	10.02	Feb	7.37	Feb	6.92	Feb	5.94	Feb	4.25		
Mar	16.07	Mar	10.16	Mar	7.72	Mar	6.80	Mar	5.90	Mar	4.30		
Apr	15.82	Apr	10.14	Apr	7.88	Apr	6.68	April	5.87	Apr	4.19		
May	15.60	May	9.92	May	7.99	May	6.35	May	5.59	May	4.19		
Jun	16.18	Jun	9.49	Jun	8.07	Jun	6.21	Jun	5.62	Jun	4.01		
Jul	16.04	Jul	9.34	Jul	8.02	Jul	6.54	Jul	5.41	July	4.06		
Aug	15.22	Aug	9.37	Aug	7.84	Aug	6.78	Aug	5.10	Aug	3.92		
Sep	14.56	Sep	9.43	Sep	8.01	Sep	6.58	Sep	5.10	Sep	3.93		
Oct	13.88	Oct	9.37	Oct	7.76	Oct	6.50	Oct	5.20	Oct	3.97		
Nov	13.58	Nov	9.33	Nov	7.48	Nov	6.44	Nov	5.45	Nov	3.88		
Dec	13.55	Dec	9.31	Dec	7.58	Dec	6.35	Dec	5.64	Dec	3.85		
Jan 1983	13.46	Jan 1990	9.44	Jan 1997	7.79	Jan 2004	6.23	Jan 2011	5.64	Jan 2018	3.91		
Feb	13.60	Feb	9.66	Feb	7.68	Feb	6.17	Feb	5.73	Feb	4.15		
Mar	13.28	Mar	9.75	Mar	7.92	Mar	6.01	Mar	5.62	Mar	4.21		
Apr	13.03	Apr	9.87	Apr	8.08	Apr	6.38	Apr	5.62	Apr	4.24		
May	13.00	May	9.89	May	7.94	May	6.68	May	5.38	May	4.36		
Jun	13.17	Jun	9.69	Jun	7.77	Jun	6.53	Jun	5.32	Jun	4.37		
Jul	13.28	Jul	9.66	Jul	7.52	Jul	6.34	Jul	5.34	Jul	4.35		
Aug	13.50	Aug	9.84	Aug	7.57	Aug	6.18	Aug	4.78	Aug	4.33		
Sep	13.35	Sep	10.01	Sep	7.50	Sep	6.01	Sep	4.61	Sep	4.41		
Oct	13.19	Oct	9.94	Oct	7.37	Oct	5.95	Oct	4.66	Oct	4.56		
Nov	13.33	Nov	9.76	Nov	7.24	Nov	5.97	Nov	4.37	Nov	4.65		
Dec	13.48	Dec	9.57	Dec	7.16	Dec	5.93	Dec	4.47	Dec	4.51		
Jan 1984	13.40	Jan 1991	9.56	Jan 1998	7.03	Jan 2005	5.80	Jan 2012	4.48	Jan 2019	4.48		
Feb	13.50	Feb	9.31	Feb	7.09	Feb	5.64	Feb	4.47	Feb	4.35		
Mar	14.03	Mar	9.39	Mar	7.13	Mar	5.86	Mar	4.59	Mar	4.26		
Apr	14.30	Apr	9.30	Apr	7.12	Apr	5.72	Apr	4.54	Apr	4.18		
May	14.95	May	9.29	May	7.11	May	5.60	May	4.36	May	4.10		
Jun	15.16	Jun	9.44	Jun	6.99	Jun	5.39	Jun	4.26	Jun	3.93		
Jul	14.92	Jul	9.40	Jul	6.99	Jul	5.50	Jul	4.12	Jul	3.79		
Aug	14.29	Aug	9.16	Aug	6.96	Aug	5.51	Aug	4.18	Aug	3.36		
Sep	14.04	Sep	9.03	Sep	6.88	Sep	5.54	Sep	4.17	Sept	3.44		
Oct	13.68	Oct	8.99	Oct	6.88	Oct	5.79	Oct	4.04	Oct	3.45		
Nov	13.15	Nov	8.93	Nov	6.96	Nov	5.88	Nov	3.95	Nov	3.48		
Dec	12.96	Dec	8.76	Dec	6.84	Dec	5.83	Dec	4.10	Dec	3.45		
Jan 1985	12.88	Jan 1992	8.67	Jan 1999	6.87	Jan 2006	5.77	Jan 2013	4.24	Jan 2020	3.34		
Feb	13.00	Feb	8.77	Feb	7.00	Feb	5.83	Feb	4.29	Feb	3.16		
Mar	13.66	Mar	8.84	Mar	7.18	Mar	5.98	Mar	4.29	Mar	3.59		
Apr	13.42	Apr	8.79	Apr	7.16	Apr	6.28	Apr	4.08	Apr	3.31		
May	12.89	May	8.72	May	7.42	May	6.39	May	4.24	May	3.22		
Jun	11.91	Jun	8.64	Jun	7.70	June	6.39	Jun	4.63	Jun	3.10		
Jul	11.88	Jul	8.46	Jul	7.66	July	6.37	Jul	4.78	Jul	2.77		
Aug	11.93	Aug	8.34	Aug	7.86	Aug	6.20	Aug	4.85	Aug	2.76		
Sep	11.95	Sep	8.32	Sep	7.87	Sep	6.03	Sept	4.90	Sep	2.88		
Oct	11.84	Oct	8.44	Oct	8.02	Oct	6.01	Oct	4.78	Oct	2.98		
Nov	11.33	Nov	8.53	Nov	7.86	Nov	5.82	Nov	4.86	Nov	2.89		
Dec	10.82	Dec	8.36	Dec	8.04	Dec	5.83	Dec	4.88	Dec	2.80		
Jan 1986	10.66	Jan 1993	8.23	Jan 2000	8.22	Jan 2007	5.96	Jan 2014	4.72	Jan 2021	2.94		
Feb	10.16	Feb	8.00	Feb	8.10	Feb	5.91	Feb	4.64	Feb	3.13		
Mar	9.33	Mar	7.85	Mar	8.14	Mar	5.87	Mar	4.64	Mar	3.48		
Apr	9.02	Apr	7.76	Apr	8.14	Apr	6.01	Apr	4.52	Apr	3.33		
May	9.52	May	7.78	May	8.56	May	6.03	May	4.37	May	3.36		
Jun	9.51	Jun	7.68	Jun	8.22	Jun	6.34	Jun	4.42	Jun	3.19		
Jul	9.19	Jul	7.53	Jul	8.17	Jul	6.28	Jul	4.35	Jul	2.99		
Aug	9.15	Aug	7.21	Aug	8.06	Aug	6.28	Aug	4.28	Aug	2.99		
Sep	9.42	Sep	7.01	Sep	8.15	Sep	6.24	Sep	4.40	Sep	3.00		
Oct	9.39	Oct	6.99	Oct	8.08	Oct	6.17	Oct	4.24	Oct	3.13		
Nov	9.15	Nov	7.30	Nov	8.03	Nov	6.04	Nov	4.29	Nov	3.06		
Dec	8.96	Dec	7.33	Dec	7.79	Dec	6.23	Dec	4.18	Dec	3.17		

