COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:	)	
ELECTRONIC APPLICATION OF LOUISVILLE GAS AND ELECTRIC COMPANY FOR AN ADJUSTMENT OF ITS ELECTRIC AND GAS RATES AND FOR CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY	)	**CASE NO. 2016-00371**

Direct Testimony and Exhibits of

Christopher C. Walters

On behalf of

United States Department of Defense
and all other Federal Executive Agencies

March 3, 2017

BRUBAKER & ASSOCIATES, INC.

Project 10359

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STATE OF MISSOURI)
) **SS**
COUNTY OF ST. LOUIS)

VERIFICATION OF CHRISTOPHER C. WALTERS

Christopher C. Walters, being first duly sworn, states the following: The prepared Direct Testimony constitutes the direct testimony of Affiant in the above-styled case. Affiant states that he would give the answers set forth in the Direct Testimony if asked the questions propounded therein. Affiant further states that, to the best of his knowledge, his statements made are true and correct. Further affiant saith not.

Christopher C. Walters

Subscribed and sworn to before me this 2nd day of March, 2017.

MARIA E. DECKER
Notary Public - Notary Seal
STATE OF MISSOURI
St. Louis City
My Commission Expires: May 5, 2017
Commission # 13706793

Notary Public

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Direct Testimony of Christopher C. Walters

I. INTRODUCTION

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Christopher C. Walters. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q WHAT IS YOUR OCCUPATION?

A I am a Consultant in the field of public utility regulation with the firm of Brubaker & Associates, Inc., energy, economic and regulatory consultants.

Q PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A This information is included in Appendix A to my testimony.

Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A I am appearing in this proceeding on behalf of the United States Department of Defense and all other Federal Executive Agencies ("DoD/FEA").

Q WHAT IS THE SUBJECT MATTER OF YOUR TESTIMONY?

A My testimony will address the current market cost of equity, and resulting overall rate of return, for Louisville Gas and Electric Company ("LG&E" or the "Company"). In my analyses, I consider the results of several market models, the current economic environment and outlook for the regulated utility industry, as well as the financial integrity of LG&E given my recommended return on equity. I will also respond to LG&E witness Mr. Adrien McKenzie's recommended return on equity range of 9.63% to 10.83%, with a midpoint of 10.23%.

My silence in regard to any issue should not be construed as an endorsement of LG&E's position.

Q PLEASE SUMMARIZE YOUR RECOMMENDATIONS AND CONCLUSIONS ON RATE OF RETURN.

A I recommend the Kentucky Public Service Commission (the "Commission") award a return on common equity of 9.35%, which is at the midpoint of my recommended range of 9.00% to 9.70%. My recommended return on equity will fairly compensate LG&E for its current market cost of common equity, will support its financial integrity and access to capital, and it will mitigate the claimed revenue deficiency in this proceeding by fairly balancing the interests of investors and ratepayers.

LG&E's proposed ratemaking capital structure contains an unreasonably high balance of common equity to total capital than necessary to balance its financial risk with a capital structure that results in just and reasonable rates. By using a ratemaking capital structure with an inflated amount of common equity as LG&E is proposing, its cost of service is inflated above the amount that is necessary to maintain its financial integrity, credit rating, and access to capital under reasonable terms and conditions. For this reason, I urge the Commission to carefully consider LG&E's capital structure when making a determination on a fair return on equity for LG&E.

Based on my recommended return on equity and the Company's embedded cost of debt and capital structure produces an overall rate of return of 6.77% as shown on my Exhibit CCW-1.

Finally, I will show that the 10.23% return on equity proposed by LG&E witness Mr. McKenzie is excessive and unreasonable. Mr. McKenzie's recommended return on equity is far above a reasonable estimate of LG&E's market cost of equity and should be rejected.

II. RATE OF RETURN

Q PLEASE DESCRIBE THIS SECTION OF YOUR TESTIMONY.

A In this section of my testimony, I will explain the analysis I performed to determine the reasonable rate of return in this proceeding and present the results of my analysis. I begin my estimate of a fair return on equity by reviewing the authorized returns approved by the regulatory commissions in various jurisdictions, the market assessment of the regulated utility industry investment risk, credit standing, and stock

price performance. I used this information to get a sense of the market's perception of the investment risk characteristics of the regulated utility industry in general, which is then used to produce a refined estimate of the market's return requirement for assuming investment risk similar to LG&E's regulated utility operations.

As described below, I find the credit rating outlook of the industry to be stable, supportive of the industry's financial integrity, and favorable for access to an abundance of low cost capital. Further, regulated utilities' stocks have exhibited strong and stable price valuations over the last several years, which is evidence of utility access to capital, and solid investment characteristics.

Based on this review of credit outlooks and stock price performance, I conclude that the market continues to embrace the regulated utility industry as a safe-haven investment option and views utility equity and debt investments as a low-risk investment alternative.

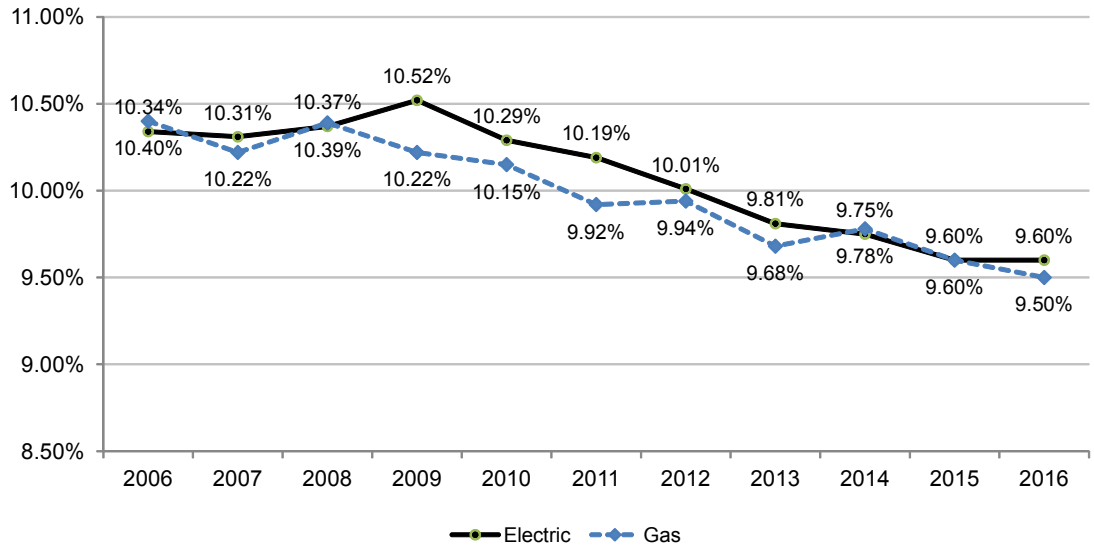
II.A. Electric Industry Authorized Returns on Equity, Access to Capital, and Credit Strength

Q PLEASE DESCRIBE THE OBSERVABLE EVIDENCE ON TRENDS IN AUTHORIZED RETURNS ON EQUITY FOR ELECTRIC AND GAS UTILITIES, UTILITIES' CREDIT STANDING, AND UTILITIES' ACCESS TO CAPITAL TO FUND INFRASTRUCTURE INVESTMENT.

A Authorized returns on equity for both electric and gas utilities have been steadily declining over the last 10 years, as illustrated in Figure 1 below. More recent authorized returns on equity for electric utilities have declined down to about 9.60%, and local gas delivery utilities' returns on equity have declined to 9.50%. Further,

authorized returns for gas delivery utilities have consistently trended at or below the returns authorized for electric utilities.

Figure 1



Source and Note:
Regulatory Research Associates, Inc., Regulatory Focus, Major Rate Case Decisions -- January - December 2016, January 18, 2016 at pages 5 and 6.

While the declines in authorized returns on equity are public knowledge, and align with declining capital market costs, utilities are maintaining stable investment grade credit standing, and have been able to attract large amounts of capital at low costs to fund very large capital programs.

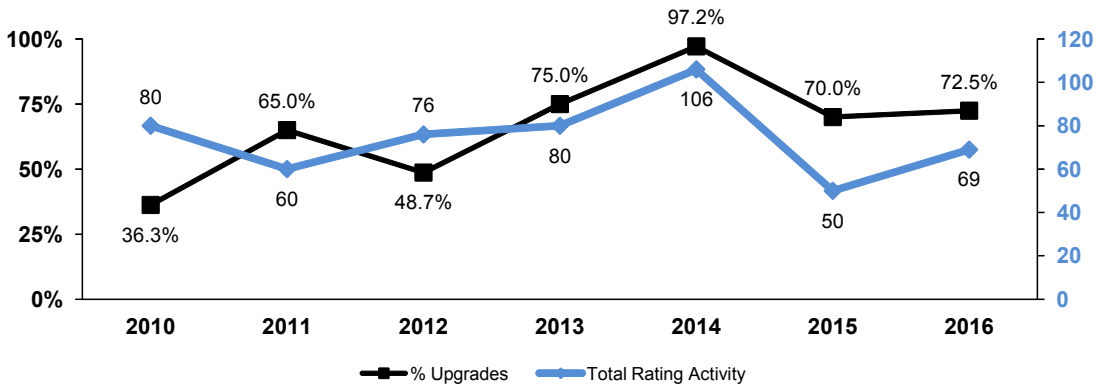
Q PLEASE DESCRIBE THE TREND IN CREDIT RATING CHANGES IN THE ELECTRIC UTILITY INDUSTRY OVER THE LAST FIVE YEARS.

A As shown below in Figure 2, over the period 2010 through 2016, the electric utility industry has experienced a significant number of upgrades in credit ratings by all of the major credit rating agencies (Fitch Ratings, Moody's, and Standard & Poor's).

Figure 2

Credit Rating Changes
(U.S. Shareholder-Owned Electric Utility Industry)

	2010	2011	2012	2013	2014	2015	2016
Upgrades	29	39	37	60	103	35	50
Downgrades	51	21	39	20	3	15	19
% Upgrades	36.3%	65.0%	48.7%	75.0%	97.2%	70.0%	72.5%
Total Rating Activity	**80**	**60**	**76**	**80**	**106**	**50**	**69**



Source: EEI 2016 Q4 Credit Ratings. Tab IV. Direction of Rating Action.

As noted above in Figure 2, the upgrades in utility credit ratings started outpacing downgrades in 2011, and more recently, the number of upgrades has substantially exceeded the number of downgrades. For example, in 2014, there were 103 upgrades and only three downgrades. In 2015, the number of upgrades was more than twice the number of downgrades (35 upgrades and 15 downgrades). This trend was even more profound in 2016.

Q HOW DID THIS CREDIT RATING ACTIVITY IMPACT THE CREDIT RATING OF THE ELECTRIC AND GAS UTILITY INDUSTRY?

A The credit rating changes for the electric utility industry reflect a significant strengthening of the industry credit outlook. As shown in Table 1 below, in 2008, approximately 69% of the electric utility industry was rated from BBB- to BBB+, 18% had a bond rating better than BBB+, and around 13% of the industry was below investment grade. This industry rating improved steadily over the subsequent six years. By year-end 2016, only 3% of the industry was below investment grade, around 65% continued to be in the range of BBB- to BBB+, and over 32% of the industry had a bond rating above BBB+. Overall, the improvement to the credit rating of the electric utility industry has been very significant.

Table 1

S&P Ratings by Category
(Year End)

Description	2008	2009	2010	2011	2012	2013	2014	2015	2016
Regulated									
A or higher	8%	7%	9%	8%	6%	3%	3%	3%	5%
A-	10%	15%	14%	14%	17%	20%	21%	22%	27%
BBB+	23%	22%	17%	19%	14%	17%	32%	33%	35%
BBB	23%	27%	31%	35%	36%	49%	37%	33%	22%
BBB-	23%	20%	17%	14%	17%	6%	3%	3%	8%
Below BBB-	13%	10%	11%	11%	11%	6%	5%	6%	3%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: EEI 2016 Q4 Credit Ratings. Tab V. S&P Rating by Comp. Category.

Table 2 below shows the changes in credit ratings in the gas utility industry. Similar to the electric utilities in 2009, 51% of the industry had a credit rating in the BBB category. By the end of 2016, the credit rating for gas utilities improved and the majority (63%) of the companies were rated above BBB+.

Table 2

S&P Ratings by Category
(Year End)

Description	2009	2010	2011	2012	2013	2014	2015	2016
Regulated Gas								
A or higher	50%	50%	50%	50%	38%	38%	38%	50%
A-	0%	0%	0%	0%	38%	25%	25%	13%
BBB+	25%	25%	38%	38%	13%	25%	38%	38%
BBB	13%	13%	0%	0%	0%	0%	0%	0%
BBB-	13%	13%	13%	13%	13%	13%	0%	0%
Below BBB-	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Source: SNL Financials
Note: Subsidiary's ratings are used for NJR, SJI, SWX, UGI

II.B. Utility Credit Ratings and Security Valuation

Q HAVE CREDIT RATING AGENCIES COMMENTED ON DECLINING AUTHORIZED RETURNS ON EQUITY?

A Yes. Credit rating agencies recognize the declining trend in authorized returns and the expectation that regulators will continue lowering the returns for U.S. utilities while maintaining a stable credit profile. Specifically, Moody's states:

> **Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles**
>
> The credit profiles of US regulated utilities will remain intact over the next few years despite our expectation that regulators will continue to trim the sector's profitability by lowering its authorized returns on equity (ROE).[1]

Further, in a recent report, S&P states:

> **2. Earned returns will remain in line with authorized returns**

[1] *Moody's Investors Service*, "US Regulated Utilities: Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," March 10, 2015.

> Authorized returns on equity granted by U.S. utility regulators in rate cases this year have been steady at about 9.5%. Utilities have been adept at earning at or very near those authorized returns in today's economic and fiscal environment. A slowly recovering economy, natural gas and electric prices coming down and then stabilizing at fairly low levels, and the same experience with interest rates have led to a perfect "non-storm" for utility ratepayers and regulators, with utilities benefitting alongside those important constituencies. Utilities have largely used this protracted period of favorable circumstances to consolidate and institutionalize the regulatory practices that support earnings and cash flow stability. We have observed and we project continued use of credit-supportive policies such as short lags between rate filings and final decisions, up-to-date test years, flexible and dynamic tariff clauses for major expense items, and alternative ratemaking approaches that allow faster rate recognition for some new investments.[2]

Q HAVE UTILITIES BEEN ABLE TO ACCESS EXTERNAL CAPITAL TO SUPPORT INFRASTRUCTURE CAPITAL PROGRAMS?

A Yes. While cost of capital and authorized returns on equity were declining, the utility industry has been able to fund substantial increases in capital investments needed for infrastructure modernization and expansion. The Edison Electric Institute ("EEI") reported in a 2015 financial review of the electric industry financial performance that electric "industry-wide capex has more than doubled since 2005."[3]

EEI also observed that, despite this significant increase in capital expenditures during the period 2005-2015, a majority of the funding for utilities' capital expenditures has been provided by internal funds. EEI reports approximately 25% of funding needed to meet these increasing capital expenditures has been derived from external sources and 75% of these capital expenditures have been funded by internal

[2] *Standard & Poor's Ratings Services*: "Corporate Industry Credit Research: Industry Top Trends 2016, Utilities," December 9, 2015, at 23, emphasis added.

[3] Edison Electric Institute, *2015 Financial Review, Annual Report of the U.S. Investor-Owned Electric Utility Industry*, page 17.

cash. Further, despite nearly tripling capital expenditures, the electric utility industry debt interest expense has declined by approximately 1.9% despite increases in the amount of outstanding debt (and reductions to the cost of debt).[4] This is clear proof that utilities have enjoyed access to large amounts of capital, and that the costs of capital have declined.

