

WYOMING DEPARTMENT OF REVENUE  
MINERAL TAX DIVISION

# CAPITALIZATION RATE STUDY

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MODIFIED NETBACK RATE OF RETURN

Production Year 2017

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# CAPITALIZATION RATE STUDY

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## MODIFIED NETBACK RATE OF RETURN

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### INTRODUCTION

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The capitalization rate applied to income is a means of estimating market value for properties. This capitalization rate reflects the relationship between one year's income or an annual average of several years' income and the corresponding capital value. This market value estimated by capitalizing an income is one indicator of what a willing buyer and a willing seller may consider a fair return on their investment in the open market.

The primary components of the capitalization rate are Debt, Preferred (if applicable), and Common Equity. The following data have been assembled to determine a rate of return for the Modified Netback valuation method.

The Mineral Tax Division develops its capitalization rates in accordance with WY Title 39-14-203(b)(vi)(E) and WY Title 39-14-201. As such, the capitalization rate used for all producers utilizing the Modified Netback method of valuation is derived from a calculation consisting of the highest ten producers of natural gas in the State of Wyoming.

### SOURCES OF INFORMATION AND DATA

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Source data used to compute the capitalization rates for the largest ten natural gas producers (top ten producers) was acquired from various sources:

- 1) Moody's Investor Service (February 13, 2018) and Standard & Poor's Record (February 13, 2018) provided bond ratings for the companies. In addition, the 2017 annual Debt Rates and Preferred Rates by industry grouping came from the same source.
- 2) Value Line provided statistical information. The data from Value Line included Betas, 2018 projected Annual Rates of Change in Earnings, Dividends, Book Value and Annual Total Return. Value Line also provided data for the calculation of the risk free (RF) rates; the specific weekly rates are detailed in Exhibit C of this report.
- 3) The required return on market (RM) came from the Duff & Phelps 2017 Valuation Handbook, "Guide to Cost of Capital" and is based on the arithmetic mean return realized on common stocks. This information source also supplied data used to develop the risk premium (RP) and firm size and adjustments.
- 4) The Wall Street Journal for January 2, 2018, was the source for stock prices for individual companies, as required in the Discounted Cash Flow Model and the Direct Capitalization Rates.
- 5) The Public Utility Financing Tracker provided the data for computing flotation costs.

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## CAPITAL STRUCTURE

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For appraisal purposes, capital structure has three components: long-term debt, preferred stock and net worth (or common equity or, simply, equity). It differs from financial structure, which includes other, primarily, short-term sources of capital, such as payables and operating loans. There are two primary methods of computing capital structure for appraisals - book structure and market structure. Book structure uses the relationships of the book values (i.e., accounting values) of debt, preferred and equity. Market structure uses the market values of these components. The appropriate capital structure to use in a capitalization rate study for the modified netback rate of return is the market structure of the publicly traded companies (often the parent holding companies) because it reflects the structure which a typical purchaser would probably use to acquire the operating assets of a subject company. To compute market capital structure, we used the book value of debt and preferred securities (since there usually are no material differences between book and market value for these securities), as reported in Value Line. We computed the market value of common equity by multiplying the shares outstanding by the recent price, also as reported in Value Line. The average market capital structure for the companies in the study population is as follows:

	DEBT	PREFERRED	EQUITY
Top 10 Producers	31%	0%	69%

*Table 1. Capital Structure*

These percentages will later be used to compute the cost of capital for the industry.

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## COST OF EQUITY

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The current cost of equity capital should be based on data taken from the capital markets for the top ten producers. Equity rates should reflect the representative cost of equity financing for a given industry type as of the appraisal date. There is no single commonly accepted method for making this estimate. However, there are three generally accepted methods which can be used in conjunction with each other. These include (1) the Discounted Cash Flow (DCF) model, (2) Capital Asset Pricing Model (CAPM), and (3) Risk Premium (RP) model.

**The Discounted Cash Flow Model (DCF):** This model measures the rate of return requirements of industrial stock (equity) as demonstrated by investors in the market. The basic theory of DCF is that the prices paid for a share of stock reflect the investors' discounted present values of future expected earnings/anticipated cash flows for both dividends and stock appreciation. The basic formula appears in the box to the right. The  $D_1$  variable comes from the dividend declared per share Value Line has projected for 2018.  $P_0$  is the average of the annual high and low prices of the stocks of the companies in our study. The growth factor in the

$$K_E = \frac{D_1}{P_0} + G$$

where:

$K_E$  = Cost of Capital  
 $D_1$  = Projected Dividend  
 $P_0$  = Current Stock Price  
 $G$  = Growth

model was computed using a weighted average of the growth indicators: Earnings, 1/6; Book Value, 2/6; and Dividends, 3/6. The Department looks at three computations of the DCF to determine the relative propriety of the indicator: 1) a DCF model that reduces the impact of any company for whom the projected dividend or any of the growth factors is "Nil" or "NMF" per Value Line; 2) a

DCF model which adjusts for the “Nil” and “NMF” items; and 3) a DCF model calculated on the average dividends, growth factors, and stock prices of the companies in the study group. Application of this model resulted in the equity rate shown in Table 3.