Source:
<https://fred.stlouisfed.org/series/DBAA>

Spire Missouri
Case No. GR-2022-0179

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

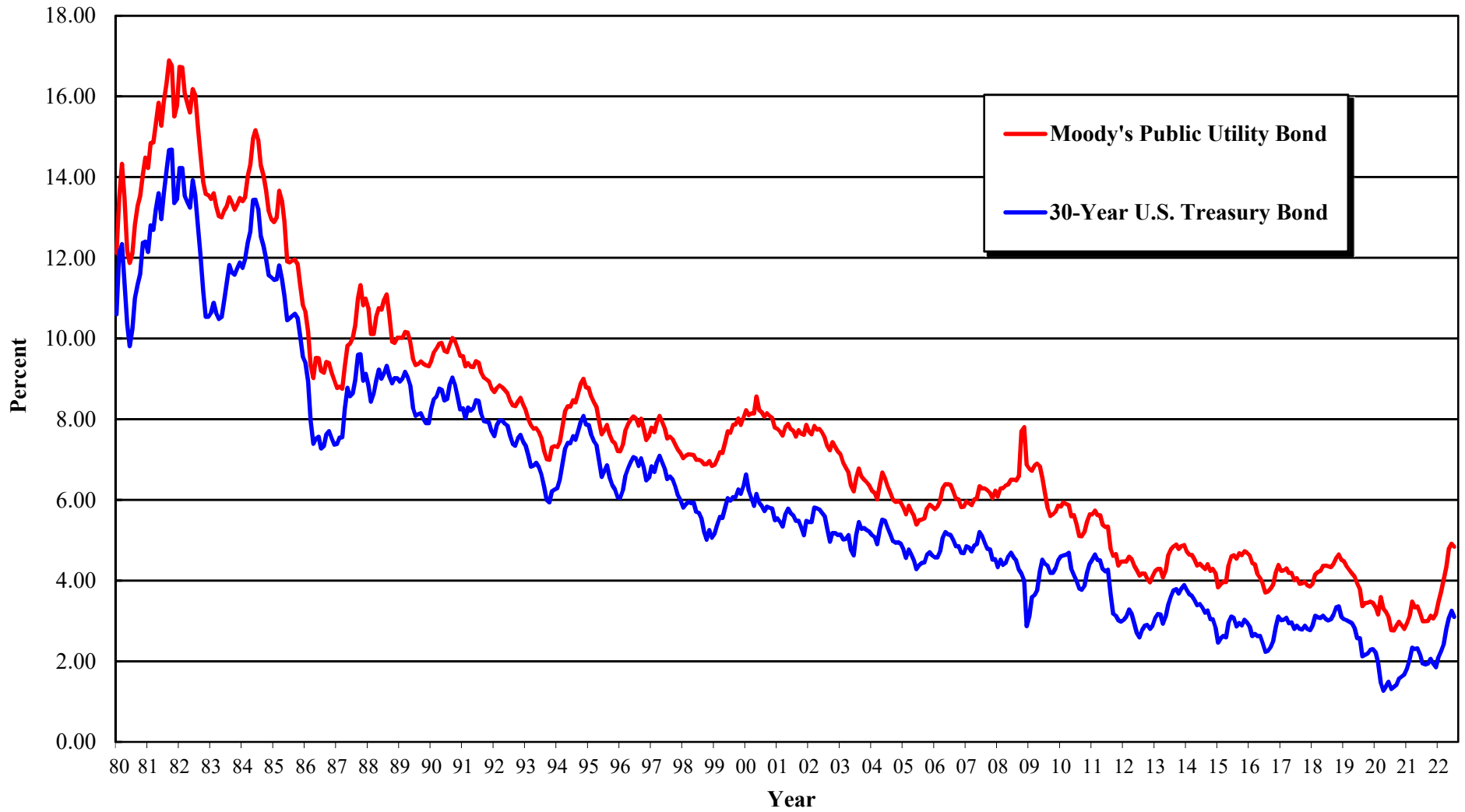
Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1980	10.60	Jan 1987	7.39	Jan 1994	6.29	Jan 2001	5.54	Jan 2008	4.33	Jan 2015	2.46	Jan 2022	2.10
Feb	12.13	Feb	7.54	Feb	6.49	Feb	5.45	Feb	4.52	Feb	2.57	Feb	2.25
Mar	12.34	Mar	7.55	Mar	6.91	Mar	5.34	Mar	4.39	Mar	2.63	Mar	2.41
Apr	11.40	Apr	8.25	Apr	7.27	Apr	5.65	Apr	4.44	Apr	2.59	Apr	2.81
May	10.36	May	8.78	May	7.41	May	5.78	May	4.60	May	2.96	May	3.07
Jun	9.81	Jun	8.57	Jun	7.40	Jun	5.67	Jun	4.69	Jun	3.11	Jun	3.25
Jul	10.24	Jul	8.64	Jul	7.58	Jul	5.61	Jul	4.57	Jul	3.07	Jul	3.10
Aug	11.00	Aug	8.97	Aug	7.49	Aug	5.48	Aug	4.50	Aug	2.86	Aug	
Sep	11.34	Sep	9.59	Sep	7.71	Sep	5.48	Sep	4.27	Sep	2.95	Sep	
Oct	11.59	Oct	9.61	Oct	7.94	Oct	5.32	Oct	4.17	Oct	2.89	Oct	
Nov	12.37	Nov	8.95	Nov	8.08	Nov	5.12	Nov	4.00	Nov	3.03	Nov	
Dec	12.40	Dec	9.12	Dec	7.87	Dec	5.48	Dec	2.87	Dec	2.97	Dec	
Jan 1981	12.14	Jan 1988	8.83	Jan 1995	7.85	Jan 2002	5.45	Jan 2009	3.13	Jan 2016	2.86		
Feb	12.80	Feb	8.43	Feb	7.61	Feb	5.45	Feb	3.59	Feb	2.62		
Mar	12.69	Mar	8.63	Mar	7.45	Mar	5.81	Mar	3.64	Mar	2.68		
Apr	13.20	Apr	8.95	Apr	7.36	Apr	5.79	Apr	3.76	Apr	2.62		
May	13.60	May	9.23	May	6.95	May	5.76	May	4.23	May	2.63		
Jun	12.96	Jun	9.00	Jun	6.57	Jun	5.68	Jun	4.52	Jun	2.45		
Jul	13.59	Jul	9.14	Jul	6.72	Jul	5.59	Jul	4.41	Jul	2.23		
Aug	14.17	Aug	9.32	Aug	6.86	Aug	5.28	Aug	4.37	Aug	2.26		
Sep	14.67	Sep	9.06	Sep	6.55	Sep	4.96	Sep	4.19	Sep	2.35		
Oct	14.68	Oct	8.89	Oct	6.37	Oct	5.18	Oct	4.19	Oct	2.50		
Nov	13.35	Nov	9.02	Nov	6.26	Nov	5.18	Nov	4.31	Nov	2.86		
Dec	13.45	Dec	9.01	Dec	6.06	Dec	5.13	Dec	4.49	Dec	3.11		
Jan 1982	14.22	Jan 1989	8.93	Jan 1996	6.05	Jan 2003	5.14	Jan 2010	4.60	Jan 2017	3.02		
Feb	14.22	Feb	9.01	Feb	6.24	Feb	5.02	Feb	4.62	Feb	3.03		
Mar	13.53	Mar	9.17	Mar	6.60	Mar	5.03	Mar	4.64	Mar	3.08		
Apr	13.37	Apr	9.03	Apr	6.79	Apr	5.13	April	4.69	Apr	2.94		
May	13.24	May	8.83	May	6.93	May	4.76	May	4.29	May	2.96		
Jun	13.92	Jun	8.27	Jun	7.06	Jun	4.62	Jun	4.13	Jun	2.80		
Jul	13.55	Jul	8.08	Jul	7.03	Jul	5.13	Jul	3.99	July	2.88		
Aug	12.77	Aug	8.12	Aug	6.84	Aug	5.45	Aug	3.80	Aug	2.80		
Sep	12.07	Sep	8.15	Sep	7.03	Sep	5.28	Sep	3.77	Sep	2.78		
Oct	11.17	Oct	8.00	Oct	6.81	Oct	5.30	Oct	3.87	Oct	2.88		
Nov	10.54	Nov	7.90	Nov	6.48	Nov	5.25	Nov	4.19	Nov	2.80		
Dec	10.54	Dec	7.90	Dec	6.55	Dec	5.21	Dec	4.42	Dec	2.77		
Jan 1983	10.63	Jan 1990	8.26	Jan 1997	6.83	Jan 2004	5.13	Jan 2011	4.52	Jan 2018	2.88		
Feb	10.88	Feb	8.50	Feb	6.69	Feb	5.08	Feb	4.65	Feb	3.13		
Mar	10.63	Mar	8.56	Mar	6.93	Mar	4.90	Mar	4.51	Mar	3.09		