Similarly, in its October 27, 2016 Capital Expenditure Update report, *RRA Financial Focus*, a division of S&P Global Market Intelligence, made several relevant comments about utility investments generally and gas delivery investments specifically:

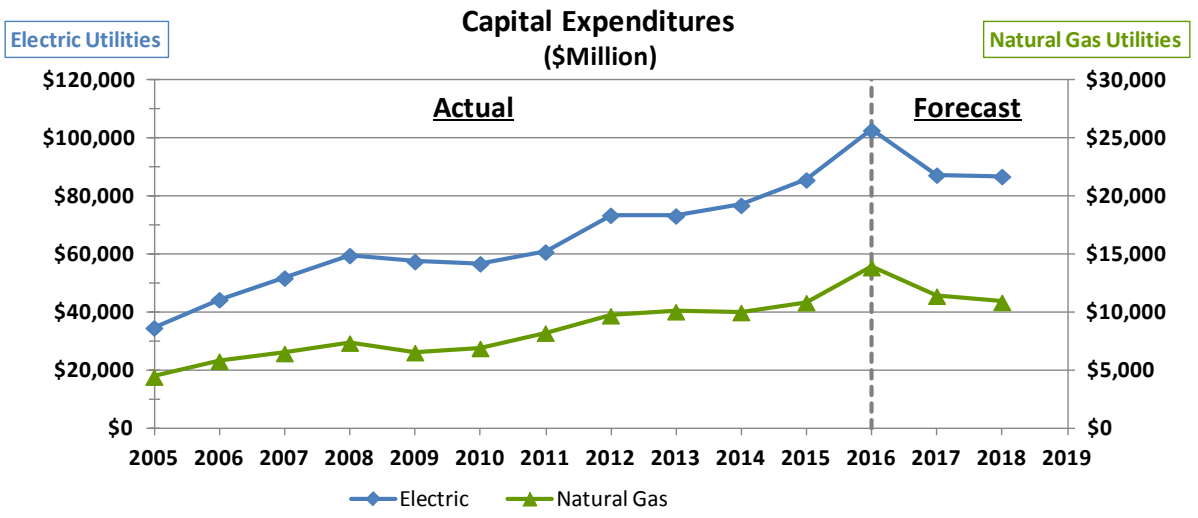
> Capital expenditures throughout the U.S. power and gas sectors in calendar-2016 are projected to be at an all-time high. The nation's largest electric and gas utilities are investing in infrastructure to comply with sweeping environmental regulations, implement new technologies, build new natural gas, solar and wind generation and upgrade aging transmission and distribution systems. Moreover, their near-term capital spending forecasts continue to escalate. Since our previous review of industry CapEx estimates, the utilities in the RRA Index have added about $11 billion of projects to their to-do lists for 2016-2018, according to our review of spending plans detailed in investor presentations. While most companies raised their forecasts or left them unchanged, a handful did reduce CapEx plans through 2018 (see below for individual examples.) Total CapEx in 2016 for the companies in the RRA Index is projected to be almost $117 billion.
>
> * * *
>
> From a natural gas perspective, many utilities are participating in the sizable and ongoing expansion of the nation's gas midstream network. In addition, replacement of mature gas distribution infrastructure has gained widespread momentum and is likely to continue at material levels for many years, considering state and federal mandates to address safety.
>
> * * *

[4] *Id*., pages 8 and 11.

> For gas utilities, the CapEx-to-operating cash flow ratio has fluctuated far more substantially than for electric utilities. Gas utilities saw large swings in the ratio from 2000 through 2012, with a peak of 1.6x in 2000 and a low of 0.7 in 2009. Since reaching 1.2x in 2012, the ratio appears to have stabilized somewhat, although 2015 was slightly lower at 1.0x.[5/]

Indeed, historical versus projected outlooks for the electric and gas industries' capital investments are shown in Figure 3 below. As shown in this graph, gas industry investment outlooks are expected to be considerably higher in the forecast (2016-2018), relative to the last 10-year historical period. As noted by S&P Global Market Intelligence, this capital investment is exceeding internal sources of funds to the gas utilities, requiring them to seek external capital to fund capital investments.

Figure 3



Source: *S&P Global Market Intelligence, Financial Focus*, Capital Expenditure Update, October 27, 2016, Page 7

As shown in Figure 3 above, the capital investments for the electric utility industry are significantly higher than the capital investments for the gas industry but they follow the same trend overt the historical and forecasted period.

[5]S&P Global Market Intelligence, RRA Financial Focus: "Capital Expenditure Update," October 27, 2016 at 1 and 5.

Q IS THERE EVIDENCE OF ROBUST VALUATIONS OF ELECTRIC AND GAS UTILITY SECURITIES?

A Yes. These robust valuations are an indication that utilities can sell securities at high prices, which is a strong indication that they can access capital under reasonable terms and conditions, and at relatively low cost. As shown on my Exhibit CCW-2, the historical valuation of the electric and gas utilities based on a price-to-earnings ratio, price-to-cash flow ratio and market price-to-book value ratio, indicates utility security valuations today are very strong and robust relative to the last 10 to 15 years. These strong valuations of utility stocks indicate that utilities have access to equity capital under reasonable terms and costs.

Q HOW SHOULD THE COMMISSION USE THIS MARKET INFORMATION IN ASSESSING A FAIR RETURN FOR LG&E?

A Market evidence is quite clear that capital market costs are near historically low levels. Authorized returns on equity have fallen to the low to mid 9.0% area; utilities continue to have access to large amounts of external capital to fund large capital programs; and utilities' investment grade credit standings are stable and have improved due, in part, to supportive regulatory treatment. The Commission should carefully weigh all this important observable market evidence in assessing a fair return on equity for LG&E.

II.C. Regulated Utility Industry Market Outlook

Q PLEASE DESCRIBE THE CREDIT RATING OUTLOOK FOR REGULATED UTILITIES.

A Regulated utilities' credit ratings have improved over the last few years and the outlook has been labeled "Stable" by credit rating agencies. Credit analysts have also observed that utilities have strong access to capital at attractive pricing (i.e., low capital costs), which has supported very large capital programs, as discussed above.

Standard & Poor's ("S&P") recently published a report titled "Corporate Industry Credit Research: Industry Top Trends 2016, Utilities." In that report, S&P noted the following:

> **Ratings Outlook.** Stable with a slight bias toward the negative. Utilities in the U.S. continue to enjoy a confluence of financial, economic, and regulatory environments that are tailor-made for supporting credit quality. Low interest rates, modest economic growth, and relatively stable commodity costs make for little pressure on rates and therefore on the sunny disposition of regulators.
>
> **Credit Metrics.** We see credit metrics remaining within historic norms for the industry as a whole and do not project overall financial performance that would affect the industry's creditworthiness.
>
> **Industry Trends.** Taking advantage of the favorable market conditions, utilities have been maintaining aggressive capital spending programs to bolster system safety and reliability, as well as technological advances to make the systems "smarter." The elevated spending has not led to large rate increases, but if macro conditions reverse and lead to rising costs that command higher rates, we would expect utilities to throttle back on spending to manage regulatory risk.[6]

Similarly, Fitch states:

> **Stable Financial Performance:** The stable financial performance of Utilities, Power & Gas (UPG) issuers continues to support a sound credit profile for the sector, with 93% of the UPG portfolio carrying

[6] *Standard & Poor's Ratings Services*: "Corporate Industry Credit Research: Industry Top Trends 2016, Utilities," December 9, 2015, at 22, emphasis added.

investment-grade ratings as of June 30, 2015, including 65% in the 'BBB' rating category. Second-quarter 2015 LTM [Long-Term Maturity] leverage metrics remained relatively unchanged year over year (YOY) while interest coverage metrics modestly improved. Fitch Ratings expects this trend to broadly sustain for the remainder of 2015, driven by positive recurring factors.

Low Debt-Funded Costs: The sustained low interest rate environment has allowed UPG companies to refinance high-coupon legacy debt with lower coupon new debt. Gross interest expense on an absolute value represented approximately 4.6% of total adjusted debt as of June 30, 2015, a decline of about 150 bps from the 6.1% recorded in the midst of the recession. Fitch believes a rise in interest rates would largely be neutral to credit quality, as issuers have generally built enough headroom in coverage metrics to withstand higher financing costs.

Capex Moderately Declining: Fitch expects the capex/depreciation ratio to be at the lower end of its five-year historical range of 2.0x–2.5x in the near term, reflecting a moderate decline in projected capex from the 2011–2014 highs. The capex depreciation ratio was relatively flat YOY at about 2.4x. Capex targets investments toward base infrastructure upgrades, utility-scale renewables and transmission investments.

* * *

Key credit metrics for IUCs [investor-owned utility companies] remained relatively stable YOY and continue to support the sound credit profiles and Stable Outlooks characteristic of the sector. EBITDAR [Earnings Before Interest, Taxes, Depreciation, Amortization and Rent] and FFO [Funds From Operations] coverage ratios were 5.6x and 5.9x, respectively, for the LTM ended second-quarter 2015, while adjusted debt/EDITDAR and FFO-adjusted leverage were 3.5x and 3.4x, respectively.[7]

Moody's recent comments on the U.S. Utility Sector state as follows:

2017 Outlook - Timely Cost-Recovery Drives Stable Outlook

Our outlook for the US regulated utilities industry is stable. This outlook reflects our expectations for the fundamental business conditions in the industry over the next 12 to 18 months.

[7] *Fitch Ratings*: "U.S. Utilities, Power & Gas Data Comparator," September 21, 2015, at 1 and 7, emphasis added.

> **A credit-supportive regulatory environment is the main driver of our stable outlook.** Our stable outlook for the US regulated utility industry is based on our expectation that utilities will continue to recover costs in a timely manner and maintain stable cash flows.
>
> **CFO-to-debt ratios will hold steady in 2017**. Utilities are contending with flat to lower power demand and lower allowed returns on equity. However, we expect that the continued use of cost-recovery mechanisms, the ongoing management of operating costs and extension of bonus depreciation will support cash flow, such that the industrywide average ratio of CFO to debt will remain at about 22% next year, in line with the 10-year average.
>
> * * *
>
> **What could change our outlook**. We could consider shifting our outlook to positive if the sector's average ratio of CFO to debt rose toward 25% on a sustainable basis, which could happen if utilities de-lever significantly, which we do not expect. A more contentious regulatory environment resulting in a material deterioration in cash flow, such that the ratio fell toward 18%, could cause us to take a negative view.[8]

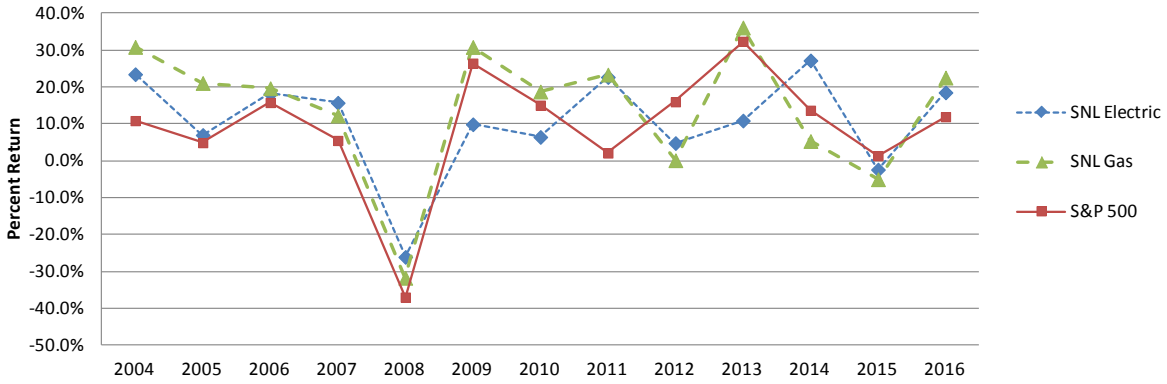
Q PLEASE DESCRIBE UTILITY STOCK PRICE PERFORMANCE OVER THE LAST SEVERAL YEARS.

As shown in Figure 4 below, SNL Financial has recorded utility stock price performance compared to the market. The industry's stock performance data from 2004 through September 2016 shows that the SNL Electric and Gas Company Indexes have outperformed the market in downturns and trailed the market during recovery. This relatively stable price performance for utilities supports my conclusion that utility stock investments are regarded by market participants as a moderate- to low-risk investment.

[8] *Moody's Investors Service*: "Regulated Utilities - US: 2017 Outlook – Timely Cost-Recovery Drives Stable Outlook," November 4, 2016, at 1, emphasis added.

FIGURE 4

Index Comparison



Source: SNL Financial.

Q HAVE ELECTRIC UTILITY INDUSTRY TRADE ORGANIZATIONS COMMENTED ON ELECTRIC UTILITY STOCK PRICE PERFORMANCE?

A Yes. In its 4th Quarter 2016 Financial Update, the EEI stated the following concerning the EEI Electric Utility Stock Index ("EEI Index"):

> **Industry Fundamentals Remain Stable**
>
> There was little meaningful change in the industry's fundamental picture during 2016. Electricity demand remained virtually flat; total electric output rose only 0.2% over the level in 2015 in the lower 48 states. Nationwide power demand has, in fact, been about flat for a decade. . . In response, a number of state utility commissions have adapted rate designs that help utilities cope with flat demand while still enabling investment required to comply with environmental requirements, grid modernization and upgrades to vital infrastructure. Nevertheless, the outlook for flat demand is a "new normal" that represents a departure from the consistent demand growth that characterized the industry's experience for more than a century.
>
> * * *
>
> While utility regulation largely occurs at the state level and must be analyzed state by state, industry analysts at yearend generally viewed regulation as largely fair and balanced overall for the industry taken as a whole. While allowed return on equity has come down in recent

> years, so have interest rates. Moody's in early 2017 called the industry's credit outlook "stable" based on expectation that utilities will continue to recover costs in a timely manner and maintain stable cash flows.
>
> * * *
>
> The industry is now focused largely on regulated businesses with a strong 3.4% dividend yield (at December 31, 2016), healthy balance sheets and the chance to drive the nation's ongoing transition to cleaner energy and a modernized grid. The classic 20th century utility formula — slow earnings and dividend growth — should continue to attract investors. Provided inflation doesn't surge and produce sharply higher interest rates, utility shares should continue to do well on a relative (and possibly absolute) basis when bearish sentiment dominates the broader stock market.[9]

Q HAVE YOU CONSIDERED CONSENSUS MARKET OUTLOOKS FOR CHANGES IN INTEREST RATES IN FORMING YOUR RECOMMENDED RETURN ON EQUITY IN THIS CASE?

A Yes. The outlook for changes in interest rates has been highly impacted by expected actions by the Federal Reserve Bank Open Market Committee ("FOMC") changes in short-term interest rates, and outlooks for inflation and GDP growth after the recent Presidential election. The most recent consensus outlook on these factors is stated in the December 2016 *Blue Chip Financial Forecasts* as follows:

> At present, our panelists seem much more skeptical than fixed income market participants that economic growth, inflation, or both will shoot higher over the next year and a half. There was very little change over the past month in consensus forecasts of economic growth and inflation over the forecast horizon. While annual real GDP growth in 2017 is expected to exceed that in 2016, it still is forecast to closely adhere to the slightly more than 2.0% average that has prevailed since the end of the Great Recession. Consensus forecasts of inflation also underwent little change this month. The GDP price index still is expected to

[9] *EEI Q4 2016 Financial Update*: "Stock Performance" at 5-6, emphasis added.