**Capital Asset Pricing Model (CAPM):** CAPM uses the concept that value is composed of a "safe rate" plus an add-on for equity risk. The market risk premium is defined as the difference between the expected rate of return in a given investment and the "risk-free rate" on government Treasury Bonds. This definition is based upon the premise that an informed investor expects to earn a greater return on his equity capital investment than he would receive from an alternative investment in risk free government bonds. Theoretically, the greater the investor's perceived risk in investment, the greater the risk premium. However, in the CAPM, the risk premium for the overall market must be adjusted by a market risk measure, "Beta", for the companies under review. The basic formula appears in the box at the right. Various versions of the CAPM take into account the different equity perceptions that prevail in the oil and gas industry, i.e. Long-Term, Intermediate, Short-Term and Corporate. Application of this formula to the various risk groups resulted in the use of the rate presented in Table 3.

$$K_E = R_F + B(R_M - R_F)$$

where:

$K_E$  = Cost of Capital  
 $R_F$  = Risk Free Rate  
 $B$  = Beta  
 $R_M$  = Return on the Market

**Risk Premium Model (RP):** This model assumes that the rate of return required by equity investors depends upon: (1) the risk-free rate of return or what investors could obtain by investing in Treasury Bonds, which have an assured rate of return guaranteed by the U.S. Government, and (2) some risk premium, or an amount of compensation above the risk-free rate required to induce investors to invest their money in a risky stock. The formula appears in the box on the right. Various versions of the Risk Premium consider the different equity per-captions that prevail in the oil and gas industry, i.e. Long-Term, Intermediate, Short-Term and Corporate.

$$K_E = R_F + R_P$$

where:

$K_E$  = Cost of Capital  
 $R_F$  = Risk Free Rate  
 $R_P$  = Risk Premium

As a matter of form, the Department calculates Long-Term, Intermediate, Short-Term and Corporate rates for both the CAPM and RP models. We then determine which rate is most appropriate for the top ten producers. The two primary considerations are the nature the operating assets and the term of debt instruments for companies within the industry. Generally speaking, the major assets of oil and gas companies have useful lives in excess of twenty years. Further, these oil and gas companies often issue debt with maturities in excess of twenty years. For these reasons, we consider the long-term rate, as shown in the table below, to be the most appropriate for the ten oil and gas companies used as a basis for the rate of return calculation.

	DCF	CAPM	RP
Top 10 Producers	6.56%	13.62%	9.94%

Table 3: Equity Rates

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## CONCLUSION REGARDING THE EQUITY RATE

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For the cost of equity, rates from the CAPM, RP model and the traditional DCF models were given consideration for the ten oil and gas companies. The resulting equity capitalization rate, adjusted for flotation cost for the top ten producers is 7.16%.

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## FLOTATION COST ADJUSTMENTS

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The costs of the various types of capital determined in the previous sections of this report consider only secondary market rates, the rates of return to be earned by the holders of the securities. These rates do not reflect any adjustment for primary costs, those costs a company incurs to raise capital initially. When a company issues new securities, it incurs legal, underwriting and accounting expenses. These expenses are known as “flotation” costs. They reduce the amount of actual proceeds the company receives from the issuance of the securities. As a result the effective required rates of return for the different types of securities are somewhat higher than the secondary rates indicate. Flotation costs are expressed as a percentage of the proceeds of the issue. To determine the true cost of capital the secondary rates must be adjusted for the flotation costs.

The objective of the flotation cost adjustment is to determine the effective rate of return for a security based on the net proceeds from the security issue. To calculate the real required rate of return for the two basic types of securities (debt and equity), we use the formulas in the box to the right. (Note: the term “equity” applies to both common and preferred stock issues.)

The formula for the debt rate requires some explanation. The reason for the income tax rate adjustment lies in the nature of flotation costs for debt issues. Under income tax law such costs are amortized and deducted to determine taxable income; however, they are not deductible to determine net operating income. Thus, the flotation cost has to be adjusted to recognize the difference between the tax treatment and the appraisal treatment of the flotation costs. There is no similar adjustment to the flotation costs for equity issues because they are not deductible for income tax purposes; the financial statements of the issuer simply reflect the net proceeds of the issue. The Department uses an income tax rate of 38% to incorporate the maximum federal corporate income tax rate of 35% plus an allowance of three percentage points for an average effective state corporate income tax rate.

***For Debt:***

$$K_A = \frac{K_B}{1 - (FC \times (1 - TR))}$$

***For Equity (Common and Preferred):***

$$K_A = \frac{K_B}{1 - FC}$$

where:

$K_A$  = Adjusted Cost of Capital

$K_B$  = Unadjusted (Base) Cost of Capital

FC = Flotation Cost as a Percentage

TR = Income Tax Rate (38%)

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## OVERALL WEIGHTED AVERAGE COST OF CAPITAL

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The Mineral Tax Division computed an overall weighted average cost of capital using the band of investment method. The basic formula appears in the box at the right. The resulting capitalization rate (also known as the discount rate) will be applied to the appropriate income stream to determine indicators of the current market value for the top ten producers. The results of this band of investment analysis for the cost of capital appear in Exhibit A.

$$K = (D \times D_R) + (P \times P_R) + (E \times E_R)$$

where:

K = Weighted Average Cost of Capital

D = Percent of Debt in Capital Structure

D<sub>R</sub> = Cost of Debt (Debt Rate)

P = Percent of Preferred in Capital Structure

P<sub>R</sub> = Cost of Preferred (Preferred Rate)

E = Percent of Equity in Capital Structure

E<sub>R</sub> = Cost of Equity (Equity Rate)

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## DIRECT CAPITALIZATION

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Direct capitalization is a valuation technique which takes a single year's income (or some other common unit of comparison) divided by a rate (or multiplied by a factor) to derive an estimate of value. This technique is often used in real estate appraisal to determine an overall or total valuation of the property. Income, whether potential gross income, effective gross income, or net operating income, is divided by the sales prices for comparable properties and the resulting ratio is then divided into the same level of income for the subject property to determine an overall valuation estimate.