Apr	10.48	Apr	8.76	Apr	7.09	Apr	5.28	Apr	4.50	Apr	3.07		
May	10.53	May	8.73	May	6.94	May	5.51	May	4.29	May	3.13		
Jun	10.93	Jun	8.46	Jun	6.77	Jun	5.48	Jun	4.23	Jun	3.05		
Jul	11.40	Jul	8.50	Jul	6.51	Jul	5.31	Jul	4.27	Jul	3.01		
Aug	11.82	Aug	8.86	Aug	6.58	Aug	5.15	Aug	3.65	Aug	3.04		
Sep	11.63	Sep	9.03	Sep	6.50	Sep	4.98	Sep	3.18	Sep	3.15		
Oct	11.58	Oct	8.86	Oct	6.33	Oct	4.94	Oct	3.13	Oct	3.34		
Nov	11.75	Nov	8.54	Nov	6.11	Nov	4.95	Nov	3.02	Nov	3.36		
Dec	11.88	Dec	8.24	Dec	5.99	Dec	4.91	Dec	2.98	Dec	3.10		
Jan 1984	11.75	Jan 1991	8.27	Jan 1998	5.81	Jan 2005	4.77	Jan 2012	3.03	Jan 2019	3.04		
Feb	11.95	Feb	8.03	Feb	5.89	Feb	4.56	Feb	3.11	Feb	3.02		
Mar	12.38	Mar	8.29	Mar	5.95	Mar	4.77	Mar	3.28	Mar	2.98		
Apr	12.65	Apr	8.21	Apr	5.92	Apr	4.65	Apr	3.18	Apr	2.94		
May	13.43	May	8.27	May	5.93	May	4.49	May	2.93	May	2.82		
Jun	13.44	Jun	8.47	Jun	5.70	Jun	4.28	Jun	2.70	Jun	2.57		
Jul	13.21	Jul	8.45	Jul	5.68	Jul	4.38	Jul	2.59	Jul	2.57		
Aug	12.54	Aug	8.14	Aug	5.54	Aug	4.44	Aug	2.77	Aug	2.12		
Sep	12.29	Sep	7.95	Sep	5.20	Sep	4.45	Sep	2.88	Sept	2.16		
Oct	11.98	Oct	7.93	Oct	5.01	Oct	4.64	Oct	2.90	Oct	2.19		
Nov	11.56	Nov	7.92	Nov	5.25	Nov	4.70	Nov	2.80	Nov	2.28		
Dec	11.52	Dec	7.70	Dec	5.06	Dec	4.62	Dec	2.88	Dec	2.30		
Jan 1985	11.45	Jan 1992	7.58	Jan 1999	5.16	Jan 2006	4.57	Jan 2013	3.08	Jan 2020	2.22		
Feb	11.47	Feb	7.85	Feb	5.37	Feb	4.57	Feb	3.17	Feb	1.97		
Mar	11.81	Mar	7.97	Mar	5.58	Mar	4.73	Mar	3.16	Mar	1.46		
Apr	11.47	Apr	7.96	Apr	5.55	Apr	5.06	Apr	2.93	Apr	1.27		
May	11.05	May	7.89	May	5.81	May	5.20	May	3.11	May	1.38		
Jun	10.45	Jun	7.84	Jun	6.04	June	5.15	Jun	3.40	Jun	1.49		
Jul	10.50	Jul	7.60	Jul	5.98	July	5.13	Jul	3.61	Jul	1.31		
Aug	10.56	Aug	7.39	Aug	6.07	Aug	5.00	Aug	3.76	Aug	1.36		
Sep	10.61	Sep	7.34	Sep	6.07	Sep	4.85	Sept	3.79	Sep	1.42		
Oct	10.50	Oct	7.53	Oct	6.26	Oct	4.85	Oct	3.68	Oct	1.57		
Nov	10.06	Nov	7.61	Nov	6.15	Nov	4.69	Nov	3.80	Nov	1.62		
Dec	9.54	Dec	7.44	Dec	6.35	Dec	4.68	Dec	3.89	Dec	1.67		
Jan 1986	9.40	Jan 1993	7.34	Jan 2000	6.63	Jan 2007	4.85	Jan 2014	3.77	Jan 2021	1.82		
Feb	8.93	Feb	7.09	Feb	6.23	Feb	4.82	Feb	3.66	Feb	2.04		
Mar	7.96	Mar	6.82	Mar	6.05	Mar	4.72	Mar	3.62	Mar	2.34		
Apr	7.39	Apr	6.85	Apr	5.85	Apr	4.87	Apr	3.52	Apr	2.30		
May	7.52	May	6.92	May	6.15	May	4.90	May	3.39	May	2.32		
Jun	7.57	Jun	6.81	Jun	5.93	Jun	5.20	Jun	3.42	Jun	2.16		
Jul	7.27	Jul	6.63	Jul	5.85	Jul	5.11	Jul	3.33	Jul	1.94		
Aug	7.33	Aug	6.32	Aug	5.72	Aug	4.93	Aug	3.20	Aug	1.92		
Sep	7.62	Sep	6.00	Sep	5.83	Sep	4.79	Sep	3.26	Sep	1.94		
Oct	7.70	Oct	5.94	Oct	5.80	Oct	4.77	Oct	3.04	Oct	2.06		
Nov	7.52	Nov	6.21	Nov	5.78	Nov	4.52	Nov	3.04	Nov	1.94		
Dec	7.37	Dec	6.25	Dec	5.49	Dec	4.53	Dec	2.83	Dec	1.85		