> register annualized rates of increase of slightly more than 2.0% through Q1 2018, while the Consumer Price Index is forecast to post annualized rates of increase about 0.2 of a percentage point greater than that.
>
> * * *
>
> All of our panelists also expect the FOMC to hike rates by a quarter-point in December, according to a special question asked of our panelists this month. We also saw some upward adjustment to consensus forecasts of interest rates and yields over the forecast horizon. However, it seemed to largely reflect a simple mark-to-marking of forecasts given the post-election run-up in interest rates. Yes, the consensus still looks for rates and yields to rise over the forecasts horizon, but not at the breakneck pace seen in the immediate post-election period. As for FOMC rate hikes in 2017, 28.9% of our panelists currently foresee only one 25 basis points increase next year, 40.0% see two 25-basis-point increases, 17.8% expect three quarter-point moves, and 13.3% said they anticipate the FOMC to hike rates by 25 basis points four or more times.[10]

Based on these current outlooks, the consensus 30-year Treasury bond yield projections forecast an increase from current yields of 3.0% or less, up to 3.7% out over the next two years. Further, long-term outlooks are for the Federal Reserve Funds to increase up to as much as 2.6% to 3% over the five- to 10-year forecast, with 30-year Treasury bond yields increasing to 4.2% to 4.5% over that same time period. These outlooks for short-term and long-term interest rate changes are reflected in my market-based models and inputs used to estimate a fair return on equity for LG&E in this proceeding.

I also note that the current outlook for interest rate increases over the short-term and intermediate-term forecasts is for increases, but these expectations of increased interest rates have consistently been reflected in analysts' past interest rate projections but those projections have consistently turned out to be wrong. That is,

[10] *Blue Chip Financial Forecasts*, December 1, 2016 at 1, emphasis added.

interest rates were projected to increase, but instead have stayed flat or declined. As such, while I am considering the expectation of increased capital market costs in the future, I must note that the certainty of increases in capital market costs and timing of changes to capital market costs are at very best uncertain.

Q WHAT ARE THE IMPORTANT TAKEAWAY POINTS FROM THIS ASSESSMENT OF UTILITY INDUSTRY CREDIT AND INVESTMENT RISK OUTLOOKS?

A Credit rating agencies consider the regulated utility industry to be "Stable" and believe investors will continue to provide an abundance of low-cost capital to support utilities' large capital programs at attractive costs and terms. All of this reinforces my belief that utility investments are generally regarded as safe-haven or low-risk investments and the market continues to demand low-risk investments such as utility securities. The ongoing demand for low-risk investments can reasonably be expected to continue to provide attractive low-cost capital for regulated utilities.

II.D. LG&E Investment Risk

Q PLEASE DESCRIBE THE MARKET'S ASSESSMENT OF THE INVESTMENT RISK OF LG&E.

A The market's assessment of LG&E's investment risk is described by credit rating analysts' reports. LG&E's current corporate bond ratings from S&P and Moody's are

A- and A3, respectively.[11] LG&E's outlook from both credit rating agencies is "Stable." Specifically, S&P states:

> **Outlook: Stable**
>
> The stable rating outlook on Louisville Gas & Electric Co. (LG&E) reflects our rating outlook on its parent, PPL Corp. (PPL), because we view LG&E as a core subsidiary of its parent. The stable outlook on PPL is based on the company's regulated utility strategy that leads to very low business risk and credit metrics on the lower end of the significant financial risk profile range. Under our base-case scenario we expect that funds from operations (FFO) to debt will range from 13%-14% while debt to EBITDA will remain elevated at over 5x.
>
> **Business Risk: Excellent**
>
> We assess LG&E's business risk profile based primarily on the company's regulated integrated electric utility and natural gas distribution operations under the generally constructive regulatory framework in Kentucky.
>
> LG&E has limited scale, scope, and diversity, serving a relatively small customer base of about 400,000 electric and about 320,000 natural gas customers in Louisville and surrounding areas. The customer base consists largely of residential and commercial customers, insulating the company from fluctuations in demand and providing stability to the company's cash flows. Our assessment also accounts for the modest operating diversity of the company due to its electric and natural gas operations.
>
> The company has about 3,000 megawatts of generation capacity, which has higher operating risk than T&D operations. The company has been upgrading its coal-fired generation plants to comply with environmental regulations. While the capital costs of these upgrades are significant, spending can be recovered through an environmental cost recovery mechanism which limits regulatory lag and is supportive of the credit profile. Under the regulation of the Kentucky Public Service Commission (PSC), the company benefits from other mechanisms such as a gas line tracker and a pass-through fuel cost mechanism. These mechanisms increase the stability of the company's returns.
>
> Moreover, the company's low-cost coal-fired generation and efficient operations contribute to overall competitive rates for customers.

[11] McKenzie Direct at 14 and 23.

Financial Risk: Significant

Under our base-case scenario, we project LG&E's core ratios will remain at the higher end of significant category, with FFO to debt ranging from 20%-22% and debt to EBITDA that remains about 3.5x. Over the next few years, we expect credit measures to benefit from use of regulatory mechanisms to recover its invested capital.

We base our assessment of LG&E's financial risk on the medial volatility financial ratio benchmarks, reflecting the company's low-risk regulated electric T&D and natural gas distribution operations, which is partially offset by the relatively higher risk regulated generation.[12]

Similarly, Moody's states:

Rating Outlook

LG&E's stable outlook reflects its supportive regulatory environment in Kentucky and stable financial performance.

* * *

- Supportive regulatory environment provides timely cost recovery

We consider the Kentucky Public Service Commission (KPSC) to be supportive of long-term credit quality and note that it has approved various tracker mechanisms that provide for timely cost recovery outside of a rate case, shortening regulatory lag. LG&E's tracker mechanisms include a Fuel Adjustment Clause (FAC), an Environmental Cost Recovery Surcharge (ECR), a Gas Supply Clause (GSC), a Gas Line Tracker (GLT) and a Demand-Side Management (DSM) Cost Recovery Mechanism. LG&E does not have a decoupling mechanism in place, which subjects LG&E's net revenue to weather volatilities. The lack of a decoupling mechanism is less of an issue for non-weather related demand fluctuations because LG&E has the DSM mechanism and expects to have modest load growth in 2017.

In January 2016, LG&E and affiliate utility Kentucky Utilities (KU, A3 stable) submitted applications to the KPSC, requesting the ECR rate treatment for projects related to the US Environmental Protection Agency's (EPA) regulations addressing the handling of coal and combustion by-products and MATS (mercury and air toxics standards). The projects are expected to commence in the second half of 2016 and are estimated to cost approximately $316 million and $678 million, respectively, for LG&E and KU. On 8 August 2016 the KPSC

[12]Standard & Poor's RatingsDirect: " Louisville Gas & Electric Co." October 24, 2016.

approved the settlement and authorized a 9.8% return on equity (ROE) for the projects.

LG&E's last general rate case concluded in June 2015 when its case was settled. Although the settlement did not provide any revenue increase for LG&E's electric operations, it authorized a $7 million revenue increase for its gas operations. In addition, the settlement agreed to a 10% ROE for the ECR and GLT riders. It also provided for deferred cost recovery of a portion of the costs related to pensions.

* * *

- Stable financial profile supports robust capex

LG&E's financial metrics have been strong for its rating. As of 30 June 2016, the ratio of consolidated cash flow before changes in working capital (CFO pre-WC) to debt was 24% for the last twelve months and averaged 27% for the past three years. Debt to capitalization was 36% for the last twelve months and averaged 37% for the past three years. We expect LG&E's financial metrics to remain at similar levels over the next few years as it benefits from the extension of bonus depreciation tax credit while the large capital expenditure program continues. We expect LG&E's financial metrics to remain supportive of its rating levels based on the targeted capital structure of 52% equity, which is calculated net of goodwill and Moody's standard adjustments. LG&E's goodwill amounted to $389 million at the end of June 2016 and in comparison total equity, including the goodwill, was $2.4 billion.[13]

III. LG&E'S PROPOSED CAPITAL STRUCTURE

Q WHAT IS LG&E'S PROPOSED CAPITAL STRUCTURE?

A LG&E's proposed capital structure is shown below in Table 3. This pro forma capital structure ending on June 30, 2018 is sponsored by LG&E witness Mr. Daniel K. Arbough.

[13] *Moody's Investors Service*: "Credit Opinion: Louisville Gas & Electric Company," October 28, 2016, provided by LG&E as Attachment to Response to AG-1 Question No. 266, pages 14-16, emphasis added.

TABLE 3

LG&E's Proposed Capital Structure
(June 30, 2018)

Description	Weight
Short-Term Debt	3.82%
Long-Term Debt	42.91%
Common Equity	53.27%
Total	100.00%

Source: Schedule J-1.1/J-1.2.

Q IS LG&E'S PROPOSED CAPITAL STRUCTURE REASONABLE?

A No. LG&E's proposed capital structure contains an excessive amount of common equity capital. I reached this conclusion based on an assessment of LG&E's capital structure reviewed by credit rating agencies in assessing its credit strength, a comparison of LG&E's capital structure to the capital structures approved by regulatory commissions for other utility companies, and the capital structure of the proxy group companies used to set LG&E's return on equity in this proceeding.

Q PLEASE DESCRIBE WHY YOU BELIEVE LG&E'S CAPITAL STRUCTURE CONTAINS MORE COMMON EQUITY THAN NECESSARY TO SUPPORT ITS CURRENT INVESTMENT GRADE BOND RATING.

A In its assessment of the total financial risk of LG&E and other utilities, S&P considers both on balance sheet debt obligations and off balance sheet debt obligations. Off balance sheet debt obligations include the debt-like characteristics such as purchased

power obligations, operating leases, and other financial obligations that are not capitalized on a utility's balance sheet. In assessing the financial risk of a utility, S&P considers an "adjusted" debt ratio which includes both on balance sheet debt obligations and off balance sheet debt obligations.

Based on LG&E's proposed capital structure, its adjusted debt ratio would be approximately 48% as shown on page 3 of Exhibit CCW-18.

LG&E's adjusted debt ratio is significantly lower than that of industry medians for comparable bond ratings, thus illustrating that its debt ratio is too low, and its common equity ratio is too high. For example, as shown in Table 4 below, this adjusted debt ratio for LG&E would be considerably lower than the median adjusted debt ratios for the utility industry based on Standard & Poor's methodology. For utility companies with an A- rating, the industry average adjusted debt ratio is around 52%. This would imply the average adjusted common equity components of total capitalization including off-balance sheet debt of around 48%.

TABLE 4

Operating Utility Subsidiaries
(Industry Medians)

S&P Rating[1]	Adj. Debt Ratio (1)	Distribution (50% - 55%) (2)
AA-	42.6%	–
A	51.5%	78%
A-	51.7%	35%
BBB+	54.3%	37%
BBB	52.9%	38%
LG&E	48.0%	

[1]Exhibit CCW-18, page 4.

As shown in Table 4 above, LG&E currently has a bond rating of A- from S&P, but its adjusted debt ratio is in line with a credit rating considerably stronger than A-. As illustrated in Table 4 above, LG&E's capital structure simply contains too much common equity and much less debt than would support its investment grade bond rating.

Q HOW DOES LG&E'S PROPOSED CAPITAL STRUCTURE COMMON EQUITY RATIO COMPARE TO THAT APPROVED FOR ELECTRIC UTILITIES FOR RATEMAKING PURPOSES?

A A comparison of LG&E's proposed capital structure common equity to that of the electric utility industry approved capital structure is shown below in Table 5. LG&E's

proposed 53.27% common equity ratio is considerably higher than the electric and gas utility industry average common equity ratios of approximately 50% over the period 2010-2016. Indeed, the industry average common equity ratio has been relatively stable over this time period. Support for this finding is shown below in Table 5.

TABLE 5

Trends in
State Authorized Common Equity Ratios

Line	Year	Utility Industry* Average	Utility Industry* Median
	(1)	(2)	(3)
1	2010	49.4%	49.8%
2	2011	50.0%	50.6%
3	2012	51.3%	51.8%
4	2013	50.5%	50.8%
5	2014	51.0%	50.4%
6	2015	50.1%	50.5%
7	2016	50.3%	50.0%
8	**Average**	**50.4%**	**50.6%**
9	Min	49.4%	49.8%
10	Max	51.3%	51.8%
11	**Midpoint**	**50.4%**	**50.8%**
12	**LG&E Proposed**		**53.27%**

Source:
SNL Financial, downloaded on March 1, 2017.
*Excludes authorized common equity ratios decided in Arkansas, Florida, Indiana and Michigan.

As shown in Table 5 above, LG&E's proposed capital structure contains far more common equity than that of other electric and gas utilities for ratemaking purposes. Importantly, as I discuss above, the utility industry generally is able to

access large amounts of capital to support its capital program, and its bond rating has improved. Therefore, this comparison of LG&E's proposed capital structure to that of the utility industry strongly supports my conclusion that LG&E's capital structure contains an unreasonably high amount of common equity.

Q WHY DO YOU BELIEVE THAT LG&E'S COMMON EQUITY RATIO IS MUCH HIGHER THAN THE COMMON EQUITY RATIOS OF COMPARABLE RISK PROXY COMPANIES TO WHICH YOU WILL MEASURE LG&E'S RETURN ON EQUITY?

A As discussed later in my testimony, the average common equity ratio for my proxy group used to estimate LG&E's current market cost of equity is approximately 45.4%, including short-term debt. LG&E's proposed ratemaking capital structure including a 53.27% common equity ratio is significantly higher and simply unreasonable.

Q WHY WOULD A CAPITAL STRUCTURE TOO HEAVILY WEIGHTED WITH COMMON EQUITY UNNECESSARILY INCREASE LG&E'S COST OF SERVICE IN THIS PROCEEDING?

A A capital structure too heavily weighted with common equity unnecessarily increases LG&E's claimed revenue deficiency because common equity is the most expensive form of capital and is subject to income tax expense. For example, if LG&E's authorized return on equity is set at 9.0%, the revenue requirement cost to customers would be approximately 14.4%, which includes the 9.0% after-tax return and the related income expense of 5.4%, which is based on the tax conversion factor of

approximately 1.6x. (9.0% times 1.6x less 9.0%). In contrast, the cost of debt capital is not subject to an income tax expense. LG&E's proposed embedded cost of debt is 4.12%. Common equity is more than three times as expensive on a revenue requirement basis than debt capital.

A reasonable mix of debt and equity is necessary in order to balance LG&E's financial risk, support an investment grade credit rating, and permit LG&E access to capital under reasonable terms and prices. However, a capital structure too heavily weighted with common equity will unnecessarily increase its cost of capital and revenue requirement for ratepayers.

Q ARE YOU RECOMMENDING AN ADJUSTMENT TO LG&E'S PROPOSED CAPITAL STRUCTURE AT THIS TIME?

A No, I am not. Rather than making an explicit adjustment to LG&E's proposed capital structure, I considered its impact in making my recommended return on equity. Because of LG&E's equity-thick capital structure, I believe my recommendation is reasonable, if not, conservative.

III.A. Embedded Cost of Debt

Q WHAT IS THE COMPANY'S EMBEDDED COST OF DEBT?

A Mr. Arbough is proposing an embedded cost of long-term debt of 4.12% as developed on his Schedule J-3, page 3.

IV. RETURN ON EQUITY

Q PLEASE DESCRIBE WHAT IS MEANT BY A "UTILITY'S COST OF COMMON EQUITY."

A A utility's cost of common equity is the expected return that investors require on an investment in the utility. Investors expect to earn their required return from receiving dividends and through stock price appreciation.

Q PLEASE DESCRIBE THE FRAMEWORK FOR DETERMINING A REGULATED UTILITY'S COST OF COMMON EQUITY.

A In general, determining a fair cost of common equity for a regulated utility has been framed by two hallmark decisions of the U.S. Supreme Court: Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n of W. Va., 262 U.S. 679 (1923) and Fed. Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591 (1944).

These decisions identify the general financial and economic standards to be considered in establishing the cost of common equity for a public utility. Those general standards provide that the authorized return should: (1) be sufficient to maintain financial integrity; (2) attract capital under reasonable terms; and (3) be commensurate with returns investors could earn by investing in other enterprises of comparable risk.

Q PLEASE DESCRIBE THE METHODS YOU HAVE USED TO ESTIMATE LG&E'S COST OF COMMON EQUITY.

A I have used several models based on financial theory to estimate LG&E's cost of common equity. These models are: (1) a constant growth Discounted Cash Flow ("DCF") model using consensus analysts' growth rate projections; (2) a constant growth DCF using sustainable growth rate estimates; (3) a multi-stage growth DCF model; (4) a Risk Premium model; and (5) a Capital Asset Pricing Model ("CAPM"). I have applied these models to a group of publicly traded utilities with investment risk similar to LG&E.