This approach is not limited to various levels of income. The same concepts are used in the sales comparison approach, where various units of comparison are divided into the sales prices of comparable properties. The resulting rates (ratios) are then divided into the comparable units for the subject property to calculate an overall value.

The same procedures can be applied to ten producers. However, because direct capitalization is a comparable sales technique, it requires a higher level of comparability between the subject property (company) and the comparable than is required for yield capitalization. The process is one of identifying units of comparison, dividing such units by the sales price and applying the resulting average factor to the subject property (company). In the Direct Capitalization Study the goal is to develop value estimates for three distinct components system value: equity, preferred, and debt. This is a similar concept to the use of the Band of Investment method of rate development.

The Capitalization Rate Study lists six units of comparison for equity value from the December 2017, issue of The Value Line Investment Survey for the ten producers. All six units are shown on a per share basis for each individual company within the industry. The price per share used to compute the ratios is the same average of the 52-week highs and lows of the publicly traded prices for the preceding calendar year use in the DCF model. The resulting ratios appear in the table below. They are then divided into the appropriate figures for the subject company to obtain the estimate of value for the equity portion of the company.

	RATE
Revenue (Sales) per Share	77.26%
“Cash Flow” per Share	15.37%
Earnings per Share	3.82%
Dividends Declared per Share	1.82%
Capital Spending/Gross Equipment per Share	15.64%
Book Value per Share	60.26%

*Table 4. Direct Capitalization Rates*

It is important to emphasize that the developed value represents the value of the equity portion of the company, not the value of the item capitalized. This is because the basis for all the ratios is price per share of the common stock (or equity) of the company. After developing the equity value, the value of the preferred stock and the long-term debt must be derived directly from the market.

The market value of the preferred stock (if applicable) is obtained by dividing the preferred dividends paid by the subject company by the market preferred yield rate. The market value of the long-term debt is likewise found by dividing the long-term interest expense by the debt yield rate. Finally, the three portions (equity, preferred stock, and long-term debt) are added together to develop an estimate of the total value for the company.

The final step in calculating the Direct Capitalization indicator of value is to determine the market value for the operating property. It uses a factor developed in the stock and debt approach to remove non-operating property from the value of the company. Ratios that are generally utilized are the asset influence (operating assets divided by total assets), the income influence (operating income divided by total income), or an average of the two. The value of the non-operating property is thus excluded from the total valuation to determine the final value for the operating property by the Direct Capitalization approach.



# **EXHIBIT A**

## **WEIGHTED AVERAGE COST OF CAPITAL**

## Production Year 2017 Rate of Return on Investment

<u>Type of Capital</u>	<u>Cost of Capital</u>	<u>Flotation Cost</u>	<u>Adjusted Cost of Capital</u>	x	<u>Percent of Structure</u>	=	<u>Weighted Average Cost of Capital</u>	
Debt	5.19%	2.12%	5.30%		31%		1.6218%	
Preferred		<i>Not Applicable</i>					0.0000%	
Equity	10.04%	2.70%	10.32%		69%		7.1621%	
<b>Modified Netback Rate of Return</b>								<u><u>8.7839%</u></u>

# **EXHIBIT B**

## **DEBT & EQUITY INFORMATION**

Wyoming Department of Revenue  
 Netback Return on Investment Calculation  
 Debt to Equity Ratio's  
 Production Year: 2017

2017 Netback Return on Investment.xls  
 Debt - Equity

Company Name	Production Year 2017			Calculated from Source			
	a Long Term Debt	b Shares of Common Stock*	c Value Line Recent Price	d Value of Equity <i>d=b*c</i>	e Debt & Equity <i>e=a+d</i>	f Debt % <i>a/e</i>	g Equity % <i>100%-f</i>
Anadarko Petroleum	\$15,436,000,000	550,219,665	\$48.05	\$26,438,054,903	\$41,874,054,903	37%	63%
BP p.l.c.	\$56,900,000,000	3,290,000,000	\$39.00	\$128,310,000,000	\$185,210,000,000	31%	69%
Chesapeake Energy	\$9,899,000,000	908,685,855	\$3.87	\$3,516,614,259	\$13,415,614,259	74%	26%
Chevron Corp	\$33,983,000,000	1,899,373,928	\$114.72	\$217,896,177,020	\$251,879,177,020	13%	87%
Conoco Phillips	\$19,670,000,000	1,216,949,231	\$50.99	\$62,052,241,289	\$81,722,241,289	24%	76%
Devon Energy	\$10,380,000,000	525,500,000	\$37.41	\$19,658,955,000	\$30,038,955,000	35%	65%
Encana Corp	\$4,197,000,000	973,100,000	\$11.63	\$11,317,153,000	\$15,514,153,000	27%	73%
EOG Resources	\$6,380,400,000	578,219,230	\$101.44	\$58,654,558,691	\$65,034,958,691	10%	90%
ExxonMobil	\$24,869,000,000	4,327,106,177	\$80.55	\$348,548,402,557	\$373,417,402,557	7%	93%
QEP Resources Inc.	\$1,890,600,000	240,935,039	\$8.67	\$2,088,906,788	\$3,979,506,788	48%	52%

\* BP p.l.c is traded using American Depository Receipt's (ADR's). An ADR represents the ownership in the shares of a foreign company trading on US financial markets. The stock of many non-US companies trades on US exchanges through the use of ADRs. ADRs enable US investors to buy shares in foreign companies without undertaking cross-border transactions. ADRs carry prices in US dollars, pay dividends in US dollars, and can be traded like the shares of US-based companies

# **EXHIBIT C**

## **RISK FREE RATES**

## Risk Free Rate for 2017 Capitalization Rates

Long Term Risk Free Rate: 2.94%

Source:

2017 weekly Value Line Investment Survey Selection & Opinions reports, "Selected Yields" Section, average of the annual high and low for the weekly 30-year U.S. Treasury Securities Yield.