Sources:

<http://research.stlouisfed.org/fred2/data/GS30.txt>

THE EMPIRE DISTRICT GAS COMPANY
Case No. GR-2021-0320

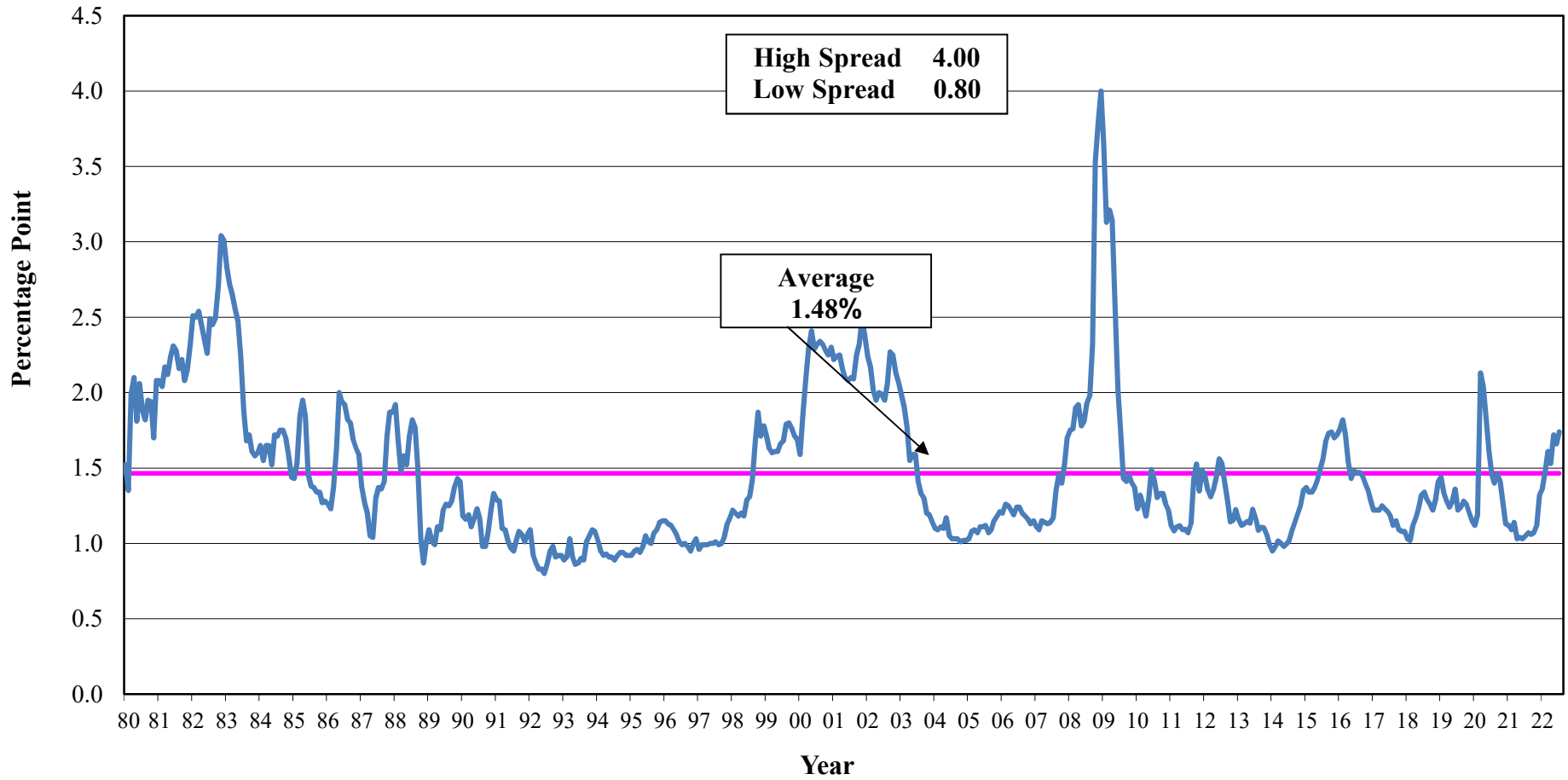
**Average Yields on Mergent's Public Utility Bonds and
Thirty-Year U.S. Treasury Bonds (1980 - 2022)**



THE EMPIRE DISTRICT GAS COMPANY

Case No. GR-2021-0320

**Monthly Spreads Between Yields on Moody's Public Utility Bonds and
30-Year U.S. Treasury Bonds (1980 - 2022)**



THE EMPIRE DISTRICT GAS COMPANY
Case No. GR-2021-0320

Average Yields on A and BBB rated Utility Bonds
(2015- 2022)



Spire Missouri
Case No. GR-2022-0179

**Historical Consolidated Capital Structures for
Spire Inc.**

(Dollars in Millions)

<u>Capital Components</u>	<u>March 31, 2019</u>	<u>June 30, 2019</u>	<u>September 30, 2019</u>	<u>December 31, 2019</u>
Common Equity	\$2,406.0	\$2,370.6	\$2,301.0	\$2,344.0
Preferred Stock	\$242.0	\$242.0	\$242.0	\$242.0
Long-Term Debt	\$2,041.9	\$2,042.3	\$2,082.6	\$2,484.4
	<u>\$4,689.9</u>	<u>\$4,654.9</u>	<u>\$4,625.6</u>	<u>\$5,070.4</u>
<u>Capital Components</u>	<u>March 31, 2020</u>	<u>June 30, 2020</u>	<u>September 30, 2020</u>	<u>December 31, 2020</u>
Common Equity	\$2,423.6	\$2,316.4	\$2,280.3	\$2,344.8
Preferred Stock	\$242.0	\$242.0	\$242.0	\$242.0
Long-Term Debt	\$2,484.8	\$2,478.3	\$2,423.7	\$2,517.6
	<u>\$5,150.4</u>	<u>\$5,036.7</u>	<u>\$4,946.0</u>	<u>\$5,104.4</u>
<u>Capital Components</u>	<u>March 31, 2021</u>	<u>June 30, 2021</u>	<u>September 30, 2021</u>	<u>December 31, 2021</u>
Common Equity	\$2,489.3	\$2,455.1	\$2,416.2	\$2,427.8
Preferred Stock	\$242.0	\$242.0	\$242.0	\$242.0
Long-Term Debt	\$2,692.5	\$2,939.0	\$2,939.1	\$3,206.8
	<u>\$5,423.8</u>	<u>\$5,636.1</u>	<u>\$5,597.3</u>	<u>\$5,876.6</u>
<u>Capital Components</u>	<u>March 31, 2022</u>	<u>June 30, 2022</u>	<u>September 30, 2022</u>	<u>December 31, 2022</u>
Common Equity	\$2,599.2	\$2,603.9		
Preferred Stock	\$242.0	\$242.0		
Long-Term Debt	\$3,207.3	\$3,207.9		
	<u>\$6,048.5</u>	<u>\$6,053.8</u>		

**Historical Consolidated Capital Structures for
Spire Missouri**

(Dollars in Millions)