IV.A. Risk Proxy Group

Q PLEASE DESCRIBE HOW YOU IDENTIFIED A PROXY UTILITY GROUP THAT COULD BE USED TO REASONABLY REFLECT THE INVESTMENT RISK OF LG&E AND USED TO ESTIMATE ITS CURRENT MARKET COST OF EQUITY.

A I relied on the same proxy group developed by LG&E witness Mr. McKenzie. However, I would point out that he included Avangrid, Inc., which was recently formed through a merger between Iberdola USA, Inc. and UIL Holdings Corporation. The transaction was finalized in December 2015. Even though there is limited publicly available data for this newly formed company, to limit my concerns with Mr. McKenzie's testimony in this regulatory proceeding, I will not take issue with the inclusion of Avangrid in the proxy group.

Q PLEASE DESCRIBE WHY YOU BELIEVE YOUR PROXY GROUP IS REASONABLY COMPARABLE IN INVESTMENT RISK TO LG&E.

A The proxy group is shown in Exhibit CCW-3. The proxy group has an average corporate credit rating from S&P of BBB+, which is slightly lower than S&P's corporate credit rating for LG&E of A-. The proxy group has an average corporate credit rating from Moody's of Baa1, which is also a notch lower than LG&E's corporate credit rating from Moody's of A3. Based on this information, I believe my proxy group has slightly higher but reasonably comparable investment risk to LG&E. Therefore, the return on equity produced by my proxy group is conservative.

The proxy group has an average common equity ratio of 45.4% (including short-term debt) from SNL Financial ("SNL") and 48.0% (excluding short-term debt) from *The Value Line Investment Survey* ("*Value Line*").

The Company's proposed common equity ratio of 53.3% is significantly higher than the proxy group common equity ratio, which means that my proxy group has higher financial risk and will produce a conservative return on equity for LG&E. Based on these risk factors, I conclude the proxy group reasonably approximates the investment risk of LG&E and produces a conservative return on equity estimate for LG&E.

IV.B. Discounted Cash Flow Model

Q PLEASE DESCRIBE THE DCF MODEL.

A The DCF model posits that a stock price is valued by summing the present value of expected future cash flows discounted at the investor's required rate of return or cost of capital. This model is expressed mathematically as follows:

$$P_0 = \frac{D_1}{(1+K)^1} + \frac{D_2}{(1+K)^2} + \ldots + \frac{D_\infty}{(1+K)^\infty} \qquad \text{(Equation 1)}$$

P_0 = Current stock price
D = Dividends in periods 1 - ∞
K = Investor's required return

This model can be rearranged in order to estimate the discount rate or investor-required return otherwise known as "K." If it is reasonable to assume that earnings and dividends will grow at a constant rate, then Equation 1 can be rearranged as follows:

$$K = D_1/P_0 + G \qquad \text{(Equation 2)}$$

K = Investor's required return
D_1 = Dividend in first year
P_0 = Current stock price
G = Expected constant dividend growth rate

Equation 2 is referred to as the annual "constant growth" DCF model.

Q PLEASE DESCRIBE THE INPUTS TO YOUR CONSTANT GROWTH DCF MODEL.

A As shown in Equation 2 above, the DCF model requires a current stock price, expected dividend, and expected growth rate in dividends.

Q WHAT STOCK PRICE HAVE YOU RELIED ON IN YOUR CONSTANT GROWTH DCF MODEL?

A I relied on the average of the weekly high and low stock prices of the utilities in the proxy group over a 13-week period ending on February 3, 2017. An average stock price is less susceptible to market price variations than a price at a single point in time. Therefore, an average stock price is less susceptible to aberrant market price movements, which may not reflect the stock's long-term value.

A 13-week average stock price reflects a period that is still short enough to contain data that reasonably reflects current market expectations but the period is not so short as to be susceptible to market price variations that may not reflect the stock's long-term value. In my judgment, a 13-week average stock price is a reasonable balance between the need to reflect current market expectations and the need to capture sufficient data to smooth out aberrant market movements.

Q WHAT DIVIDEND DID YOU USE IN YOUR CONSTANT GROWTH DCF MODEL?

A I used the most recently paid quarterly dividend as reported in *Value Line*.[14] This dividend was annualized (multiplied by 4) and adjusted for next year's growth to produce the D1 factor for use in Equation 2 above.

[14] *The Value Line Investment Survey*, November 18, December 16, 2016 and January 27, 2017.

Q WHAT DIVIDEND GROWTH RATES HAVE YOU USED IN YOUR CONSTANT GROWTH DCF MODEL?

A There are several methods that can be used to estimate the expected growth in dividends. However, regardless of the method, for purposes of determining the market-required return on common equity, one must attempt to estimate investors' consensus about what the dividend, or earnings growth rate, will be, and not what an individual investor or analyst may use to make individual investment decisions.

As predictors of future returns, security analysts' growth estimates have been shown to be more accurate than growth rates derived from historical data.[15] That is, assuming the market generally makes rational investment decisions, analysts' growth projections are more likely to influence investors' decisions which are captured in observable stock prices than growth rates derived only from historical data.

For my constant growth DCF analysis, I have relied on a consensus, or mean, of professional security analysts' earnings growth estimates as a proxy for investor consensus dividend growth rate expectations. I used the average of analysts' growth rate estimates from three sources: Zacks, SNL, and Reuters. All such projections were available on February 3, 2017, and all were reported online.

Each consensus growth rate projection is based on a survey of security analysts. There is no clear evidence whether a particular analyst is most influential on general market investors. Therefore, a single analyst's projection does not as reliably predict consensus investor outlooks as does a consensus of market analysts' projections. The consensus estimate is a simple arithmetic average, or mean, of

[15] *See, e.g.,* David Gordon, Myron Gordon, and Lawrence Gould, "Choice Among Methods of Estimating Share Yield," *The Journal of Portfolio Management*, Spring 1989.

surveyed analysts' earnings growth forecasts. A simple average of the growth forecasts gives equal weight to all surveyed analysts' projections. Therefore, a simple average, or arithmetic mean, of analyst forecasts is a good proxy for market consensus expectations.

Q WHAT ARE THE GROWTH RATES YOU USED IN YOUR CONSTANT GROWTH DCF MODEL?

A The growth rates I used in my DCF analysis are shown in Exhibit CCW-4. The average growth rate for my proxy group is 5.44%.

Q WHAT ARE THE RESULTS OF YOUR CONSTANT GROWTH DCF MODEL?

A As shown in Exhibit CCW-5, the average and median constant growth DCF returns for my proxy group for the 13-week analysis are 9.20% and 9.10%, respectively.

Q DO YOU HAVE ANY COMMENTS ON THE RESULTS OF YOUR CONSTANT GROWTH DCF ANALYSIS?

A Yes. The constant growth DCF analysis for my proxy group is based on a group average long-term sustainable growth rate of 5.44%. The three- to five-year growth rates are higher than my estimate of a maximum long-term sustainable growth rate of 4.25%, which I discuss later in this testimony. Further, the results of my constant growth DCF results are highly dispersed, ranging from 5.60% to 13.34%. Therefore, I will place primary weight on the median results, which represent a better estimate of

the central tendency of my proxy group. I believe the constant growth DCF analysis produces a reasonable high-end return estimate.

Q HOW DID YOU ESTIMATE A MAXIMUM LONG-TERM SUSTAINABLE GROWTH RATE?

A A long-term sustainable growth rate for a utility stock cannot exceed the growth rate of the economy in which it sells its goods and services. Hence, the long-term maximum sustainable growth rate for a utility investment is best proxied by the projected long-term Gross Domestic Product ("GDP"). *Blue Chip Financial Forecasts* projects that over the next 5 and 10 years, the U.S. nominal GDP will grow approximately 4.25%. These GDP growth projections reflect a real growth outlook of around 2.2% and an inflation outlook of around 2.0% going forward. As such, the average growth rate over the next 10 years is around 4.25%, which I believe is a reasonable proxy of long-term sustainable growth.[16]

In my multi-stage growth DCF analysis, I discuss academic and investment practitioner support for using the projected long-term GDP growth outlook as a maximum sustainable growth rate projection. Hence, recognizing the long-term GDP growth rate as a maximum sustainable growth is logical, and is generally consistent with academic and economic practitioner accepted practices.

[16] *Blue Chip Financial Forecasts*, December 1, 2016, at 14.

IV.C. Sustainable Growth DCF

Q PLEASE DESCRIBE HOW YOU ESTIMATED A SUSTAINABLE LONG-TERM GROWTH RATE FOR YOUR SUSTAINABLE GROWTH DCF MODEL.

A A sustainable growth rate is based on the percentage of the utility's earnings that is retained and reinvested in utility plant and equipment. These reinvested earnings increase the earnings base (rate base). Earnings grow when plant funded by reinvested earnings is put into service, and the utility is allowed to earn its authorized return on such additional rate base investment.

The internal growth methodology is tied to the percentage of earnings retained in the company and not paid out as dividends. The earnings retention ratio is 1 minus the dividend payout ratio. As the payout ratio declines, the earnings retention ratio increases. An increased earnings retention ratio will fuel stronger growth because the business funds more investments with retained earnings.

The payout ratios of the proxy group are shown in my Exhibit CCW-6. These dividend payout ratios and earnings retention ratios then can be used to develop a sustainable long-term earnings retention growth rate. A sustainable long-term earnings retention ratio will help gauge whether analysts' current three- to five-year growth rate projections can be sustained over an indefinite period of time.

The data used to estimate the long-term sustainable growth rate is based on the Company's current market-to-book ratio and on *Value Line*'s three- to five-year projections of earnings, dividends, earned returns on book equity, and stock issuances.

As shown in Exhibit CCW-7, the average sustainable growth rate for the proxy group using this internal growth rate model is 4.74%.

Q WHAT IS THE DCF ESTIMATE USING THESE SUSTAINABLE LONG-TERM GROWTH RATES?

A A DCF estimate based on these sustainable growth rates is developed in Exhibit CCW-8. As shown there, a sustainable growth DCF analysis produces proxy group average and median DCF results for the 13-week period of 8.53% and 8.24%, respectively.

IV.D. Multi-Stage Growth DCF Model

Q HAVE YOU CONDUCTED ANY OTHER DCF STUDIES?

A Yes. My first constant growth DCF is based on consensus analysts' growth rate projections so it is a reasonable reflection of rational investment expectations over the next three to five years. The limitation on this constant growth DCF model is that it cannot reflect a rational expectation that a period of high or low short-term growth can be followed by a change in growth to a rate that is more reflective of long-term sustainable growth. Hence, I performed a multi-stage growth DCF analysis to reflect this outlook of changing growth expectations.

Q WHY DO YOU BELIEVE GROWTH RATES CAN CHANGE OVER TIME?

A Analyst-projected growth rates over the next three to five years will change as utility earnings growth outlooks change. Utility companies go through cycles in making

investments in their systems. When utility companies are making large investments, their rate base grows rapidly, which in turn accelerates earnings growth. Once a major construction cycle is completed or levels off, growth in the utility rate base slows and its earnings growth slows from an abnormally high three- to five-year rate to a lower sustainable growth rate.

As major construction cycles extend over longer periods of time, even with an accelerated construction program, the growth rate of the utility will slow simply because rate base growth will slow and the utility has limited human and capital resources available to expand its construction program. Therefore, the three- to five-year growth rate projection should be used as a long-term sustainable growth rate, but not without making a reasonable informed judgment to determine whether it considers the current market environment, the industry, and whether the three- to five-year growth outlook is sustainable.

Q PLEASE DESCRIBE YOUR MULTI-STAGE GROWTH DCF MODEL.

A The multi-stage growth DCF model reflects the possibility of non-constant growth for a company over time. The multi-stage growth DCF model reflects three growth periods: (1) a short-term growth period consisting of the first five years; (2) a transition period, consisting of the next five years (6 through 10); and (3) a long-term growth period starting in year 11 through perpetuity.

For the short-term growth period, I relied on the consensus analysts' growth projections described above in relationship to my constant growth DCF model. For the transition period, the growth rates were reduced or increased by an equal factor

reflecting the difference between the analysts' growth rates and the long-term sustainable growth rate. For the long-term growth period, I assumed each company's growth would converge to the maximum sustainable long-term growth rate.

Q WHY IS THE GDP GROWTH PROJECTION A REASONABLE PROXY FOR THE MAXIMUM SUSTAINABLE LONG-TERM GROWTH RATE?

A Utilities cannot indefinitely sustain a growth rate that exceeds the growth rate of the economy in which they sell services. Utilities' earnings/dividend growth is created by increased utility investment or rate base. Such investment, in turn, is driven by service area economic growth and demand for utility service. In other words, utilities invest in plant to meet sales demand growth. Sales growth, in turn, is tied to economic growth in their service areas.

The U.S. Department of Energy, Energy Information Administration ("EIA") has observed utility sales growth tracks the U.S. GDP growth, albeit at a lower level, as shown in Exhibit CCW-9. Utility sales growth has lagged behind GDP growth for more than a decade. As a result, nominal GDP growth is a very conservative proxy for utility sales growth, rate base growth, and earnings growth. Therefore, the U.S. GDP nominal growth rate is a conservative proxy for the highest sustainable long-term growth rate of a utility.

Q IS THERE RESEARCH THAT SUPPORTS YOUR POSITION THAT, OVER THE LONG TERM, A COMPANY'S EARNINGS AND DIVIDENDS CANNOT GROW AT A RATE GREATER THAN THE GROWTH OF THE U.S. GDP?

A Yes. This concept is supported in published analyst literature and academic work. Specifically, in a textbook titled "Fundamentals of Financial Management," published by Eugene Brigham and Joel F. Houston, the authors state as follows:

> The constant growth model is most appropriate for mature companies with a stable history of growth and stable future expectations. Expected growth rates vary somewhat among companies, but dividends for mature firms are often expected to grow in the future at about the same rate as nominal gross domestic product (real GDP plus inflation).[17]

The use of the economic growth rate is also supported by investment practitioners:

> **Estimating Growth Rates**
>
> One of the advantages of a three-stage discounted cash flow model is that it fits with life cycle theories in regards to company growth. In these theories, companies are assumed to have a life cycle with varying growth characteristics. Typically, the potential for extraordinary growth in the near term eases over time and eventually growth slows to a more stable level.
>
> * * *
>
> Another approach to estimating long-term growth rates is to focus on estimating the overall economic growth rate. Again, this is the approach used in the *Ibbotson Cost of Capital Yearbook*. To obtain the economic growth rate, a forecast is made of the growth rate's component parts. Expected growth can be broken into two main parts: expected inflation and expected real growth. By analyzing these components separately, it is easier to see the factors that drive growth.[18]

[17] *"Fundamentals of Financial Management*," Eugene F. Brigham and Joel F. Houston, Eleventh Edition 2007, Thomson South-Western, a Division of Thomson Corporation at 298, emphasis added.

[18] *Morningstar, Inc., Ibbotson SBBI 2013 Valuation Yearbook* at 51 and 52.

Q IS THERE ANY ACTUAL INVESTMENT HISTORY THAT SUPPORTS THE NOTION THAT THE CAPITAL APPRECIATION FOR STOCK INVESTMENTS WILL NOT EXCEED THE NOMINAL GROWTH OF THE U.S. GDP?

A Yes. This is evident by a comparison of the compound annual growth of the U.S. GDP compared to the geometric growth of the U.S. stock market. Duff & Phelps measures the historical geometric growth of the U.S. stock market over the period 1926-2015 to be approximately 5.8%. During this same time period, the U.S. nominal compound annual growth of the U.S. GDP was approximately 6.2%.[19]

As such, the compound geometric growth of the U.S. nominal GDP has been higher but comparable to the nominal growth of the U.S. stock market capital appreciation. This historical relationship indicates that the U.S. GDP growth outlook is a conservative estimate of the long-term sustainable growth of U.S. stock investments.