Intermediate Risk Free Rate: 2.34%

Source:

2017 weekly Value Line Investment Survey Selection & Opinion reports, "Selected Yields" Section, average of the annual high and low for the weekly 10 year US Treasury Securities yield rates

Short Term Risk Free Rate: 1.96%

Source:

2017 weekly Value Line Investment Survey Selection & Opinion reports, "Selected Yields" Section, average of the annual high and low for the weekly 5 year US Treasury Securities yield rates

Corporate Risk Free Rate: 4.05%

Source:

2017 weekly Value Line Investment Survey Selection & Opinion reports, "Market Monitor" Section, average of the annual high and low for the weekly Mergent Aaa Corporate bond yield

Prime Lending Rate: 4.50%

Source:

Wall Street Journal, January 2, 2018 edition, "Markets Digest" section

# **EXHIBIT D**

**DUFF & PHELPS DATA**

# Duff and Phelps 2016 & Preliminary 2017 Valuation Handbook

## Guide to Cost of Capital (Market Results for 1926 - 2016)

<u>Series</u>		<u>Geometric Mean</u>	<u>Arithmetic Mean</u>	<u>Standard Deviation</u>
Large Company Stocks	Total Return	10.00%	12.00%	19.90%
Small Company Stocks	Total Return	12.10%	16.60%	31.90%
Long-Term Corporate Bonds	Total Return	6.00%	6.30%	8.40%
Long-Term Government Bonds	Total Return	5.50%	6.00%	9.90%
	Income Return	5.00%	5.00%	2.60%
Intermediate-Term Government Bonds	Total Return	5.10%	5.30%	5.60%
	Income Return	4.40%	4.40%	2.90%
U.S. Treasury Bills	Total Return	3.40%	3.40%	3.10%
Inflation		2.90%	3.00%	4.10%

	<u>Long Term Equity Risk Premium</u>	<u>Intermediate Equity Risk Premium</u>	<u>Short Term Equity Risk Premium</u>	<u>Corporate Equity Risk Premium</u>
<b>RP Rate Calculation (Rated Companies)</b> <i>(Using Arithmetic Means)</i>				
<b>Base:</b>				
Total return on Large Company Stocks	12.00%	12.00%	12.00%	12.00%
<b>Risk Free Rates:</b>				
Income Return on Long-Term Government Bonds	5.00%			
Income Return Intermediate-Term Government Bonds		4.40%		
Total Return on U.S. Treasury Bills			3.40%	
Total Return on Long-Term Corporate Bonds				6.30%
<b>Equity Risk Premiums</b>	<b>7.00%</b>	<b>7.60%</b>	<b>8.60%</b>	<b>5.70%</b>

Note: This is the most recent data currently available.



# **EXHIBIT E**

## **LIBRARY OF RATINGS**

# State of Wyoming - Department of Revenue

## Capitalization Rate Study

Production Year 2017

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
COMPANY DATA													
Capital Structure													
Company Name	Standard & Poors Credit Rating	Moody's Credit Rating	Value Line Source	% of Debt	% of Preferred Stock	% of Common Equity	Type of Operations (pure or diversified)	Projected Dividend Per Share (2017)	Earnings Growth Rate	Dividends Growth Rate	Book Value Growth Rate	Beta	Wall Street Journal Common Stock Price
Value Line Data													
Anadarko Petroleum	BBB	Ba1	Issue 12; 11/3/2017	37%	0%	63%	Diversified	\$0.20	NMF	-6.5%	-3.5%	1.65	\$56.14
BP p.l.c.	A-	A1	Issue 3; 12/1/2017	31%	0%	69%	Diversified	\$2.40	32.5%	2.5%	50.0%	1.20	\$37.67
Chesapeake Energy	B-	B3	Issue 3; 12/1/2017	74%	0%	26%	Diversified	Nil	NMF	NMF	NMF	2.15	\$5.37
Chevron Corp	AA-	Aa2	Issue 3; 12/1/2017	13%	0%	87%	Diversified	\$4.40	15.0%	2.5%	1.0%	1.20	\$114.38
Conoco Phillips	A-	Baa1	Issue 12; 11/3/2017	24%	0%	76%	Diversified	\$1.12	NMF	-6.5%	5.0%	1.40	\$49.32
Devon Energy	BBB	Ba1	Issue 3; 12/1/2017	35%	0%	65%	Diversified	\$0.24	15.0%	-10.5%	-1.0%	1.80	\$39.12
Encana Corp	BBB	Ba2	Issue 3; 12/1/2017	27%	0%	73%	Diversified	\$0.06	24.0%	-8.5%	2.5%	1.70	\$10.93
EOG Resources	BBB+	Baa1	Issue 3; 12/1/2017	10%	0%	90%	Diversified	\$0.67	29.0%	7.5%	4.5%	1.45	\$95.83
ExxonMobil	AA+	Aaa	Issue 3; 12/1/2017	7%	0%	93%	Diversified	\$3.14	10.5%	3.5%	4.5%	0.95	\$83.70
QEP Resources Inc.	BB+	Ba3	Issue 3; 12/1/2017	48%	0%	52%	Diversified	Nil	NMF	Nil	NMF	1.75	\$13.27
Mean				31%	0%	69%		\$1.22	21.0%	-1.8%	7.9%	1.53	\$50.57
Median				29%	0%	71%		\$0.90	19.5%	-2.0%	3.5%	1.55	\$44.22
Minimum				7%	0%	26%		\$0.06	10.5%	-10.5%	-3.5%	0.95	\$5.37
Maximum				74%	0%	93%		\$4.40	32.5%	7.5%	50.0%	2.15	\$114.38