<u>Capital Components</u>	<u>March 31, 2019</u>	<u>June 30, 2019</u>	<u>September 30, 2019</u>	<u>December 31, 2019</u>
Common Equity	\$1,374.0	\$1,376.3	\$1,339.3	\$1,376.1
Preferred Stock	\$0.0	\$0.0	\$0.0	\$0.0
Long-Term Debt	\$924.7	\$924.8	\$925.0	\$1,098.6
Total	<u>\$2,298.7</u>	<u>\$2,301.1</u>	<u>\$2,264.3</u>	<u>\$2,474.7</u>
<u>Capital Components</u>	<u>March 31, 2020</u>	<u>June 30, 2020</u>	<u>September 30, 2020</u>	<u>December 31, 2020</u>
Common Equity	\$1,439.1	\$1,434.40	\$1,435.1	\$1,491.8
Preferred Stock	\$0.0	\$0.00	\$0.0	\$0.0
Long-Term Debt	\$1,098.7	\$1,091.90	\$1,092.0	\$1,092.2
Total	<u>\$2,537.8</u>	<u>\$2,526.3</u>	<u>\$2,527.1</u>	<u>\$2,584.0</u>
<u>Capital Components</u>	<u>March 31, 2021</u>	<u>June 30, 2021</u>	<u>September 30, 2021</u>	<u>December 31, 2021</u>
Common Equity	\$1,585.0	\$1,588.2	\$1,577.9	\$1,623.3
Preferred Stock	\$0.0	\$0.00	\$0.0	\$0.0
Long-Term Debt	\$1,092.4	\$1,338.6	\$1,338.4	\$1,637.0
	<u>\$2,677.4</u>	<u>\$2,926.8</u>	<u>\$2,916.3</u>	<u>\$3,260.3</u>
<u>Capital Components</u>	<u>March 31, 2022</u>	<u>June 30, 2022</u>	<u>September 30, 2022</u>	<u>December 31, 2022</u>
Common Equity	\$1,744.9	\$1,764.5		
Preferred Stock	\$0.0	\$0.0		
Long-Term Debt	\$1,637.1	\$1,637.4		
	<u>\$3,382.0</u>	<u>\$3,401.9</u>		

Sources:
SEC Form 10-Q and 10-K

Spire Missouri
Case No. GR-2022-0179

**Historical Consolidated Capital Structures for
Spire Inc.**
(Percentage)

Capital Components	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019
Common Equity	51.30%	50.93%	49.74%	46.23%
Preferred Stock	5.16%	5.20%	5.23%	4.77%
Long-Term Debt	43.54%	43.87%	45.02%	49.00%
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>
Capital Components	March 31, 2020	June 30, 2020	September 30, 2020	December 31, 2020
Common Equity	47.06%	45.99%	46.10%	45.94%
Preferred Stock	4.70%	4.80%	4.89%	4.74%
Long-Term Debt	48.24%	49.20%	49.00%	49.32%
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>
Capital Components	March 31, 2021	June 30, 2021	September 30, 2021	December 31, 2021
Common Equity	45.90%	43.56%	43.17%	41.31%
Preferred Stock	4.46%	4.29%	4.32%	4.12%
Long-Term Debt	49.64%	52.15%	52.51%	54.57%
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>
Capital Components	March 31, 2022	June 30, 2022	September 30, 2022	December 31, 2022
Common Equity	42.97%	43.01%		
Preferred Stock	4.00%	4.00%		
Long-Term Debt	53.03%	52.99%		
	<u>100.00%</u>	<u>100.00%</u>		

**Historical Consolidated Capital Structures for
Spire Missouri**
(Percentage)

Capital Components	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019
Common Equity	59.77%	59.81%	59.15%	55.61%
Preferred Stock	0.00%	0.00%	0.00%	0.00%
Long-Term Debt	40.23%	40.19%	40.85%	44.39%
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>
Capital Components	March 31, 2020	June 30, 2020	September 30, 2020	December 31, 2020
Common Equity	56.71%	56.78%	56.79%	57.73%
Preferred Stock	0.00%	0.00%	0.00%	0.00%
Long-Term Debt	43.29%	43.22%	43.21%	42.27%
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>
Capital Components	March 31, 2021	June 30, 2021	September 30, 2021	December 31, 2021
Common Equity	59.20%	54.26%	54.11%	49.79%
Preferred Stock	0.00%	0.00%	0.00%	0.00%
Long-Term Debt	40.80%	45.74%	45.89%	50.21%
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>
Capital Components	March 31, 2022	June 30, 2022	September 30, 2022	December 31, 2022
Common Equity	51.59%	51.87%		
Preferred Stock	0.00%	0.00%		
Long-Term Debt	48.41%	48.13%		
	<u>100.00%</u>	<u>100.00%</u>		

Sources:
SEC Form 10-Q and 10-K

Spire Missouri
Case No. GR-2022-0179

Capital Structure as of June 30, 2022

Spire Inc.

(Dollars in Millions)

<u>Capital Component</u>	<u>Amount</u>	<u>Percentage of Capital</u>
Common Stock Equity	\$2,604	43.01%
Preferred Stock	\$242	4.00%
Long-Term Debt	\$3,208	52.99%
Total Capitalization	<u><u>\$6,054</u></u>	<u><u>100.00%</u></u>

Capital Structure as of June 30, 2022

Spire Missouri

(Dollars in Millions)

<u>Capital Component</u>	<u>Amount</u>	<u>Percentage of Capital</u>
Common Stock Equity	\$1,765	51.87%
Preferred Stock	\$0	0.00%
Long-Term Debt	\$1,637	48.13%
Total Capitalization	<u><u>\$3,402</u></u>	<u><u>100.00%</u></u>

Source:

SEC Form 10-Q and 10-K

Spire Missouri
Case No. GR-2022-0179

Embedded Cost of Long-Term Debt as of June 30, 2021

Spire Inc.
(In millions)

Total Annual Cost:	\$27.4
Total Carrying Value:	\$827.9
Embedded Cost = Total Annual Cost/Total Carrying Value	3.31%

Spire Missouri
(In millions)

Total Annual Cost:	\$53.2
Total Carrying Value:	\$1,328.6
Embedded Cost = Total Annual Cost/Total Carrying Value	4.005%

Spire Missouri
Case No. GR-2022-0179

Embedded Cost of Preferred Stock as of May 14, 2022

Spire Inc.
(In millions)

Total Annual Cost:	\$14.8
Total Carrying Value:	\$242.3
Embedded Cost = Total Annual Cost/Total Carrying Value	6.09%

Spire Missouri
(In millions)

Total Annual Cost:	N/A
Total Carrying Value:	N/A
Embedded Cost = Total Annual Cost/Total Carrying Value	N/A