Q HOW DID YOU DETERMINE A SUSTAINABLE LONG-TERM GROWTH RATE THAT REFLECTS THE CURRENT CONSENSUS OUTLOOK OF THE MARKET?

A I relied on the consensus analysts' projections of long-term GDP growth. *Blue Chip Financial Forecasts* publishes consensus economists' GDP growth projections twice a year. These consensus analysts' GDP growth outlooks are the best available measure of the market's assessment of long-term GDP growth. These analyst projections

[19] *Duff & Phelps 2016 Valuation Handbook* inflation rate of 2.9% at 2-4, and U.S. Bureau of Economic Analysis, January 29, 2016.

reflect all current outlooks for GDP and are likely the most influential on investors' expectations of future growth outlooks. The consensus economists' published GDP growth rate outlook is 4.25% over the next 10 years.[20]

Therefore, I propose to use the consensus economists' projected 5- and 10-year average GDP consensus growth rates of 4.25%, as published by *Blue Chip Financial Forecasts*, as an estimate of long-term sustainable growth. *Blue Chip Financial Forecasts* projections provide real GDP growth projections of 2.2% and GDP inflation of 2.0%[21] over the 5-year and 10-year projection periods. These consensus GDP growth forecasts represent the most likely views of market participants because they are based on published consensus economist projections.

Q DO YOU CONSIDER OTHER SOURCES OF PROJECTED LONG-TERM GDP GROWTH?

A Yes, and these sources corroborate my consensus analysts' projections, as shown below in Table 6.

[20] *Blue Chip Financial Forecasts, December 1, 2016, at 14*.
[21] *Id.*

TABLE 6

GDP Forecasts

Source	Term	Real GDP	Inflation	Nominal GDP
Blue Chip Financial Forecasts	5-10 Yrs	2.2%	2.0%	4.25%
EIA – Annual Earnings Outlook	25 Yrs	2.2%	2.1%	4.4%
Congressional Budget Office	10 Yrs	2.0%	2.0%	4.0%
Moody's Analytics	30 Yrs	2.0%	2.0%	4.1%
Social Security Administration	50 Yrs			4.4%
The Economist Intelligence Unit	35 Yrs	1.9%	2.0%	3.9%

The EIA in its *Annual Energy Outlook* projects real GDP out until 2040. In its 2016 Annual Report, the EIA projects real GDP through 2040 to be 2.2% and a long-term GDP price inflation projection of 2.1%. The EIA data supports a long-term nominal GDP growth outlook of 4.4%.[22]

Also, the Congressional Budget Office ("CBO") makes long-term economic projections. The CBO is projecting real GDP growth to be 2.0% during the next 10 years with a GDP price inflation outlook of 2.0%.[23] The CBO 10-year outlook for nominal GDP based on this projection is 4.0%.

Moody's Analytics also makes long-term economic projections. In its recent 30-year outlook to 2045, Moody's Analytics is projecting real GDP growth of 2.0% with GDP inflation of 2.0%.[24] Based on these projections, Moody's is projecting nominal GDP growth of 4.1% over the next 30 years.

[22]DOE/EIA Annual Energy Outlook 2016 With Projections to 2040, May 2016, Table 20.
[23]*CBO: The Budget and Economic Outlook: 2016 to 2026*, January 2016, at 140.
[24]www.economy.com, *Moody's Analytics Forecast*, January 6, 2016.

The Social Security Administration ("SSA") makes long-term economic projections out to 2090. The SSA's nominal GDP projection, under its intermediate cost scenario of 50 years, is 4.4%.[25] The Economist Intelligence Unit, a division of *The Economist* and a third-party data provider to SNL Financial, makes a long-term economic projection out to 2050.[26] The Economist Intelligence Unit is projecting real GDP growth of 1.9% with an inflation rate of 2.0% out to 2050. The real GDP growth projection is in line with the consensus economists. The long-term nominal GDP projection based on these outlooks is approximately 3.9%.

The real GDP and nominal GDP growth projections made by these independent sources support the use of the consensus economist 5-year and 10-year projected GDP growth outlooks as a reasonable estimate of market participants' long-term GDP growth outlooks.

Q WHAT STOCK PRICE, DIVIDEND, AND GROWTH RATES DID YOU USE IN YOUR MULTI-STAGE GROWTH DCF ANALYSIS?

A I relied on the same 13-week average stock prices and the most recent quarterly dividend payment data discussed above. For stage one growth, I used the consensus analysts' growth rate projections discussed above in my constant growth DCF model. The first stage growth covers the first five years, consistent with the term of the analyst growth rate projections. The second stage, or transition stage, begins in year 6 and extends through year 10. The second stage growth transitions the growth rate from the first stage to the third stage using a linear trend. For the third stage, or

[25] www.ssa.gov, "2016 OASDI Trustees Report," Table VI.G4.
[26] *SNL Financial, Economist Intelligence Unit*, downloaded on January 13, 2016.

long-term sustainable growth stage, starting in year 11, I used a 4.25% long-term sustainable growth rate based on the consensus economists' long-term projected nominal GDP growth rate.

Q WHAT ARE THE RESULTS OF YOUR MULTI-STAGE GROWTH DCF MODEL?

A As shown in Exhibit CCW-10, the average and median DCF returns on equity for my proxy group using the 13-week average stock price are 8.25% and 8.11%, respectively.

Q PLEASE SUMMARIZE THE RESULTS FROM YOUR DCF ANALYSES.

A The results from my DCF analyses are summarized in Table 7 below:

TABLE 7

Summary of DCF Results

Description	Proxy Group Average	Proxy Group Median
Constant Growth DCF Model (Analysts' Growth)	9.20%	9.10%
Constant Growth DCF Model (Sustainable Growth)	8.53%	8.24%
Multi-Stage Growth DCF Model	8.25%	8.11%

I conclude that my DCF studies support a return on equity of 9.10%, primarily based on my median constant growth DCF (analysts' growth) result, which I find as a reasonable high-end DCF return estimate.

IV.E. Risk Premium Model

Q PLEASE DESCRIBE YOUR BOND YIELD PLUS RISK PREMIUM MODEL.

A This model is based on the principle investors require a higher return to assume greater risk. Common equity investments have greater risk than bonds because bonds have more security of payment in bankruptcy proceedings than common equity and the coupon payments on bonds represent contractual obligations. In contrast, companies are not required to pay dividends or guarantee returns on common equity investments. Therefore, common equity securities are considered to be riskier than bond securities.

This risk premium model is based on two estimates of an equity risk premium. First, I estimated the difference between the required return on utility common equity investments and U.S. Treasury bonds. The difference between the required return on common equity and the Treasury bond yield is the risk premium. I estimated the risk premium on an annual basis for each year over the period January 1986 through 2016. The common equity required returns were based on regulatory commission-authorized returns for electric utility companies. Authorized returns are typically based on expert witnesses' estimates of the contemporary investor-required return.

The second equity risk premium estimate is based on the difference between regulatory commission-authorized returns on common equity and contemporary "A" rated utility bond yields by Moody's. I selected the period January 1986 through 2016 because public utility stocks consistently traded at a premium to book value during that period. This is illustrated in Exhibit CCW-11, which shows the market-to-book ratio since 1986 for the electric utility industry was consistently above a multiple

of 1.0x. Over this period, regulatory authorized returns were sufficient to support market prices that at least exceeded book value. This is an indication that regulatory authorized returns on common equity supported a utility's ability to issue additional common stock without diluting existing shares. It further demonstrates utilities were able to access equity markets without a detrimental impact on current shareholders.

Based on this analysis, as shown in Exhibit CCW-12, the average indicated equity risk premium over U.S. Treasury bond yields has been 5.47%. Since the risk premium can vary depending upon market conditions and changing investor risk perceptions, I believe using an estimated range of risk premiums provides the best method to measure the current return on common equity for a risk premium methodology.

I incorporated five-year and 10-year rolling average risk premiums over the study period to gauge the variability over time of risk premiums. These rolling average risk premiums mitigate the impact of anomalous market conditions and skewed risk premiums over an entire business cycle. As shown on my Exhibit CCW-12, the five-year rolling average risk premium over Treasury bonds ranged from 4.25% to 6.72%, while the 10-year rolling average risk premium ranged from 4.38% to 6.40%.

As shown on my Exhibit CCW-13, the average indicated equity risk premium over contemporary Moody's utility bond yields was 4.09%. The five-year and 10-year rolling average risk premiums ranged from 2.88% to 5.57% and 3.20% to 5.04%, respectively.

Q DO YOU BELIEVE THAT THE TIME PERIOD USED TO DERIVE THESE EQUITY RISK PREMIUM ESTIMATES IS APPROPRIATE TO FORM ACCURATE CONCLUSIONS ABOUT CONTEMPORARY MARKET CONDITIONS?

A Yes. The time period I use in this risk premium study is a generally accepted period to develop a risk premium study using "expectational" data.

Contemporary market conditions can change dramatically during the period that rates determined in this proceeding will be in effect. A relatively long period of time where stock valuations reflect premiums to book value is an indication the authorized returns on equity and the corresponding equity risk premiums were supportive of investors' return expectations and provided utilities access to the equity markets under reasonable terms and conditions. Further, this time period is long enough to smooth abnormal market movement that might distort equity risk premiums. While market conditions and risk premiums do vary over time, this historical time period is a reasonable period to estimate contemporary risk premiums.

Alternatively, some studies, such as Duff & Phelps referred to later in this testimony, have recommended that use of "actual achieved investment return data" in a risk premium study should be based on long historical time periods. The studies find that achieved returns over short time periods may not reflect investors' expected returns due to unexpected and abnormal stock price performance. Short-term, abnormal actual returns would be smoothed over time and the achieved actual investment returns over long time periods would approximate investors' expected

returns. Therefore, it is reasonable to assume that averages of annual achieved returns over long time periods will generally converge on the investors' expected returns.

My risk premium study is based on expectational data, not actual investment returns, and, thus, need not encompass a very long historical time period.

Q BASED ON HISTORICAL DATA, WHAT RISK PREMIUM HAVE YOU USED TO ESTIMATE LG&E'S COST OF COMMON EQUITY IN THIS PROCEEDING?

A The equity risk premium should reflect the relative market perception of risk in the utility industry today. I have gauged investor perceptions in utility risk today in Exhibit CCW-14, where I show the yield spread between utility bonds and Treasury bonds over the last 37 years. As shown on this exhibit, the average utility bond yield spreads over Treasury bonds for "A" and "Baa" rated utility bonds for this historical period are 1.52% and 1.96%, respectively. The utility bond yield spreads over Treasury bonds for "A" and "Baa" rated utilities for 2016 were 1.33% and 2.08%, respectively. The current average "A" rated utility bond yield spread over Treasury bond yields is now lower than the 37-year average spread. The current "Baa" rated utility bond yield spread over Treasury bond yields is higher than the 37-year average spread.

A current 13-week average "A" rated utility bond yield of 4.21% when compared to the current Treasury bond yield of 3.06% as shown in Exhibit CCW-15, page 1, implies a yield spread of around 115 basis points. This current utility bond yield spread is lower than the 37-year average spread for "A" rated utility bonds of

1.52%. The current spread for the "Baa" rated utility bond yield of 1.66% is also lower than the 37-year average spread of 1.96%. Further, when compared to the projected Treasury bond yield of 3.70%, the current "Baa" utility spread is around 1.02%, lower than the 37-year average of 1.96%.

These utility bond yield spreads are evidence that the market perception of utility risk is about average relative to this historical time period and demonstrate that utilities continue to have strong access to capital in the current market.

Q HOW DO YOU DETERMINE WHERE A REASONABLE RISK PREMIUM IS IN THE CURRENT MARKET?

A I observed the spread of Treasury securities relative to public utility bonds and corporate bonds in gauging whether or not the risk premium in current market prices is relatively stable relative to the past. What this observation of market evidence clearly provides is that the valuations in the current market place an above average risk premium on securities that have greater risk.

This market evidence is summarized below in Table 8, which shows the utility bond yield spreads over Treasury bond yields on average for the period 1980 through 2016. I also show the corporate bond yield spreads for Aaa corporates and Baa corporates.

TABLE 8

Comparison of Yield Spreads Over Treasury Bonds

	Utility		Corporate	
Description	**A**	**Baa**	**Aaa**	**Baa**
Average Historical Spread	1.52%	1.96%	0.84%	1.94%
2016 Spread	1.33%	2.08%	1.07%	2.12%

Source: Exhibit CCW-14.

The observable yield spreads shown in the table above illustrate that securities of greater risk have above average risk premiums relative to the long-term historical average risk premium. Specifically, A-rated utility bonds to Treasuries, a relatively low-risk investment, have a yield spread in 2016 that has been very comparable to that of its long-term historical yield spread. The A utility bond yield spread is actually below the yield spread over the last 37 years. This is an indication that low risk investments like Aaa corporate bond yield and A-rated utility bond yield have premium values relative to minimal risk Treasury securities.

In contrast, the higher risk Baa utility and corporate bond yields currently have an above-average yield spread of approximately 10 basis points (2.08% vs. 1.96%). The higher risk Baa utility bond yields do not have the same premium valuations as their lower risk A-rated utility bond yields, and thus the yield spread for greater risk investments is wider than lower risk investments.

This illustrates that securities with greater risk such as Baa yields versus A yields are commanding above average risk premiums in the current marketplace. Utility

equity securities are greater risk than Baa utility bonds. Because greater risk securities appear to support an above-average risk premium relative to historical averages, this would support an above-average risk premium in measuring a fair return on equity for a utility or equity security.

Q WHAT IS YOUR RECOMMENDED RETURN FOR LG&E BASED ON YOUR RISK PREMIUM STUDY?

A To be conservative, I am recommending more weight to the high-end risk premium estimates than the low-end. I state this because of the relatively low level of interest rates now but relative upward movements of utility yields more recently. Hence, I propose to provide 75% weight to my high-end risk premium estimates and 25% to the low-end. Applying these weights, the risk premium for Treasury bond yields would be approximately 6.10%,[27] which is considerably higher than the 31-year average risk premium of 5.47% and reasonably reflective of the 3.7% projected Treasury bond yield. A Treasury bond risk premium of 6.1% and projected Treasury bond yield of 3.7% produce a risk premium estimate of 9.8%. Similarly, applying these weights to the utility risk premium indicates a risk premium of 4.9%.[28] This risk premium is above the 31-year historical average risk premium of 4.09%. This risk premium in connection with the current Baa observable utility bond yield of 4.72% produces an estimated return on equity of approximately 9.62% (4.90% + 4.72%).

[27](4.25% * 25%) + (6.72% * 75%) = 6.10%.
[28](2.88% * 25%) + (5.57% * 75%) = 4.90%.

Based on this methodology, my Treasury bond risk premium and my utility bond risk premium indicate a return on equity in the range of 9.6% to 9.8% with a midpoint of 9.70%.

IV.F. Capital Asset Pricing Model ("CAPM")

Q PLEASE DESCRIBE THE CAPM.

A The CAPM method of analysis is based upon the theory that the market-required rate of return for a security is equal to the risk-free rate, plus a risk premium associated with the specific security. This relationship between risk and return can be expressed mathematically as follows:

$R_i = R_f + B_i \times (R_m - R_f)$ where:

R_i = Required return for stock i
R_f = Risk-free rate
R_m = Expected return for the market portfolio
B_i = Beta - Measure of the risk for stock

The stock-specific risk term in the above equation is beta. Beta represents the investment risk that cannot be diversified away when the security is held in a diversified portfolio. When stocks are held in a diversified portfolio, firm-specific risks can be eliminated by balancing the portfolio with securities that react in the opposite direction to firm-specific risk factors (e.g., business cycle, competition, product mix, and production limitations).