Ⓐ - Calculation for Discounted Cash Flow (Traditional Model) is  $((i)/(n)) + ((i)^2) + ((j)^3) + (k)/6$

- - The Weighted Cap Rate is calculated using the total of all growth rates divided by the total of all weighting factors

# - Long Term Equity Risk Premium from 2015 Duff & Phelps Valuation Handbook Guide to Cost of Capital

# State of Wyoming - Department of Revenue Capitalization Rate Study

Production Year 2017

(a)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)
	INDUSTRY DATA											
12/31/2017												
Company Name	Long-Term Risk Free Rate	Long-Term Equity Risk Premium #	Intermediate Risk Free Rate	Intermediate Equity Risk Premium	Short-Term Risk Free Rate	Short-Term Equity Risk Premium	Corp. Risk Free Rate	Corp. Equity Risk Premium	Long-Term Risk Premium (o)+(p)	Intermediate Risk Premium (q)+(r)	Short-Term Risk Premium (s)+(t)	Corporate Risk Premium (u)+(v)
Anadarko Petroleum	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
BP p.l.c.	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
Chesapeake Energy	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
Chevron Corp	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
Conoco Phillips	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
Devon Energy	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
Encana Corp	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
EOG Resources	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
ExxonMobil	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
QEP Resources Inc.	2.94%	7.00%	2.34%	7.60%	1.96%	8.60%	4.05%	5.70%	9.94%	9.94%	10.56%	9.75%
Mean												
Median												
Minimum												
Maximum												

# State of Wyoming - Department of Revenue

## Capitalization Rate Study

Production Year 2017

(a)	(aa)	(ab)	(ac)	(ad)	(ae)	(af)	(ag)	(ah)	(ai)
COMPANY FINANCIAL CALCULATIONS									
Capital Asset Pricing Model									
Company Name	Long-Term CAPM	Intermediate CAPM	Short-Term CAPM	Corporate CAPM	Traditional Model	Treating "Nil" as Zero	Based on Library Averages	Value Line Page Number	NYSE Ticker
	(a)+(p)*(m)	(q)+(r)*(m)	(s)+(t)*(m)	(u)+(v)*(m)	@	(i)/(n)+(bb)	(bb)		
Anadarko Petroleum	14.49%	14.88%	16.15%	13.46%	NMF	-4.06%	-4.42%	2401	APC
BP p.l.c.	11.34%	11.46%	12.28%	10.89%	39.71%	29.71%	23.33%	503	BP
Chesapeake Energy	17.99%	18.68%	20.45%	16.31%	NMF	NMF	NMF	529	CHK
Chevron Corp	11.34%	11.46%	12.28%	10.89%	12.10%	7.93%	4.08%	507	CVX
Conoco Phillips	12.74%	12.98%	14.00%	12.03%	NMF	0.69%	-1.58%	2405	COP
Devon Energy	15.54%	16.02%	17.44%	14.31%	6.03%	-2.47%	-3.08%	532	DVN
Encana Corp	14.84%	15.26%	16.58%	13.74%	11.97%	1.13%	0.58%	535	EOG
EOG Resources	13.09%	13.36%	14.43%	12.32%	17.95%	10.78%	10.08%	533	XOM
ExxonMobil	9.59%	9.56%	10.13%	9.47%	11.09%	8.75%	5.00%	509	QEP
QEP Resources Inc.	15.19%	15.64%	17.01%	14.03%	NMF	NMF	NMF	543	WPX
Mean	13.62%	13.93%	15.08%	12.74%	16.47%	6.56%	4.25%		
Median	13.79%	14.12%	15.29%	12.89%	12.03%	4.53%	2.33%		
Minimum	9.59%	9.56%	10.13%	9.47%	6.03%	-4.06%	-4.42%		
Maximum	17.99%	18.68%	20.45%	16.31%	39.71%	29.71%	23.33%		