Note:
Source:
Staff Dtata Request No. 0204

**Spire Missouri
Case No. GR-2022-0179**

PROXY GROUP SCREENING DATA AND RESULTS

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]		
Gas Utility Companies	Ticker	Stock Publicly Traded	Information Provided by Value Line	Information Provided by Reuters	5-Year Data Available	Dividends	At Least Investment Grade Credit Rating	S&P Global Rating	Moody's	At least 65% of Regulated Income from Gas Utility Operations	At least 65% of Assets are Gas Distribution Operations	No Reduced Dividend Since 2015	Positive Growth Rates from at Least Two Sources	Covered by More Than 2 Analyst	Comparable Company Met All Criteria
Atmos Energy Corporation	ATO	Yes	Yes	Yes	Yes	Yes	Yes	A-	A1	Yes	Yes	Yes	Yes	Yes	Yes
Chesapeake Util.	CPK	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	No	No	Yes	Yes	Yes	No
New Jersey Resources Corporation	NJR	Yes	Yes	Yes	Yes	Yes	Yes	N/A	A1	Yes	Yes	Yes	Yes	Yes	Yes
NiSource Inc.	NI	Yes	Yes	Yes	Yes	Yes	Yes	BBB+	Baa2	No	No	No	Yes	Yes	No
Northwest Natural Holding Company	NWN	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Baa1	Yes	Yes	Yes	Yes	Yes	Yes
ONE Gas, Inc.	OGS	Yes	Yes	Yes	Yes	Yes	Yes	BBB+	A3	Yes	Yes	Yes	Yes	Yes	Yes
South Jersey Industries, Inc.	SJI	Yes	Yes	Yes	Yes	Yes	Yes	BBB	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Southwest Gas Holdings, Inc.	SWX	Yes	Yes	Yes	Yes	Yes	Yes	BBB+	Baa2	Yes	Yes	Yes	Yes	Yes	Yes
Spire Inc.	SR	Yes	Yes	Yes	Yes	Yes	Yes	A-	Baa2	Yes	Yes	Yes	Yes	Yes	Yes

Note:

- [1] Source: The Value Line Investment Survey: Ratings & Reports
- [2] Source: The Value Line Investment Survey: Ratings & Reports
- [3] Source: Reuters, <https://www.reuters.com/>
- [4] Source: The Value Line Investment Survey: Ratings & Reports
- [5] Source: The Value Line Investment Survey: Ratings & Reports
- [6] Source: S&P Global Market Intelligence
- [7] Source: S&P Global Market Intelligence
- [8] Source: S&P Global Market Intelligence
- [9] Source: SEC Form 10-K Filings
- [10] Source: SEC Form 10-K Filings
- [11] Source: The Value Line Investment Survey: Ratings & Reports
- [12] Source: S&P Global Market Intelligence, Value Line Investment Survey, Yahoo! Finance, and Zacks
- [13] Source: S&P Global Market Intelligence, Value Line Investment Survey, Yahoo! Finance, and Zacks

Spire Missouri
Case No. GR-2022-0179

PROXY GROUP LIST

Gas Utility Companies	Ticker
1 Atmos Energy Corporation	ATO
2 New Jersey Resources Corporation	NJR
3 Northwest Natural Holding Company	NWN
4 ONE Gas, Inc.	OGS
5 South Jersey Industries, Inc.	SJI
6 Southwest Gas Holdings, Inc.	SWX
7 Spire Inc.	SR

Spire Missouri
Case No. GR-2022-0179

Growth Rate Estimates
Based on Dividend per Share (DPS) and Earning per Share (EPS)
for the Comparable Natural Gas Utility Companies

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
2022 Q2		Past 10-Years			Past 5-Year			Projected			Average			Projective	Projective
Water Utility Companies	Ticker	EPS	DPS	BVPS	EPS	DPS	BVPS	EPS	DPS	BVPS	EPS	DPS	BVPS	Growth	Normal GDP
1 Atmos Energy Corporation	ATO	8.50%	5.50%	8.50%	8.50%	8.00%	11.00%	7.50%	7.00%	7.50%	8.17%	6.83%	9.00%	7.33%	3.90%
2 New Jersey Resources Corporation	NJR	5.00%	6.50%	7.50%	2.50%	6.50%	7.00%	5.00%	5.00%	4.50%	4.17%	6.00%	6.33%	4.83%	3.90%
3 Northwest Natural Holding Company	NWN	-1.00%	1.50%	1.00%	2.50%	0.50%	0.05%	6.50%	0.50%	4.00%	2.67%	0.83%	1.68%	3.67%	3.90%
4 ONE Gas, Inc.	OGS				9.50%	13.50%	3.50%	6.50%	6.50%	9.50%	8.00%	10.00%	6.50%	7.50%	3.90%
5 South Jersey Industries, Inc.	SJI	1.00%	6.00%	5.50%	0.50%	3.50%	2.00%	10.50%	4.00%	5.00%	4.00%	4.50%	4.17%	6.50%	3.90%
6 Southwest Gas Holdings, Inc.	SWX	5.50%	8.50%	6.50%	4.50%	7.00%	7.00%	10.00%	5.50%	7.50%	6.67%	7.00%	7.00%	7.67%	3.90%
7 Spire Inc.	SR	2.00%	4.50%	6.50%	2.50%	6.00%	4.50%	9.00%	5.00%	7.00%	4.50%	5.17%	6.00%	7.00%	3.90%
Average		3.50%	5.42%	5.92%	4.36%	6.43%	5.01%	7.86%	4.79%	6.43%	5.45%	5.76%	5.81%	6.36%	3.90%

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
2021 Q1		Past 10-Years			Past 5-Year			Projected			Average			Projective	Projective
Water Utility Companies	Ticker	EPS	DPS	BVPS	EPS	DPS	BVPS	EPS	DPS	BVPS	EPS	DPS	BVPS	Growth	Normal GDP
1 Atmos Energy Corporation	ATO	8.00%	5.00%	7.50%	9.00%	7.50%	10.00%	7.00%	7.50%	10.50%	8.00%	6.67%	9.33%	8.33%	3.80%
2 New Jersey Resources Corporation	NJR	7.00%	7.00%	7.00%	6.00%	6.50%	8.50%	1.50%	5.50%	5.00%	4.83%	6.33%	6.83%	4.00%	3.80%
3 Northwest Natural Holding Company	NWN	-11.00%	2.00%	1.50%	-17.00%	0.50%	-0.50%	5.50%	0.50%	8.00%	-7.50%	1.00%	3.00%	4.67%	3.80%
4 ONE Gas, Inc.	OGS				9.50%	17.00%	2.50%	6.50%	7.00%	4.50%	8.00%	12.00%	3.50%	6.00%	3.80%
5 South Jersey Industries, Inc.	SJI	1.00%	7.50%	5.50%	-4.00%	5.00%	3.50%	10.50%	4.00%	5.00%	2.50%	5.50%	4.67%	6.50%	3.80%
6 Southwest Gas Holdings, Inc.	SWX	8.00%	8.50%	6.00%	4.50%	9.50%	6.50%	8.00%	4.50%	6.00%	6.83%	7.50%	6.17%	6.17%	3.80%
7 Spire Inc.	SR	1.50%	4.50%	7.00%	4.50%	6.00%	5.50%	9.00%	4.50%	8.50%	5.00%	5.00%	7.00%	7.33%	3.80%
Average		2.42%	5.75%	5.75%	1.79%	7.43%	5.14%	6.86%	4.79%	6.79%	3.95%	6.29%	5.79%	6.14%	3.80%

Note:

- [1] Source: The Value Line Investment Survey
- [2] Source: The Value Line Investment Survey
- [3] Source: The Value Line Investment Survey
- [4] Source: The Value Line Investment Survey
- [5] Source: The Value Line Investment Survey
- [6] Source: The Value Line Investment Survey
- [7] Source: The Value Line Investment Survey
- [8] Source: The Value Line Investment Survey
- [9] Source: The Value Line Investment Survey
- [10] $=([1]+[4]+[7])/3$
- [11] $=([2]+[5]+[8])/3$
- [12] $=([3]+[6]+[9])/3$
- [13] $=([7]+[8]+[9])/3$
- [14] Source: Congress Budget Office (CBO), Budget Economic Outlook