The risks that cannot be eliminated when held in a diversified portfolio are non-diversifiable risks. Non-diversifiable risks are related to the market in general and referred to as systematic risks. Risks that can be eliminated by diversification are non-systematic risks. In a broad sense, systematic risks are market risks and non-

systematic risks are business risks. The CAPM theory suggests the market will not compensate investors for assuming risks that can be diversified away. Therefore, the only risk investors will be compensated for are systematic or non-diversifiable risks. The beta is a measure of the systematic or non-diversifiable risks.

Q PLEASE DESCRIBE THE INPUTS TO YOUR CAPM.

A The CAPM requires an estimate of the market risk-free rate, the Company's beta, and the market risk premium.

Q WHAT DID YOU USE AS AN ESTIMATE OF THE MARKET RISK-FREE RATE?

A As previously noted, *Blue Chip Financial Forecasts*' projected 30-year Treasury bond yield is 3.70%.[29] The current 30-year Treasury bond yield is 3.06%, as shown in Exhibit CCW-15. I used *Blue Chip Financial Forecasts*' projected 30-year Treasury bond yield of 3.70% for my CAPM analysis.

Q WHY DID YOU USE LONG-TERM TREASURY BOND YIELDS AS AN ESTIMATE OF THE RISK-FREE RATE?

A Treasury securities are backed by the full faith and credit of the United States government so long-term Treasury bonds are considered to have negligible credit risk. Also, long-term Treasury bonds have an investment horizon similar to that of common stock. As a result, investor-anticipated long-run inflation expectations are reflected in

[29] *Blue Chip Financial Forecasts*, February 1, 2016 at 2.

both common stock required returns and long-term bond yields. Therefore, the nominal risk-free rate (or expected inflation rate and real risk-free rate) included in a long-term bond yield is a reasonable estimate of the nominal risk-free rate included in common stock returns.

Treasury bond yields, however, do include risk premiums related to unanticipated future inflation and interest rates. A Treasury bond yield is not a risk-free rate. Risk premiums related to unanticipated inflation and interest rates are systematic of market risks. Consequently, for companies with betas less than 1.0, using the Treasury bond yield as a proxy for the risk-free rate in the CAPM analysis can produce an overstated estimate of the CAPM return.

Q WHAT BETA DID YOU USE IN YOUR ANALYSIS?

A As shown in Exhibit CCW-16, the proxy group average Value Line beta estimate is 0.69.

Q HOW DID YOU DERIVE YOUR MARKET RISK PREMIUM ESTIMATE?

A I derived two market risk premium estimates: a forward-looking estimate and one based on a long-term historical average.

The forward-looking estimate was derived by estimating the expected return on the market (as represented by the S&P 500) and subtracting the risk-free rate from this estimate. I estimated the expected return on the S&P 500 by adding an expected inflation rate to the long-term historical arithmetic average real return on the market. The real return on the market represents the achieved return above the rate of inflation.

Duff & Phelps' *2016 Valuation Handbook* estimates the historical arithmetic average real market return over the period 1926 to 2015 as 8.7%.[30] A current consensus analysts' inflation projection, as measured by the Consumer Price Index, is 2.3%.[31] Using these estimates, the expected market return is 11.20%.[32] The market risk premium then is the difference between the 11.20% expected market return and my 3.70% risk-free rate estimate, or approximately 7.50%.

My historical estimate of the market risk premium was also calculated by using data provided by Duff & Phelps in its *2016 Valuation Handbook*. Over the period 1926 through 2015, the Duff & Phelps study estimated that the arithmetic average of the achieved total return on the S&P 500 was 12.0%[33] and the total return on long-term Treasury bonds was 6.00%.[34] The indicated market risk premium is 6.0% (12.0% - 6.0% = 6.0%).

Q HOW DOES YOUR ESTIMATED MARKET RISK PREMIUM RANGE COMPARE TO THAT ESTIMATED BY DUFF & PHELPS?

A The Duff & Phelps analysis indicates a market risk premium falls somewhere in the range of 5.5% to 6.9%. My market risk premium falls in the range of 6.0% to 7.5%. My average market risk premium of 6.8% is at the high-end of the Duff & Phelps range.

[30] *Duff & Phelps, 2016 Valuation Handbook: Guide to Cost of Capital* at 2-4. Calculated as [(1+0.12) / (1+0.03)] – 1.
[31] *Blue Chip Financial Forecasts*, February 1, 2016 at 2.
[32] { [(1 + 0.087) ∗ (1 + 0.023)] – 1 } ∗ 100.
[33] *Duff & Phelps, 2016 Valuation Handbook: Guide to Cost of Capital* at 2-4.
[34] *Id.*

Q HOW DOES DUFF & PHELPS MEASURE A MARKET RISK PREMIUM?

A Duff & Phelps makes several estimates of a forward-looking market risk premium based on actual achieved data from the historical period of 1926 through 2015 as well as normalized data. Using this data, Duff & Phelps estimates a market risk premium derived from the total return on large company stocks (S&P 500), less the income return on Treasury bonds. The total return includes capital appreciation, dividend or coupon reinvestment returns, and annual yields received from coupons and/or dividend payments. The income return, in contrast, only reflects the income return received from dividend payments or coupon yields. Duff & Phelps claims the income return is the only true risk-free rate associated with Treasury bonds and is the best approximation of a truly risk-free rate.[35] I disagree with this assessment from Duff & Phelps because it does not reflect a true investment option available to the marketplace and therefore does not produce a legitimate estimate of the expected premium of investing in the stock market versus that of Treasury bonds. Nevertheless, I will use Duff & Phelps' conclusion to show the reasonableness of my market risk premium estimates.

Duff & Phelps' range is based on several methodologies. First, Duff & Phelps estimates a market risk premium of 6.9% based on the difference between the total market return on common stocks (S&P 500) less the income return on Treasury bond investments over the 1926-2015 period.

Second, Duff & Phelps updated the Ibbotson & Chen supply-side model which found that the 6.9% market risk premium based on the S&P 500 was influenced by an

[35] *Id.* at 3-28.

abnormal expansion of price-to-earnings ("P/E") ratios relative to earnings and dividend growth during the period, primarily over the last 25 years. Duff & Phelps believes this abnormal P/E expansion is not sustainable.[36] Therefore, Duff & Phelps adjusted this market risk premium estimate to normalize the growth in the P/E ratio to be more in line with the growth in dividends and earnings. Based on this alternative methodology, Duff & Phelps published a long-horizon supply-side market risk premium of 6.03%.[37]

Finally, Duff & Phelps developed its own recommended equity, or market, risk premium by employing an analysis that considered a wide range of economic information, multiple risk premium estimation methodologies, and the current state of the economy by observing measures such as the level of stock indices and corporate spreads as indicators of perceived risk. Based on this methodology, and utilizing a "normalized" risk-free rate of 4.0%, Duff & Phelps concluded that the current expected, or forward-looking, market risk premium is 5.5%, implying an expected return on the market of 9.5%.[38]

Q WHAT ARE THE RESULTS OF YOUR CAPM ANALYSIS?

A As shown in Exhibit CCW-17, based on my low market risk premium of 6.0% and my high market risk premium of 7.5%, a risk-free rate of 3.70%, and a beta of 0.69, my CAPM analysis produces a return of 7.81% to 8.84%. Based on my assessment of risk premiums in the current market, as discussed above, I recommend my high-end

[36] *Id.* at 3-30.
[37] *Id.* at 3-31.
[38] *Id.* at 3-40.

CAPM return estimate of 8.84%, rounded to 8.80%. This CAPM most closely aligns the market risk premium with the current risk-free rate.

IV.G. Return on Equity Summary

Q BASED ON THE RESULTS OF YOUR RETURN ON COMMON EQUITY ANALYSES DESCRIBED ABOVE, WHAT RETURN ON COMMON EQUITY DO YOU RECOMMEND FOR LG&E?

A Based on my analyses, I estimate LG&E's current market cost of equity to be 9.35%.

TABLE 9

Return on Common Equity Summary

Description	Results
DCF	9.10%
Risk Premium	9.70%
CAPM	8.80%

My recommended return on common equity of 9.35% is at the midpoint of my estimated range of 9.00% to 9.70%. As shown in Table 9 above, the high-end of my estimated range is based on my risk premium studies. The low-end is based on my CAPM return and DCF results.

My return on equity estimates reflect observable market evidence, the impact on Federal Reserve policies on current and expected long-term capital market costs, an assessment of the current risk premium built into current market securities, and a

general assessment of the current investment risk characteristics of the electric utility industry, and the market's demand for utility securities.

IV.H. Financial Integrity

Q WILL YOUR RECOMMENDED OVERALL RATE OF RETURN SUPPORT AN INVESTMENT GRADE BOND RATING FOR LG&E?

A Yes. I have reached this conclusion by comparing the key credit rating financial ratios for LG&E at my proposed return on equity and the Company's actual test-year-end capital structure to S&P's benchmark financial ratios using S&P's new credit metric ranges.

Q PLEASE DESCRIBE THE MOST RECENT S&P FINANCIAL RATIO CREDIT METRIC METHODOLOGY.

A S&P publishes a matrix of financial ratios corresponding to its assessment of the business risk of utility companies and related bond ratings. On May 27, 2009, S&P expanded its matrix criteria by including additional business and financial risk categories.[39]

Based on S&P's most recent credit matrix, the business risk profile categories are "Excellent," "Strong," "Satisfactory," "Fair," "Weak," and "Vulnerable." Most utilities have a business risk profile of "Excellent" or "Strong."

[39]S&P updated its 2008 credit metric guidelines in 2009, and incorporated utility metric benchmarks with the general corporate rating metrics. *Standard & Poor's RatingsDirect*: "Criteria Methodology: Business Risk/Financial Risk Matrix Expanded," May 27, 2009.

The financial risk profile categories are "Minimal," "Modest," "Intermediate," "Significant," "Aggressive," and "Highly Leveraged." Most of the utilities have a financial risk profile of "Aggressive." LG&E has an "Excellent" business risk profile and a "Significant" financial risk profile.

Q PLEASE DESCRIBE S&P'S USE OF THE FINANCIAL BENCHMARK RATIOS IN ITS CREDIT RATING REVIEW.

A S&P evaluates a utility's credit rating based on an assessment of its financial and business risks. A combination of financial and business risks equates to the overall assessment of LG&E's total credit risk exposure. On November 19, 2013, S&P updated its methodology. In its update, S&P published a matrix of financial ratios that defines the level of financial risk as a function of the level of business risk.

S&P publishes ranges for primary financial ratios that it uses as guidance in its credit review for utility companies. The two core financial ratio benchmarks it relies on in its credit rating process include: (1) Debt to Earnings Before Interest, Taxes, Depreciation and Amortization ("EBITDA"); and (2) Funds From Operations ("FFO") to Total Debt.[40]

[40] *Standard & Poor's RatingsDirect*: "Criteria: Corporate Methodology," November 19, 2013.

Q HOW DID YOU APPLY S&P'S FINANCIAL RATIOS TO TEST THE REASONABLENESS OF YOUR RATE OF RETURN RECOMMENDATIONS?

A I calculated each of S&P's financial ratios based on LG&E's cost of service for its retail jurisdictional operations. While S&P would normally look at total consolidated LG&E financial ratios in its credit review process, my investigation in this proceeding is not the same as S&P's. I am attempting to judge the reasonableness of my proposed cost of capital for rate-setting in LG&E's retail regulated utility operations. Hence, I am attempting to determine whether my proposed rate of return will in turn support cash flow metrics, balance sheet strength, and earnings that will support an investment grade bond rating and LG&E's financial integrity.

Q DID YOU INCLUDE ANY OFF-BALANCE SHEET DEBT EQUIVALENTS?

A Yes, I did. The off-balance sheet debt equivalents and their associated amortization and interest expense were obtained from the S&P Capital IQ website for 2015 and used in my analysis presented on my Exhibit CCW-18.

Q PLEASE DESCRIBE THE RESULTS OF THIS CREDIT METRIC ANALYSIS AS IT RELATES TO LG&E.

A The S&P financial metric calculations for LG&E at a 9.35% return are developed on Exhibit CCW-18. The credit metrics produced below, with LG&E's financial risk profile from S&P of "Intermediate" and business risk score by S&P of "Excellent,"

will be used to assess the strength of the credit metrics based on LG&E's retail operations in Kentucky.

LG&E's adjusted total debt ratio is approximately 48.0% from my Exhibit CCW-18, page 3. This adjusted debt ratio as discussed above, is generally consistent with the utility industry average adjusted debt ratio with an 'A' bond rating, comparable to that of the proxy group, and reasonably consistent with an A- bond rating which is consistent with LG&E's current bond rating. Hence, I concluded this capital structure reasonably supports LG&E's current investment grade bond rating.

Based on an equity return of 9.35%, LG&E will be provided an opportunity to produce a debt to Earnings Before Interest, Taxes, Depreciation and Amortization ("EBITDA") ratio of 3.1x. This is within S&P's "Intermediate" guideline range of 2.5x to 3.5x."[41] This ratio supports an investment grade credit rating.

LG&E's retail operations FFO to total debt coverage at a 9.35% equity return is 29%, which is within S&P's "Significant" metric guideline range of 13% to 22%. This FFO/total debt ratio will support an investment grade bond rating.

At my recommended return on equity of 9.35% and the Company's proposed capital structure and embedded debt cost, LG&E's financial credit metrics continue to support credit metrics at an investment grade utility level.

[41] *Id.*

V. RESPONSE TO LG&E WITNESS MR. ADRIEN MCKENZIE

V.A. Summary of Response

Q WHAT IS LG&E'S RETURN ON EQUITY RECOMMENDATION?

A Mr. McKenzie recommends a return on equity of 10.23%, which is the midpoint of his recommended range of 9.63% to 10.83%.[42] His recommendation includes an adjustment of 13 basis points to account for flotation costs (McKenzie Direct Testimony at 5).

Mr. McKenzie's recommended range, and his proposed flotation cost adjustment, are unreasonable and should be rejected. For the reasons discussed below, his 13 basis point flotation cost adjustment further exacerbates an already overstated "bare bones" fair return on equity for LG&E.

V.B. Flotation Cost Adjustment

Q DID MR. MCKENZIE INCLUDE A FLOTATION COST ADJUSTMENT IN HIS RECOMMENDED RETURN FOR LG&E?

A Yes. Mr. McKenzie included an upward adjustment of 13 basis points to compensate for flotation costs to his return on equity recommendation.[43] He acknowledges there is no standard method for reflecting flotation costs in return on equity methodology,[44] so he proposes a methodology advocated in certain regulatory finance books and that used by Morgan Stanley. In effect, he grows his proxy group's average dividend yield of 3.7% by a historical average flotation cost of 3.6% observed by Morgan Stanley.

[42] McKenzie Direct Testimony at 5.
[43] *Id.* at 55-59.
[44] *Id*. at 55.

Applying this percentage expense to a dividend yield of 3.7%, produces a flotation cost adjustment of 13 basis points.[45] This flotation cost adjustment is intended to recover the actual cost a utility incurs by issuing additional stock to the public.

Q IS MR. MCKENZIE'S FLOTATION COST RETURN ON EQUITY ADDER REASONABLE?

A No. Mr. McKenzie's flotation cost return on equity adder is not reasonable or justified for several reasons. First, the adder is not based on the recovery of prudent and verifiable actual flotation costs incurred by LG&E. As discussed at pages 58-59 of Mr. McKenzie's direct testimony, he derives a flotation cost adder based on generic cost information of other utility companies. Because he does not show that his adjustment is based on LG&E's actual and verifiable flotation expenses, there are no means of verifying whether Mr. McKenzie's proposal is reasonable or appropriate. Stated differently, Mr. McKenzie's flotation cost return on equity adder is not based on known and measurable LG&E costs. Therefore, the Commission should reject a flotation cost return on equity adder for LG&E.

V.C. Return on Equity

Q HOW DID MR. MCKENZIE DEVELOP HIS RETURN ON EQUITY RANGE?

A Mr. McKenzie developed his return on equity recommendation by applying the DCF, the traditional CAPM, the Empirical CAPM ("ECAPM"), a Risk Premium model, and

[45] *Id.* at 59.

an Expected Earnings analysis to his utility proxy group. Then he corroborates his results by developing a non-utility DCF model.