# State of Wyoming - Department of Revenue

## Capitalization Rate Study

Production Year 2017

(a)	(aj)	(ak)	(al)	(am)	(an)	(ao)	(ap)	(aq)	(ar)	(as)	(at)	(au)
	Revenue (Sales) Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Declared Per Share	Capital Spending Per Share	Book Value Per Share	Revenue (Sales) Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Declared Per Share	Capital Spending Per Share	Book Value Per Share
	(ap)/(n)	(aq)/(n)	(ar)/(n)	(as)/(n)	(at)/(n)	(au)/(n)	Value Line Direct Capitalization Data					
12/31/2017	DIRECT CAPITALIZATION ANALYSIS											
	Computed Equity Ratios						Value Line Direct Capitalization Data					
Company Name	Revenue (Sales) Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Declared Per Share	Capital Spending Per Share	Book Value Per Share	Revenue (Sales) Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Declared Per Share	Capital Spending Per Share	Book Value Per Share
	(ap)/(n)	(aq)/(n)	(ar)/(n)	(as)/(n)	(at)/(n)	(au)/(n)	(ap)/(n)	(aq)/(n)	(ar)/(n)	(as)/(n)	(at)/(n)	(au)/(n)
Anadarko Petroleum	38.03%	10.69%	3.83%	0.36%	12.29%	36.78%	\$21.35	\$6.00	\$2.15	\$0.20	\$6.90	\$20.65
BP p.l.c.	187.04%	16.33%	4.65%	6.37%	13.94%	79.65%	\$70.45	\$6.15	\$1.75	\$2.40	\$5.25	\$30.00
Chesapeake Energy	186.39%	41.01%	8.39%	0.00%	40.07%	68.03%	\$10.00	\$2.20	\$0.45	Nil	\$2.15	\$3.65
Chevron Corp	64.87%	12.94%	3.72%	3.78%	8.74%	67.63%	\$74.20	\$14.80	\$4.25	\$4.32	\$10.00	\$77.35
Conoco Phillips	47.75%	12.47%	0.71%	2.15%	7.40%	59.61%	\$23.55	\$6.15	\$0.35	\$1.06	\$3.65	\$29.40
Devon Energy	65.31%	12.01%	4.47%	0.61%	13.68%	35.79%	\$25.55	\$4.70	\$1.75	\$0.24	\$5.35	\$14.00
Encana Corp	39.80%	11.44%	3.93%	0.55%	15.10%	65.87%	\$4.35	\$1.25	\$0.43	\$0.06	\$1.65	\$7.20
EOG Resources	19.36%	6.89%	0.78%	0.70%	6.99%	25.36%	\$18.55	\$6.60	\$0.75	\$0.67	\$6.70	\$24.30
ExxonMobil	73.60%	9.56%	4.30%	3.66%	5.08%	51.62%	\$61.60	\$8.00	\$3.60	\$3.06	\$4.25	\$43.20
QEP Resources Inc.	50.49%	20.35%	3.39%	0.00%	33.16%	112.28%	\$6.70	\$2.70	\$0.45	Nil	\$4.40	\$14.90
Mean	77.26%	15.37%	3.82%	1.82%	15.64%	60.26%	\$31.63	\$5.86	\$1.59	\$1.20	\$5.03	\$26.47
Median	57.68%	12.24%	3.88%	0.66%	12.98%	62.74%	\$22.45	\$6.08	\$1.25	\$0.87	\$4.83	\$22.48
Minimum	19.36%	6.89%	0.71%	0.00%	5.08%	25.36%	\$4.35	\$1.25	\$0.35	\$0.06	\$1.65	\$3.65
Maximum	187.04%	41.01%	8.39%	6.37%	40.07%	112.28%	\$74.20	\$14.80	\$4.25	\$4.32	\$10.00	\$77.35

# State of Wyoming - Department of Revenue

## Capitalization Rate Study

Production Year 2017

	(av)	(aw)	(ax)	(ay)	(az)	(ba)	(bb)	(bc)	(bd)	(be)	(bf)	(bg)	(bh)	(bi)	(bj)	
12/31/2017	Capitalization Weighting															
Company Name	Factor	Weighted Earning Growth Rate	Factor	Weighted Dividend Growth Rate	Factor	Weighted Book Value Growth Rate	Weighted Cap. Rate	Disc. Cash Flow	Long Term Debt	Risk Premium	Total	Weighted Disc. Cash Flow	Long Term Debt	Weighted Risk Premium	Total	
		(i)*(aw)		(k)*(ax)		(l)*(az)	-									
Anadarko Petroleum	1	0.0%	3	-19.5%	2	-7.0%	-4.4%	33.00%	33.00%	34.00%	100%	2.16%	4.49%	3.38%	10.04%	
BP p.l.c.	1	32.5%	3	7.5%	2	100.0%	23.3%	66.00%	34.00%	0.00%	100%	4.33%	4.63%	0.00%	8.96%	
Chesapeake Energy	1	0.0%	3	0.0%	2	0.0%	NMF	34.00%	66.00%	0.00%	100%	2.23%	8.99%	0.00%	11.22%	
Chevron Corp	1	15.0%	3	7.5%	2	2.0%	4.1%	0.00%	33.00%	67.00%	100%	0.00%	4.49%	6.66%	11.15%	
Conoco Phillips	1	0.0%	3	-19.5%	2	10.0%	-1.6%	33.00%	0.00%	67.00%	100%	2.16%	0.00%	6.66%	8.82%	
Devon Energy	1	15.0%	3	-31.5%	2	-2.0%	-3.1%	66.00%	0.00%	34.00%	100%	4.33%	0.00%	3.38%	7.71%	
Encana Corp	1	24.0%	3	-25.5%	2	5.0%	0.6%	0.00%	66.00%	34.00%	100%	0.00%	8.99%	3.38%	12.37%	
EOG Resources	1	29.0%	3	22.5%	2	9.0%	10.1%									
ExxonMobil	1	10.5%	3	10.5%	2	9.0%	5.0%									
QEP Resources Inc.	1	0.0%	3	0.0%	2	0.0%	NMF									
Mean																
Median																
Minimum																
Maximum																
															<b>AVERAGE</b>	<b>10.04%</b>

# **EXHIBIT F**

## **FLOTATION COST DATA**

**2017 Summary of Flotation Cost Analyses**  
**Public Utilities Financing Tracker 2012 - 2016**  
 March 2017

<b>DEBT:</b>	<b>Number of Companies</b>	<b>Rate (Wtd. Avg.)</b>
Public Utilities Financing Tracker 2011 - 2015	372	2.12%

<b>COMMON:</b>		
Public Utilities Financing Tracker 2011 - 2015	23	2.70%



**FLOTATION COST ANALYSIS 2017**

**COMMON STOCK ISSUES - PUBLIC OFFERINGS - 2012 to 2016**

(NOTE: NO GOOD COMMON STOCK ISSUES IN 2012 FOR THIS STUDY.)