Spire Missouri
Case No. GR-2022-0179

Average High / Low Stock Price
for the Comparable Natural Gas Utility Companies

		[1]	[2]	[3]	[4]	[5]	[6]	[7]
2022 Q2		<u>April 2022</u>		<u>May 2022</u>		<u>June 2022</u>		Average
		High	Low	High	Low	High	Low	High/Low
		Stock	Stock	Stock	Stock	Stock	Stock	Stock Price
<u>Company Name</u>	<u>Ticker</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>(4/01/22 - 6/30/22)</u>
1 Atmos Energy Corporation	ATO	120.72	118.45	115.01	112.65	111.76	109.44	114.67
2 New Jersey Resources Corporation	NJR	46.33	45.24	45.18	44.08	45.01	43.88	44.95
3 Northwest Natural Holding Company	NWN	51.25	50.21	51.57	50.32	53.75	52.48	51.60
4 ONE Gas, Inc.	OGS	90.16	88.12	86.98	84.85	83.21	81.27	85.76
5 South Jersey Industries, Inc.	SJI	34.61	34.35	34.27	33.84	34.38	33.97	34.24
6 Southwest Gas Holdings, Inc.	SWX	85.44	83.03	92.31	89.83	89.99	87.71	88.05
7 Spire Inc.	SR	76.11	74.34	76.35	74.43	75.59	73.93	75.13
2021 Q1		<u>January 2021</u>		<u>February 2021</u>		<u>March 2021</u>		Average
		High	Low	High	Low	High	Low	High/Low
		Stock	Stock	Stock	Stock	Stock	Stock	Stock Price
<u>Company Name</u>	<u>Ticker</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>Price</u>	<u>(1/01/21 - 3/31/21)</u>
1 Atmos Energy Corporation	ATO	91.28	89.09	90.93	88.97	93.60	91.55	90.90
2 New Jersey Resources Corporation	NJR	36.33	35.18	38.14	37.21	41.06	39.79	37.95
3 Northwest Natural Holding Company	NWN	45.13	43.40	47.62	46.24	52.61	50.69	47.61
4 ONE Gas, Inc.	OGS	73.88	71.86	73.13	71.25	74.74	72.65	72.92
5 South Jersey Industries, Inc.	SJI	22.37	21.51	24.13	23.44	25.54	24.43	23.57
6 Southwest Gas Holdings, Inc.	SWX	60.26	58.67	63.54	61.83	68.05	65.89	63.04
7 Spire Inc.	SR	62.54	60.83	65.95	64.27	73.00	70.99	66.26

Note:

[1] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[2] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[3] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[4] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[5] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[6] Source: Wall Street Journal, <https://www.wsj.com/market-data>

[7] = (([1]+[2]+[3]+[4]+[5]+[6]) / 6)

Spire Missouri
Case No. GR-2022-0179

Discounted Cash Flow (DCF) Costs of Common Equity (COE) Estimates
Based on Dividend per Share, Earning per Share, Stock Price, and Growth Rate
for the Comparable Natural Gas Utility Companies

<u>2022 Q2 DCF COE estimate</u>										
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
Gas Utility Companies	Ticker	Dividend per Share	Stock Price	Dividend Yield	Expected Dividend Yield	Projected Growth	Projected GDP Growth	Growth Rate	COE	
1	Atmos Energy Corporation	ATO	2.50	114.67	2.18%	2.25%	7.33%	3.90%	6.65%	8.90%
2	New Jersey Resources Corporation	NJR	1.36	44.95	3.03%	3.10%	4.83%	3.90%	4.65%	7.74%
3	Northwest Natural Holding Company	NWN	1.92	51.60	3.72%	3.79%	3.67%	3.90%	3.71%	7.50%
4	ONE Gas, Inc.	OGS	2.32	85.76	2.71%	2.80%	7.50%	3.90%	6.78%	9.58%
5	South Jersey Industries, Inc.	SJI	1.22	34.24	3.56%	3.67%	6.50%	3.90%	5.98%	9.65%
6	Southwest Gas Holdings, Inc.	SWX	2.38	88.05	2.70%	2.80%	7.67%	3.90%	6.91%	9.71%
7	Spire Inc.	SR	2.60	75.13	3.46%	3.57%	7.00%	3.90%	6.38%	9.95%
Average			2.04	70.63	3.05%	3.14%	6.36%	3.90%	5.87%	9.00%
									DCF Lower Bound	8.74%
									DCF Upper Bound	9.65%
									DCF COE	9.00%

<u>2021 Q1 DCF COE estimate</u>										
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
Gas Utility Companies	Ticker	Dividend per Share	Stock Price	Dividend Yield	Expected Dividend Yield	Projected Growth	Projected GDP Growth	Growth Rate	COE	
1	Atmos Energy Corporation	ATO	2.30	90.90	2.53%	2.62%	8.33%	3.80%	7.43%	10.05%
2	New Jersey Resources Corporation	NJR	1.27	37.95	3.35%	3.41%	4.00%	3.80%	3.96%	7.37%
3	Northwest Natural Holding Company	NWN	1.91	47.61	4.01%	4.10%	4.67%	3.80%	4.49%	8.59%
4	ONE Gas, Inc.	OGS	2.16	72.92	2.96%	3.04%	6.00%	3.80%	5.56%	8.60%
5	South Jersey Industries, Inc.	SJI	1.19	23.57	5.05%	5.20%	6.50%	3.80%	5.96%	11.16%
6	Southwest Gas Holdings, Inc.	SWX	2.28	63.04	3.62%	3.72%	6.17%	3.80%	5.69%	9.41%
7	Spire Inc.	SR	2.49	66.26	3.76%	3.88%	7.33%	3.80%	6.63%	10.51%
Average			1.94	57.47	3.61%	3.71%	6.14%	3.80%	5.67%	9.38%
									DCF Lower Bound	8.87%
									DCF Upper Bound	9.99%
									DCF COE	9.38%

Comparison DCF Estimates

2021 Q1 DCF COE estimate	9.38%
2022 Q2 DCF COE estimate	9.00%
Difference of Averages between Q1 2021 and Q4 2021	<u>-0.38%</u>

Note:

- [1] Source: The Value Line Investment Survey: Ratings & Reports.
- [2] Source: The Wall Street Journal; Average Monthly Highest and Lowest.
- [3] = [1] / [2]
- [4] = [3] x (1 + .5 x [7])
- [5] Source: [12] of Growth Rate SJW-11
- [6] Source: Congress Budget Office (CBO), Budget Economic Outlook
- [7] = (4 x [5] + [6]) / 5
- [8] = [4] + [7]

Spire Missouri
Case No. GR-2022-0179

Capital Asset Pricing Model (CAPM) Costs of Common Equity (COE) Estimates
Based on Historical Return Differences Between Common Stocks and Long-Term U.S. Treasuries
for the Comparable Natural Gas Utility Companies