As shown below in Table 10, Mr. McKenzie concludes that a "bare-bones" return on equity in the range of 9.5% to 10.7%, with a midpoint of 10.1%. Then, Mr. McKenzie adds his flotation cost adjustment of 13 basis points to produce his recommended range of 9.63% to 10.83% and return on equity of 10.23%. However, reasonable adjustments to Mr. McKenzie's DCF, CAPM, ECAPM, and Risk Premium studies reduce his return on equity estimate for LG&E to no higher than my recommended return on equity of 9.25%.

TABLE 10

Mr. McKenzie's ROE Analysis

Model	Average (1)	Adjusted (2)
DCF	8.4% - 9.5%	8.2% - 9.2%
Midpoint	9.0%	8.7%
CAPM (Current)		
Unadjusted	8.6%	8.6%
Size Adjusted	9.2%	Reject
CAPM (Projected)		
Unadjusted	9.0%	9.0%
Size Adjusted	9.6%	Reject
ECAPM (Current)		
Unadjusted	9.3%	8.1%
Size Adjusted	9.8%	Reject
ECAPM (Projected)		
Unadjusted	9.6%	8.6%
Size Adjusted	10.1%	Reject
Risk Premium		
Current	10.0%	8.0%
Projected	11.1%	9.3%
Expected Earnings	11.3%	Reject
Non-Utility DCF	10.0% - 10.2%	Reject
Range	**9.5% - 10.7%**	**8.0% - 9.6%**
Flotation Cost Adjustment	0.13%	Reject
Adjusted Range	**9.63% - 10.83%**	**8.0% - 9.6%**
Recommended ROE	**10.23%**	**9.35%**

Source: Exhibit No. 2.

Q PLEASE DESCRIBE MR. MCKENZIE'S DCF ANALYSIS.

A Mr. McKenzie applied the traditional DCF model to his utility proxy group. Based on his utility proxy group, the DCF results average in the range of 8.4% to 9.5% with a midpoint of 9.0%.

In developing his recommended DCF range, Mr. McKenzie excluded what he found to be outlier results. Mr. McKenzie removed 11 low-end outliers and only one high-end outlier from his DCF results.[46]

Q CAN MR. MCKENZIE'S DCF ANALYSIS BE ADJUSTED TO PRODUCE MORE REASONABLE RESULTS?

A Yes. Mr. McKenzie's proposal to selectively remove what he believes to be low-end and high-end outliers from the proxy group has the effect of manipulating the results of the proxy group study. Mr. McKenzie simply narrows the range of the proxy group results to produce a result which he finds to be reasonable. This is hardly an independent assessment of what the current market cost of equity is for LG&E.

A better methodology would be to rely on the results of the proxy group, by assessing the central tendency of the proxy group results. In the presence of outliers, a more accurate method of measuring the central tendency of the proxy group's results would be to measure the median of all the DCF return estimates. In doing so, this would lower Mr. McKenzie's DCF range of 8.4% to 9.5% down to 8.2% to 9.2% for his utility proxy group. Therefore, the midpoint of all his DCF return estimates will result in a return on equity of 8.7%.

[46]Exhibit No. 5, page 3.

Q PLEASE DESCRIBE MR. MCKENZIE'S CURRENT AND PROJECTED TRADITIONAL CAPM ANALYSES.

A Mr. McKenzie developed a traditional CAPM analysis based on current and projected Treasury bond yields. Mr. McKenzie estimates a market return of 11.3%. From this market return estimate he subtracts his current and projected risk-free rates of 2.4% and 3.9%, to arrive at current and projected market risk premiums of 8.9% and 7.4%, respectively. (Exhibit No. 7).

He relies on the *Value Line* utility betas for the companies included in his proxy group to produce an average cost of equity of 8.6% to 9.0%.[47]

Then he adds a size adjustment to his CAPM return estimate of approximately 0.60% to arrive at his cost of equity for the proxy group of 9.2% to 9.6%.

Q ARE MR. MCKENZIE'S CURRENT AND PROJECTED CAPM ANALYSES REASONABLE?

A No. My major issue with Mr. McKenzie's CAPM analyses is his size adjustment. While I disagree with the derivation of his market risk premium of 7.4% to 8.9% because it is based on a market return of 11.3% consisting of an excessive growth rate projection of 8.8% and a dividend yield of 2.5%, to limit the issues with Mr. McKenzie's testimony, I will focus my rebuttal on the size adjustment.

[47]Exhibit No. 7.

Q WHY DO YOU FIND MR. MCKENZIE'S SIZE ADJUSTMENT INAPPROPRIATE?

A Mr. McKenzie's size adjustment return on equity adder is based on estimates made by Duff & Phelps's *2016 Valuation Handbook – Guide to Cost of Capital*. Duff & Phelps estimates various size adjustments based on differentials in beta estimates tied to the size of a company. There are two problems with this size adjustment. First, the size adjustment, as applied by Mr. McKenzie, is not risk comparable for LG&E. Second, Mr. McKenzie did not fully apply the buildup methodology described in the *Valuation Handbook*.

Duff & Phelps *Valuation Handbook*, includes many external adjustments including: (1) a size adjustment as recognized by Mr. McKenzie, and (2) also an industry risk premium adjustment to reflect the unique risk characteristics of the industry the company operates in. Mr. McKenzie ignored the industry risk premium factor recommended by Duff & Phelps in its CAPM build-up methodology. Rather than recognizing all relevant adjustments provided in the *Valuation Handbook*, Mr. McKenzie cherry-picked the size adjustment to increase the results of his CAPM return estimates.

Q WHY IS MR. MCKENZIE'S SIZE ADJUSTMENT TO HIS CAPM RETURN NOT RISK COMPARABLE TO LG&E?

A His size adjustment reflects risks that are not reflective of LG&E. The size adjustment recommended by Mr. McKenzie reflects companies that have beta estimates in excess

of 1.00.[48] These beta estimates are substantially higher than the average beta of 0.70 for the utility proxy group used by Mr. McKenzie as reflective of LG&E's investment risk. Because of this disparity in beta, Mr. McKenzie's size adjustment produces a CAPM return estimate that does not produce a risk appropriate return for LG&E and therefore, is not a reasonable and fair return for LG&E.

Q CAN YOU EXPLAIN HOW BETA CORRESPONDS WITH THE LEVEL OF INVESTMENT RISK FOR A COMPANY AND THEREFORE PRODUCES AN APPROPRIATE RISK-ADJUSTED RETURN FOR A SUBJECT COMPANY?

A Yes. Beta represents a measure of systematic or non-diversifiable risk. All subject companies' betas are measured relative to that of the overall market. The market beta is considered to be 1.0. For companies that have betas greater than 1, they are regarded as having more risk than the overall market. For companies that have betas less than 1, they are regarded to have risk less than the overall market.

For these reasons, utility companies which consistently and predictably have adjusted betas far less than 1 (usually in the range of 0.6 to 0.8 depending on market conditions) are generally reflective as lower risk investment options.

[48] *Duff & Phelps 2016 Valuation Handbook* at 7-11, Exhibit 7.3.

Q PLEASE DESCRIBE WHY MR. MCKENZIE'S PROPOSED SIZE ADJUSTMENT IS AN INCOMPLETE APPLICATION OF THE DUFF & PHELPS' PROPOSED CAPM BUILD-UP METHODOLOGY.

A Duff & Phelps' CAPM build-up methodology includes adjustments to the raw CAPM estimate for size, industry risk differentials, and other material risks. Mr. McKenzie selectively included only one CAPM risk adder – the size risk adder – to his CAPM return. However, Mr. McKenzie failed to reflect the reduced risk associated with being in the low-risk regulated utility industry, which results in a significant overstatement of a fair CAPM return estimate for LG&E.

Specifically, Mr. McKenzie estimates a size adjustment that is appropriate for LG&E of a CAPM return adder of approximately 0.60%. However, the regulated utility industry risk premium estimate calculated by Duff & Phelps would be a reduction to the CAPM and ECAPM return estimate of approximately 4.1%.[49] As such, a balanced application of Duff & Phelps' proposed CAPM build-up methodology would have a medium increase in the CAPM return estimate for a size adjustment, but a significant decrease in the CAPM return estimate to reflect the low-risk nature of the regulated utility industry. Mr. McKenzie's proposed size adjustment is imbalanced and inaccurate, without reflecting the return on equity reduction appropriate with low-risk regulated industries as proposed by Duff & Phelps.

[49] *Duff & Phelps 2016 Valuation Handbook* at Appendix 3a.

Q HOW WOULD MR. MCKENZIE'S CURRENT AND PROJECTED TRADITIONAL CAPM RETURN ESTIMATES CHANGE IF A COMPLETE BUILD-UP METHODOLOGY IS APPLIED?

A Reflecting a complete build-up methodology as recommended by Duff & Phelps on a basic CAPM return estimate, which includes Mr. McKenzie's risk-free rates, market risk premiums, a size adjustment and an industry risk premium, Mr. McKenzie's size-adjusted CAPM return estimates would decline from 9.2% and 9.6% to 7.8% for his utility proxy group.

TABLE 11

Buildup Return Estimates

Description	Current	Projected
Risk-Free Rate[1]	2.4%	3.9%
Equity RP[1]	8.9%	7.4%
Avg Size RP[1]	0.6%	0.6%
Industry RP[2]	(4.1%)	(4.1%)
	7.8%	7.8%

Sources:
[1]Exhibit No. 7.
[2]*Duff & Phelps 2016 Valuation Handbook* at Appendix 3a.

It should be noted that the market risk premium is not adjusted by beta in the completed build-up model because the industry risk premium is already adjusted by a full-information beta.

Q DID MR. MCKENZIE ALSO PERFORM AN ECAPM ANALYSIS?

A Yes. Mr. McKenzie performed an ECAPM analysis that relied on the same market risk premiums of 8.9% and 7.4%, the same current and projected risk-free rates of 2.4% and 3.9%, respectively, and the same average *Value Line* betas that he used in his current and projected CAPM analyses.

He then uses an ECAPM model that applies a 25% weighting factor to the market beta of 1, and a 75% weighting factor to the utility beta. This produces an ECAPM range of 9.3% to 9.6%.

Finally, Mr. McKenzie applied a size adjustment of approximately 0.50% to his ECAPM estimates. His size-adjusted range is 9.8% to 10.1%.[50]

Q ARE MR. MCKENZIE'S CURRENT AND PROJECTED ECAPM ANALYSES REASONABLE?

A No. Mr. McKenzie's ECAPM analyses share some of the same flaws as his traditional CAPM analyses. Mr. McKenzie's proposal to adjust the ECAPM result upward applying a size adjustment is inappropriate and should be rejected for the same reasons discussed in response to his traditional CAPM.

Q DO YOU HAVE ANY OTHER ISSUES WITH MR. MCKENZIE'S CURRENT AND PROJECTED ECAPM ANALYSES?

A Yes. Mr. McKenzie's ECAPM analysis is flawed because his model was developed using adjusted utility betas. An ECAPM analysis flattens the security market line, and

[50]Exhibit No. 8.

is designed for raw beta estimates, not adjusted betas such as the ones published by *Value Line*. Beta adjustments, on their own, accomplish virtually the same thing as an ECAPM analysis. They flatten the security market line, and increase the intercept at the risk-free rate. ECAPM analysis is not designed to be used with adjusted betas, but rather is designed to be used with unadjusted betas. Mr. McKenzie's proposal to use adjusted betas within an ECAPM analysis is unreasonable and double counts the attempt to flatten the security market line and increase CAPM return estimates for companies with betas below 1, and decrease CAPM return estimates for companies with betas greater than 1.

Q DO YOU HAVE ANY ADDITIONAL COMMENTS REGARDING THE ECAPM AND ADJUSTED BETAS?

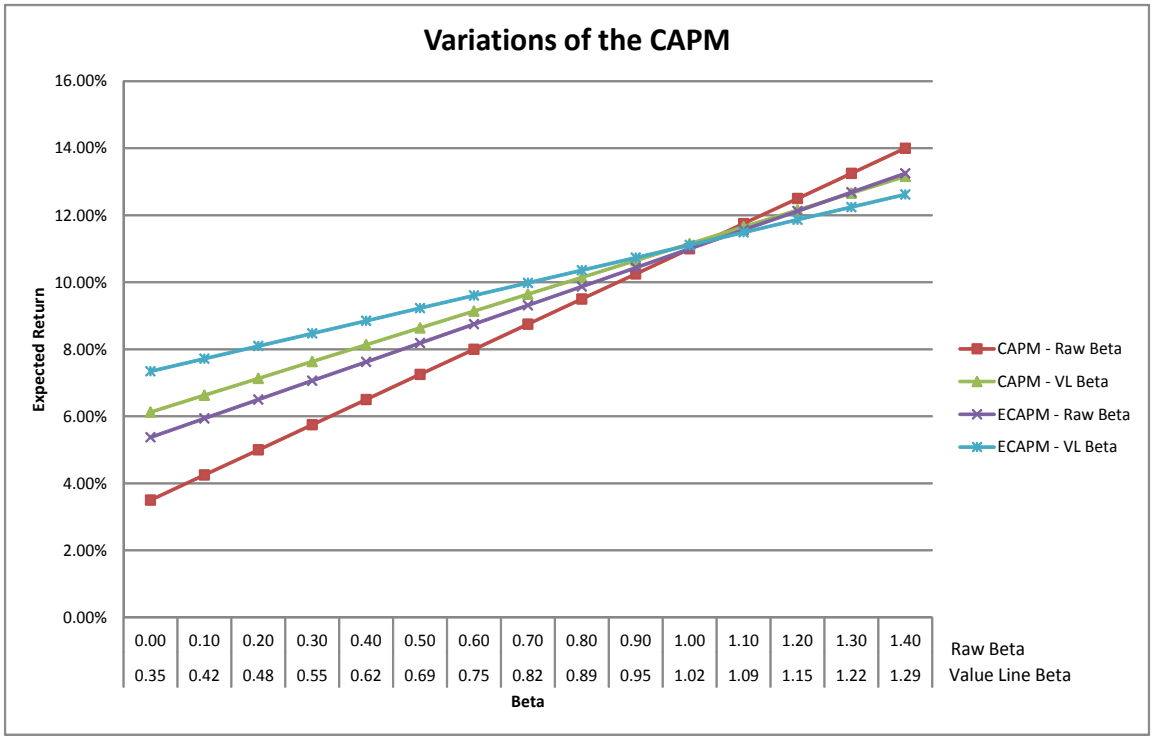
A Yes. The notion that an adjustment to beta is only a horizontal axis adjustment is not true. The *Value Line* beta adjustment alters the CAPM return at both the vertical axis (the intercept point) and the horizontal axis, the slope of the CAPM return line (along the horizontal axis). This is depicted in Figure 5 below.

As shown in Figure 5, I have modeled the expected returns at various levels of raw beta using both the traditional CAPM and ECAPM methodologies assuming a risk-free rate of 3.50%, and a market risk premium of 7.50%. I also show the expected CAPM and ECAPM returns using the associated adjusted (*Value Line*) beta estimates for each raw beta estimate. As shown in Figure 5 below, the impact on the traditional CAPM return using a raw beta and a traditional CAPM using an adjusted beta has the effect of increasing the intercept point at a zero raw beta (y axis) from: (1)

risk-free rate to (2) the combination of the risk-free rate plus 35% of the market risk premium. Further, as the unadjusted beta is increased above zero, the adjusted beta increases the CAPM return when the raw beta is less than one, and decreases the CAPM return when the raw beta is greater than one. In other words, the beta adjustment raises the CAPM return at the vertical axis point and flattens the security market across the horizontal axis as the raw beta increases above zero.

The ECAPM using raw betas has the same impact on the traditional CAPM using an adjusted beta: the ECAPM increases the CAPM return at a zero raw beta from: (1) the risk-free rate, to (2) the risk-free rate plus 25% of the market risk premium. Further, the ECAPM using raw betas flattens the traditional CAPM return line across the horizontal axis as the raw betas increase above zero.