Company	Type of Utility	Year Issued	Number of Shares (000)	Amount Offered (\$000)	Underwriter Commission		EARNINGS PER SHARE	Estimated Expenses (000)	Flotation Cost		
					Per Share (\$)	% of Price (%)			\$000	Per Cent %	Wtd Avg %
PIEDMONT NATURAL GAS CO.	GAS	2013	4,000	128,000	1.120	0.035	NA	350	4,830	3.77%	0.04%
PORTLAND GENERAL ELECTRIC CORP	ELEC	2013	11,100	327,450	0.959	0.033	NA	600	11,245	3.43%	0.10%
GAS NATURAL INC	GAS	2013	1,500	15,000	0.575	0.058	NA	285	1,148	7.65%	0.01%
WESTAR ENERGY	ELEC	2013	8,000	249,200	1.090	0.035	NA	250	8,970	3.60%	0.08%
UIL HOLDINGS CORP	ELEC	2013	5,000	186,350	1.304	0.035	NA	250	6,770	3.63%	0.06%
ALLETE, INC	ELEC	2014	2,800	1,393,000	1.741	3.500	NA	450	5,325	0.38%	0.05%
EXELON CORP	ELEC	2014	20,000	75,000	1.500	0.300	NA	1000	31,000	41.33%	0.27%
EXELON CORP	ELEC	2014	50,000	1,750,000	1.050	3.000	NA	600	53,100	3.03%	0.45%
DOMINION RESOURCES	ELEC	2014	18,000	75,000	0.900	1.800	NA	1500	17,700	23.60%	0.15%
TECO ENERGY	ELEC	2014	15,500	75,000	0.611	3.375	NA	350	9,821	13.09%	0.08%
FRONTIER COMMUNICATION CORP	TEL	2015	150,000	750,000	0.150	0.025	NA	2000	24,500	3.27%	0.21%
PG&E CORP	ELEC	2015	6,800	352,308	2.794	0.054	49.016	190	19,189	5.45%	0.16%
HC2 HOLDINGS INC	TEL	2015	7,350	51,450	0.350	0.369	-0.220	1900	4,473	8.69%	0.04%
BLACKHILLS CORP	ELEC	2015	5,200	260,000	1.500	0.073	NA	1700	9,500	3.65%	0.08%
BLACKHILLS CORP	ELEC	2015	5,500	221,375	1.410	0.086	NA	1200	8,955	4.05%	0.08%
SPECTRA ENERGY CORP	GAS	2016	1,400	210,000	0.270	0.900	NA	500	878	0.42%	0.01%
SOUTH JERSEY INDUSTRIES INC	GAS	2016	7,000	49,875	0.919	3.500	NA	NA	6,432	12.90%	0.06%
SPIRE INC	GAS	2016	1,900	1,891,500	2.049	3.250	NA	NA	3,893	0.21%	0.03%
NEXTERA ENERGY INC	ELEC	2016	30,000	1,466,250	0.375	-0.767	6.060	NA	11,250	0.77%	0.10%
CHESAPEAKE UTILITIES CORP	GAS	2016	835	51,987	2.330	3.742	2.730	157	2,103	4.04%	0.02%
GREAT PLAINS ENERGY INC	ELEC	2016	52,600	1,391,270	0.794	3.000	1.370	5260	46,998	3.38%	0.40%
DTE ENERGY CO	ELEC	2016	12,000	600,000	1.500	3.000	NA	750	18,750	3.13%	0.16%
AQUA VENTURE HOLDINGS LTD	WATER	2016	6,500	117,000	1.260	7.000	NA	585	8,775	7.50%	0.08%
<b>Flotation Cost All Companies</b>				<b>11,686,915</b>					<b>Average</b>	<b>7.00%</b>	<b>2.70%</b>