<u>2022 Q2 CAPM Estimate</u>	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]						
			Duff&Phelps (1926-2021)				NYU Stern (1928-2021)				Market Risk Premium				CAPM Cost of Common Equity									
			Large Company Stocks		Long-term G-Bonds		S&P 500		US Treasury Bond		Duff&Phelps		NYU Stern		Duff&Phelps		NYU Stern							
Gas Utility Companies	Risk-Free Rate	Beta	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return						
1 Atmos Energy Corporation	3.04%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.73%	7.87%	7.15%	8.41%						
2 New Jersey Resources Corporation	3.04%	0.95	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.42%	8.77%	7.92%	9.42%						
3 Northwest Natural Holding Company	3.04%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.73%	7.87%	7.15%	8.41%						
4 ONE Gas, Inc.	3.04%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.73%	7.87%	7.15%	8.41%						
5 South Jersey Industries, Inc.	3.04%	1.00	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.65%	9.07%	8.18%	9.75%						
6 Southwest Gas Holdings, Inc.	3.04%	0.90	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.19%	8.47%	7.66%	9.08%						
7 Spire Inc.	3.04%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.73%	7.87%	7.15%	8.41%						
Average	3.04%	0.86	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.03%	8.25%	7.48%	8.84%						
																		CAPM Lower Bound	7.15%					
																			CAPM Upper Bound	7.87%				
																			Average	7.51%				
<u>2021 Q1 CAPM Estimate</u>	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]						
			Duff&Phelps (1926-2020)				NYU Stern (1928-2020)				Market Risk Premium				CAPM Cost of Common Equity									
			Large Company Stocks		Long-term G-Bonds		S&P 500		US Treasury Bond		Duff&Phelps		NYU Stern		Duff&Phelps		NYU Stern							
Gas Utility Companies	Risk-Free Rate	Beta	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return						
Atmos Energy Corporation	2.07%	0.80	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.77%	6.93%	5.94%	7.21%						
New Jersey Resources Corporation	2.07%	0.95	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.47%	7.84%	6.67%	8.17%						
Northwest Natural Holding Company	2.07%	0.80	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.77%	6.93%	5.94%	7.21%						
ONE Gas, Inc.	2.07%	0.80	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.77%	6.93%	5.94%	7.21%						
South Jersey Industries, Inc.	2.07%	1.05	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.93%	8.44%	7.15%	8.82%						
Southwest Gas Holdings, Inc.	2.07%	0.95	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.47%	7.84%	6.67%	8.17%						
Spire Inc.	2.07%	0.85	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.00%	7.23%	6.18%	7.53%						
Average	2.07%	0.89	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.17%	7.45%	6.36%	7.76%						
																			CAPM Lower Bound	6.18%				
																				CAPM Upper Bound	7.23%			
																				Average	6.71%			
<u>Comparison DCF Estimates</u>																								
																					Average MRP	5.62%		
																						2021 Q1 CAPM COE estimate	6.71%	
																							2022 Q2 CAPM COE estimate	7.51%
																							Difference of Averages between 2021 Q1 and 2022 Q2	0.80%

Note:
 [1] Source: 3-Month Average of 30-Year Treasury Bond
 [2] Source: Value Line, Investment Survey.
 [3] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
 [4] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
 [5] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
 [6] Source: Duff & Phelps, the Stocks, Bonds, Bills, and Inflation (S&BBI®) Monthly Dataset.
 [7] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
 [8] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
 [9] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
 [10] Source: Risk Premium, Damodaran Online, Stern School of Business, NYU.
 [11] = [3] - [5]
 [12] = [4] - [6]
 [13] = [7] - [9]
 [14] = [8] - [10]

**Spire Missouri
Case No. GR-2022-0179**

AUTHORIZED RETURN ON EQUITY

		<u>COE</u>	
2022 Q2 Estimate	DCF	9.00%	A
	CAPM	7.51%	B
Average		8.25%	C
2021 Q1 Estimate	DCF	9.38%	D
	CAPM	6.71%	E
Average		8.04%	F
ROE Adjustment		0.21%	G
Last Authorized ROE	2021 Q1	9.37%	H
Estimated ROE	2022 Q2	9.58%	I

Note:

A Schedule SJW-13

B Schedule SJW-14

C = $([A] + [B]) / 2$

D Schedule SJW-13

E Schedule SJW-14

F = $([D] + [E]) / 2$

G = $[C] - [F]$

H Spire Missouri rate Case No. GR-2021-0108

I = $[G] + [H]$

**Spire Missouri
Case No. GR-2022-0179**

ALLOWED RATE OF RETURN

Capital Component	[1] Percentage of Capital	Embedded Cost	Allowed Rate of Return Common Equity Return of:		
			Lower 9.33%	ROE 9.58% ^[4]	Upper 9.83%
Common Stock Equity	51.87%	-	4.84%	4.97%	5.10%
Preferred Stock	0.00%	0.00% ^[2]	0.00%	0.00%	0.00%
Long-Term Debt	48.13%	4.005% ^[3]	1.93%	1.93%	1.93%
Total	<u><u>100.00%</u></u>		<u><u>6.77%</u></u>	<u><u>6.90%</u></u>	<u><u>7.03%</u></u>

Note:
Staff's COS Report
[1] Schedule SJW-d6
[2] Schedule SJW-d8
[3] Schedule SJW-d7
[4] Schedule SJW-d15

Spire Missouri
Case No. GR-2022-0179

Authorized ROE of the U.S Utility by Sector
2010-2022

<u>Year</u>	<u>Natural Gas</u>		<u>Natural Gas</u>		<u>Natural Gas Total</u>		<u>Electric</u>		<u>Electric</u>		<u>Electric Total</u>	
	<u>Fully Litigated</u>	<u>Settled</u>	<u>Fully Litigated</u>	<u>Settled</u>	<u>Fully Litigated</u>	<u>Settled</u>	<u>Fully Litigated</u>	<u>Settled</u>	<u>Fully Litigated</u>	<u>Settled</u>	<u>Fully Litigated</u>	<u>Settled</u>
	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>	<u>ROE (%)</u>	<u>Case (No.)</u>
2010	10.08	27	10.30	12	10.15	39	10.35	27	10.39	34	10.37	61
2011	9.76	8	10.08	8	9.92	16	10.39	26	10.12	16	10.29	42
2012	9.92	21	9.99	14	9.94	35	10.28	29	10.06	29	10.17	58
2013	9.59	12	9.80	9	9.68	21	9.85	17	10.12	32	10.03	49
2014	9.98	15	9.51	11	9.78	26	10.05	21	9.73	17	9.91	38
2015	9.58	5	9.60	11	9.60	16	9.66	16	10.04	15	9.84	31
2016	9.61	10	9.50	16	9.54	26	9.74	25	9.80	17	9.77	42
2017	9.82	7	9.68	17	9.72	24	9.73	24	9.75	29	9.74	53
2018	9.59	17	9.59	23	9.59	40	9.63	22	9.57	26	9.60	48
2019	9.74	12	9.70	20	9.71	32	9.58	27	9.76	20	9.66	47
2020	9.44	12	9.48	23	9.47	35	9.43	32	9.46	23	9.44	55
2021	9.63	13	9.53	30	9.56	43	9.22	30	9.57	25	9.38	55
2022	9.23	1	9.34	8	9.33	9	9.43	12	9.32	7	9.39	19