Figure 5



Assumptions:
Market Risk Premium is 7.50%
Risk-Free Rate is 3.50%

As shown in the graph above, compared to the traditional CAPM using a raw beta, the traditional CAPM using an adjusted beta raises the intercept point (a y axis impact) and flattens the slope of the security market line (an x axis impact). Similarly, using a raw beta estimate, the ECAPM raises the intercept point at the y axis and flattens the CAPM return for all raw beta estimates.

Significantly, if an adjusted beta is used in an ECAPM return model, the CAPM return at the y axis increases from: (1) the risk-free rate, up to (2) the risk-free rate plus approximately 51% of the market risk premium. Further, the CAPM return for betas less than one starts at an inflated y axis intercept point and increases as the raw beta increases above zero.

Mathematically, *Value Line*'s beta adjustments produce nearly the same effect on the estimated CAPM return as does an ECAPM using a raw beta. Using an adjusted beta in an ECAPM model, as Mr. McKenzie has proposed, produces a flawed and inflated CAPM return estimate.

Q IS THERE ANY ACADEMIC SUPPORT FOR MR. MCKENZIE'S PROPOSED USE OF AN ADJUSTED BETA IN AN ECAPM STUDY?

A No. I am unaware of any peer reviewed academic study showing that the empirical CAPM is more accurate using adjusted betas. To my knowledge, the ECAPM has been tested and published with raw beta estimates. Further, Mr. McKenzie has not provided any academic research that was subjected to academic peer review which supports her proposed use of an adjusted beta in an ECAPM study. As such, the practice of using an adjusted beta in an ECAPM study is simply not supported by

academic research. There is, however, considerable academic support for the use of a raw beta in an ECAPM study. For the reasons outlined above, Mr. McKenzie's proposal to use adjusted betas in an ECAPM study should be rejected.

Q HOW WOULD MR. MCKENZIE'S CURRENT AND PROJECTED ECAPM RETURN ESTIMATES CHANGE IF THE CORRECT BETA WERE USED?

A The average Value Line adjusted beta is 0.70.[51] This would equate to an unadjusted beta estimate of 0.52.[52] Applying his market risk premium estimate of 8.9%, a raw beta of 0.52, and his current risk-free rate of 2.4% will produce an ECAPM return of 8.1%.[53] Similarly, applying Mr. McKenzie's market risk premium estimate of 7.4%, a raw beta of 0.52, and his projected risk-free rate of 3.9% will produce an ECAPM return of 8.6%.[54]

Also, as shown in Table 11 above, reflecting a complete build-up methodology as recommended by Duff & Phelps, which includes the risk-free rate, an equity risk premium, a size adjustment and an industry risk premium, Mr. McKenzie's size-adjusted ECAPM return estimates would decline from 9.8% and 10.1% down to 7.8% as discussed above.

[51]McKenzie Direct Testimony at 23.
[52](Adj. Beta – 0.35)/0.67 = Raw Beta. Hence, Raw Beta = (0.70 – 0.35)/0.67 = 0.52.
[53]Current ECAPM = 2.4% + 0.25 x 8.9% + 0.75 x 8.9% x 0.52 = 8.1%.
[54]Projected ECAPM = 3.9% + 0.25 x 7.4% + 0.75 x 7.4% x 0.52 = 8.6%.

Q PLEASE DESCRIBE MR. MCKENZIE'S UTILITY RISK PREMIUM ANALYSIS.

A Mr. McKenzie's utility bond yield versus authorized return on common equity risk premium is shown in his Exhibit No. 9. As shown on page 3 of this exhibit, Mr. McKenzie estimated an annual equity risk premium by subtracting Moody's utility bond yield from the electric utility regulatory commission authorized return on common equity over the period 1980 through 2015. Based on this analysis, Mr. McKenzie estimates an average indicated equity risk premium over utility bond yields of 3.62%.

Mr. McKenzie then adjusts this average equity risk premium using a regression analysis based on an expectation that there is an ongoing inverse relationship between interest rates and equity risk premiums. Using this regression analysis, Mr. McKenzie increases his equity risk premium from 3.62%, up to 5.58% and 4.75% relative to current and projected Baa-rated bond yields.[55] He then adds these inflated equity risk premiums to the current and projected Baa-rated utility bond yield of 4.41% to 6.34%, to produce a return on equity of 10.0% to 11.1%.[56]

Mr. McKenzie's risk premium analysis is overstated because of a highly suspect and inflated projected Baa-rated bond yield of 6.34%, and his development of risk premiums is based on the flawed and incomplete assumption that equity risk premiums change by only changes in interest rates. Academic literature is clear that equity risk premiums change based on differences in the perceived risk of equity

[55] Exhibit No. 9.
[56] *Id.*

securities versus bond securities, not simply caused by only changes in nominal interest rates.

Q DO YOU HAVE ANY COMMENTS CONCERNING MR. MCKENZIE'S PROJECTED UTILITY YIELD OF 6.34%?

A Yes. Mr. McKenzie uses a projected AA-rated utility bond yield for the period 2017 through 2021 in the range of 5.41% to 5.50%, with a midpoint of 5.46%. He then adds a current yield spread for BBB-rated and AA-rated utility bond yields of 0.88% to produce his projected yield of 6.34%.[57] This projected yield is incomplete. Current AA-rated utility bond yields are approximately 4.0% as of the 13-week period ending February 3, 2017. Mr. McKenzie's projected increase to AA-rated utility bond yields does not reflect consensus market outlooks.

Q WHY IS MR. MCKENZIE'S USE OF ONLY A SIMPLE INVERSE RELATIONSHIP BETWEEN INTEREST RATES AND EQUITY RISK PREMIUMS UNREASONABLE?

A Mr. McKenzie's belief that there is a simple inverse relationship between equity risk premiums and interest rates is unsupported by academic research. While academic studies have shown that, in the past, there has been an inverse relationship with these variables, researchers have found that the relationship changes over time and is

[57]McKenzie Direct Testimony at 40.

influenced by changes in perception of the risk of bond investments relative to equity investments, and not simply changes to interest rates.[58]

In the 1980s, equity risk premiums were inversely related to interest rates, but that was likely attributable to the interest rate volatility that existed at that time. Interest rate volatility currently is much lower than it was in the 1980s.[59] As such, when interest rates were more volatile, the relative perception of bond investment risk increased relative to the investment risk of equities. This changing investment risk perception caused changes in equity risk premiums.

In today's marketplace, interest rate variability is not as extreme as it was during the 1980s. Nevertheless, changes in the perceived risk of bond investments relative to equity investments still drive changes in equity premiums. However, a relative investment risk differential cannot be measured simply by observing nominal interest rates. Changes in nominal interest rates are highly influenced by changes to inflation outlooks, which also change equity return expectations. As such, the relevant factor needed to explain changes in equity risk premiums is the relative changes to the risk of equity versus debt securities investments, not simply changes to interest rates.

Importantly, Mr. McKenzie's analysis ignores investment risk differentials. He bases his adjustment to the equity risk premium exclusively on changes in nominal interest rates. This is a flawed methodology and does not produce accurate or reliable risk premium return on equity estimates. His results should be rejected by the Commission.

[58] "The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts," Robert S. Harris and Felicia C. Marston, *Journal of Applied Finance*, Volume 11, No. 1, 2001 and "The Risk Premium Approach to Measuring a Utility's Cost of Equity," Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *Financial Management*, Spring 1985.

[59] *Duff & Phelps, 2016 SBBI Yearbook* at 6-7 to 6-10.

Q CAN MR. MCKENZIE'S RISK PREMIUM ANALYSES BASED ON PROJECTED YIELDS BE MODIFIED TO PRODUCE MORE REASONABLE RESULTS?

A Yes. By eliminating the inverse relationship adjustment to the equity risk premium of 3.62% and relying on Mr. McKenzie's current Baa-rated utility yield of 4.41%, will result in a risk premium return on equity of 8.03% (3.62% + 4.41%), rounded to 8.0%. Importantly, Mr. McKenzie's projected Baa-rated bond yield of 6.34% is higher than the current observable market Baa-rated bond yield of 4.72%.

The median equity premium based on the last 10 years as shown on his Exhibit No. 9 is approximately 4.89%. Using current observable Baa-rated bond yields of 4.72%, this would imply a common equity return of 9.6% (4.89% + 4.72%). I believe this more reasonably captures a fair equity risk premium estimate using the data in Mr. McKenzie's study.

Q PLEASE DESCRIBE MR. MCKENZIE'S EXPECTED EARNINGS ANALYSIS.

A Mr. McKenzie's expected earnings analysis is based on *Value Line*'s projected earned return on book equities for his proxy group, adjusted to reflect average year equity returns. Based on a review of projected earnings over the next three to five years, Mr. McKenzie estimates a return on equity for LG&E in the range of 11.3% to 12.2% (Exhibit No. 10).

Q IS THE EXPECTED EARNINGS ANALYSIS A REASONABLE METHOD FOR ESTIMATING A FAIR RETURN ON EQUITY FOR LG&E?

A No. An expected earnings analysis does not measure the return an investor requires in order to make an investment. Rather, it measures the earned return on book equity that companies have experienced in the past or are projected to achieve in the future. The returns investors require in order to assume the risk of an investment are measured from prevailing stock market prices. An expected earnings analysis measures an accounting return on book equity. Therefore, such a return is not developed from observable market data. A return estimate using an expected earnings analysis can differ significantly from the return investors currently require. Therefore, Mr. McKenzie's expected earnings approach should be rejected.

Q DO YOU HAVE ANY ADDITIONAL COMMENTS IN REGARDS TO MR. MCKENZIE'S RETURN ESTIMATES?

A Yes. Mr. McKenzie also performed a DCF model on a non-utility proxy group, which he found to be a reasonable risk proxy for LG&E. I disagree. I find his non-utility group unreasonable. The DCF results of his non-utility group range are presented on Exhibit No. 11.

Q WHY DO YOU CONSIDER MR. MCKENZIE'S NON-UTILITY GROUP UNREASONABLE?

A The companies included in Mr. McKenzie's non-utility proxy group are subject to risks that are different from those affecting LG&E's regulated utility operations. As

noted by the major credit rating agencies, the utility industry has relatively low risk in comparison with the market. Indeed, the regulatory process itself provides an effective mechanism to mitigate some of the market risks influencing the U.S. economy. Therefore, using Mr. McKenzie's non-utility proxy group, which is much riskier than the utility industry, will produce an unreliable and inflated return on equity for a low-risk utility like LG&E. Therefore, the Commission should disregard the results of Mr. McKenzie's non-utility group DCF.

Q CAN YOU PROVIDE AN EXAMPLE OF WHY MR. MCKENZIE'S NON-UTILITY GROUP IS NOT A REASONABLE RISK PROXY GROUP FOR LG&E?

A Yes. One criterion that Mr. McKenzie uses to select a comparable risk non-utility group in order to estimate LG&E's return on equity, is to compare LG&E's bond rating to that of the non-regulated group.[60] While this is a reasonable method of estimating and identifying comparable proxy groups within the industry, doing it across industries is not as straightforward and not as reliable. For example, if bond rating alone would adequately help to identify comparable risk companies across industries, then there should not be any observable clear differences in the investment cost for securities that had different bond ratings. However, the industry or circumstances behind the security have a material role in the market's assessment of a fair compensation.

[60]McKenzie Direct Testimony at 62.

While "AAA" rated corporate bonds and U.S. Treasuries have comparable bond ratings, the risk differential is significant largely because of the operating risk differences between the securities. The U.S. government has virtually minimal default risk on its bond issuances, whereas even a "AAA" rated corporate bond has measurable default risk. Similarly, regulated utility operations and the ability to adjust prices to cost of service provide far less default risk than that of non-regulated companies. A regulated company generally has a franchise to a monopolistic service territory, the ability to set prices based on reasonable and prudent costs, and minimal competition. In significant contrast, a non-regulated entity does not have a franchised or monopolistic customer base, must price its services consistent with what the market will permit, and has far more uncertainty of selling products that produce cash flows that support financial obligations. Therefore, the DCF results produced by Mr. McKenzie's non-utility group should be rejected.

Q WHAT IS YOUR CONCLUSION REGARDING THE APPROPRIATE RETURN ON EQUITY FOR LG&E BASED ON YOUR ANALYSIS?

A My analysis supports a reasonable range of LG&E's current cost of market equity to be from 9.00% to 9.70%, with a midpoint of 9.35%. Applied to LG&E's rate base, and using the Company's capital structure, this will produce a return which meets the *Hope* and *Bluefield* standards, and support LG&E's credit metrics.

The Commission should reject Mr. McKenzie's recommended cost of common equity for the reasons outlined above, primarily because his analysis has artificially inflated LG&E's cost of equity through unreasonable adjustments.

Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A Yes, it does.

Qualifications of Christopher C. Walters

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Christopher C. Walters. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q PLEASE STATE YOUR OCCUPATION.

A I am a Consultant in the field of public utility regulation with the firm of Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

Q PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EMPLOYMENT EXPERIENCE.

A I graduated from Southern Illinois University Edwardsville in 2008 where I received a Bachelor of Science Degree in Business Economics and Finance. I graduated with a Master of Business Administration Degree from Lindenwood University in 2011.

In January 2009, I accepted the position Financial Representative with American General Finance and was quickly promoted to Senior Assistant Manager. In this position I was responsible for assisting in the management of daily operations of the branch, analyzing and reporting on the performance of the branch to upper management, performing credit analyses for consumers and small businesses, as well as assisting home buyers obtain mortgage financing.

In January 2011, I accepted the position of Analyst with BAI. As an Analyst, I performed detailed analysis, research, and general project support on regulatory and

competitive procurement projects. In July 2013, I was promoted to the position of Consultant. As a Consultant, I have performed detailed technical analyses and research to support regulatory projects including expert testimony, and briefing assistance covering various regulatory issues. At BAI, I have been involved with several regulated projects for electric, natural gas and water and wastewater utilities, as well as competitive procurement of electric power and gas supply. My regulatory filing tasks have included measuring the cost of capital, capital structure evaluations, assessing financial integrity, merger and acquisition related issues, risk management related issues, depreciation rate studies, other revenue requirement issues and wholesale market and retail regulated power price forecasts. Since 2011, I have been working with BAI witnesses on utility rate of return filings. Specifically, I have assisted BAI witnesses in analyzing rate of return studies, drafting discovery requests and analyzing responses, drafting rate of return testimony and exhibits and assisting with the review of the briefs.

BAI was formed in April 1995. BAI and its predecessor firm have participated in more than 700 regulatory proceedings in 40 states and Canada.

BAI provides consulting services in the economic, technical, accounting, and financial aspects of public utility rates and in the acquisition of utility and energy services through RFPs and negotiations, in both regulated and unregulated markets. Our clients include large industrial and institutional customers, some utilities and, on occasion, state regulatory agencies. We also prepare special studies and reports, forecasts, surveys and siting studies, and present seminars on utility-related issues.

In general, we are engaged in energy and regulatory consulting, economic analysis and contract negotiation. In addition to our main office in St. Louis, the firm also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

Q HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?

A Yes. I have sponsored testimony before state regulatory commissions including: Arkansas, Delaware, Kansas, Michigan, Ohio and Oklahoma. I have also filed an affidavit before the Federal Energy Regulatory Commission ("FERC").

Q PLEASE DESCRIBE ANY PROFESSIONAL REGISTRATIONS OR ORGANIZATIONS TO WHICH YOU BELONG.

A I earned the Chartered Financial Analyst ("CFA") designation from the CFA Institute. The CFA charter was awarded after successfully completing three examinations which covered the subject areas of financial accounting and reporting analysis, corporate finance, economics, fixed income and equity valuation, derivatives, alternative investments, risk management, and professional and ethical conduct. I am a member of the CFA Institute and the CFA Society of St. Louis.