**FLOTATION COST ANALYSIS 2017  
DEBT ISSUES - PUBLIC OFFERINGS 2012 to 2016**

Company	Issue	Type of Utility	Year Issued	Amount Offered (\$000)	Price to Public (%)	Underwritten Commission (%)	Discount or Premium	Gross Proceeds to Issuer	Net Proceeds to Issuer	Estimated Expenses (\$000)	Floating Amount (\$000)	Per Cent (%)	Weighted Average (%)
VIRGINIA ELEC & POWER CO.	SR NOTES, SER. A NOTES	ELEC	2012	430,000	98.400	0.750	0.9765	\$439,425	\$435,000	250	3,623	3.16%	0.0095%
APS	SR SEC	ELEC	2012	325,000	98.620	0.650	0.9797	\$318,403	\$315,802	483	3,601	2.83%	0.0062%
CENTER POINT ENERGY TRANSITION CO.	SR SEC TRANSITION BONDS, TRANCH A-J	ELEC	2012	681,262	99.940	0.760	0.9918	\$675,676	\$666,398	4100	9,278	2.18%	0.0100%
TAMPA ELECTRIC CO	NOTES	ELEC	2012	230,000	99.160	0.780	0.9838	\$245,950	\$243,600	400	2,350	2.56%	0.0031%
SCANA CORP	MIED TERM NOTES	ELEC	2012	230,000	96.340	0.620	0.9372	\$249,200	\$237,750	354	1,330	4.90%	0.0032%
SOUTHWESTERN ELECTRIC POWER CO	SR NOTES, SERIES I	ELEC	2012	275,000	99.720	0.650	0.9707	\$266,943	\$264,900	150	2,042	3.67%	0.0063%
WESTAR ENERGY	1ST MORT BOND	ELEC	2012	310,000	99.914	0.875	0.9804	\$247,598	\$245,200	525	2,338	1.90%	0.0032%
GEORGIA POWER	SR NOTES, SERIES 2012A	ELEC	2012	750,000	99.949	0.875	0.9907	\$743,053	\$733,968	525	7,085	1.87%	0.0084%
CENTURY LINK	SR NOTES, SER. T	TELE	2012	1,400,000	99.842	0.650	0.9919	\$1,388,688	\$1,379,388	9100	9,100	1.46%	0.0117%
MISSISSIPPI POWER	SR NOTES, SERIES 2012A	ELEC	2012	610,000	99.905	0.875	0.9903	\$613,693	\$610,008	3,688	3,688	1.85%	0.0080%
CMS ENERGY	SR NOTES	ELEC	2012	240,000	99.443	0.875	0.9857	\$246,425	\$243,918	370	2,508	2.47%	0.0041%
CONSOLIDATED EDISON OF NY	DEBT SERIES 2012A	ELEC	2012	300,000	99.644	0.875	0.9869	\$296,067	\$292,667	400	3,400	2.44%	0.0045%
SOUTHERN CALIFORNIA EDISON CO.	1ST & REF MORT BONDS SER 2012A	ELEC	2012	400,000	98.818	0.875	0.9794	\$391,076	\$391,076	500	4,000	2.23%	0.0060%
DUKE ENERGY INDIANA	1ST MORT BONDS, SER LLL	ELEC	2012	240,000	99.814	0.875	0.9894	\$247,348	\$244,810	825	4,325	3.14%	0.0034%
GREAT PLAINS ENERGY	NOTES	ELEC	2012	287,386	102.291	0.650	1.0164	\$292,102	\$290,214	250	1,838	-0.99%	-0.0019%
SAN DIEGO GAS & ELEC	1ST MORT BONDS, SERIES MIMI	GAS	2012	310,000	99.481	0.875	0.9861	\$246,415	\$244,078	250	1,838	-0.99%	-0.0019%
PNACIFIC	NOTES	GAS	2012	500,000	100.000	3.150	0.9685	\$484,250	\$467,700	800	16,450	6.46%	0.0217%
IDAHO POWER CO.	SR NOTES	TELE	2012	400,000	99.491	0.875	0.9918	\$391,284	\$387,897	715	4,235	2.44%	0.0066%
CONSUMERS ENERGY CO	1ST MORT BONDS	ELEC	2012	75,000	99.829	0.650	0.9902	\$74,384	\$73,897	488	488	1.47%	0.0067%
GEORGIA POWER	SR NOTES, SERIES 2012B	ELEC	2012	375,000	99.991	0.650	0.9934	\$372,329	\$369,691	400	2,838	1.42%	0.0036%
FLORIDA POWER & LIGHT CO.	SR NOTES, SERIES 2012A	ELEC	2012	350,000	101.208	0.875	1.0033	\$356,708	\$351,738	370	2,970	1.57%	0.0042%
WESTAR ENERGY	1ST MORT BONDS	ELEC	2012	600,000	98.860	0.875	0.9799	\$587,910	\$587,758	345	3,401	6.44%	0.0015%
GULF POWER	SR NOTES	ELEC	2012	300,000	99.451	0.875	0.9838	\$294,728	\$293,953	150	2,775	2.35%	0.0047%
PROGRESS ENERGY CAROLINAS, INC	1ST MORT BONDS	ELEC	2012	100,000	99.811	0.650	0.9916	\$99,163	\$98,259	254	964	1.74%	0.0012%
PROGRESS ENERGY CAROLINAS, INC	1ST MORT BONDS	ELEC	2012	300,000	99.773	0.650	0.9913	\$295,547	\$293,537	650	3,900	1.66%	0.0036%
TAMPA ELECTRIC CO	NOTES	ELEC	2012	300,000	99.754	0.875	0.9855	\$296,547	\$295,625	385	5,025	2.38%	0.0030%
SOUTHWESTERN PUBLIC SERVICE CO	1ST MORT BONDS, SERIES NO. I	ELEC	2012	100,000	110.058	0.875	1.0918	\$107,878	\$107,878	430	3,300	-7.88%	-0.0031%
OWEST	SR NOTES	ELEC	2012	400,000	99.668	0.650	0.9902	\$396,072	\$393,197	275	2,875	1.70%	0.0046%
DETROIT EDISON	2012 SER A GEN & REF MORT BONDS	ELEC	2012	400,000	100.000	3.150	0.9683	\$387,400	\$374,798	2	12,602	6.30%	0.0169%
DELTA POWER & LIGHT CO.	1ST MORT BONDS	ELEC	2012	250,000	99.834	0.875	0.9919	\$247,985	\$246,360	2	1,635	1.46%	0.0024%
IDAHO POWER CO.	1ST MORT BONDS	ELEC	2012	350,000	99.449	0.875	0.9857	\$346,725	\$344,538	2,188	2,188	2.19%	0.0037%
SCE&G	1ST MORT BONDS	ELEC	2012	75,000	99.914	0.750	0.9918	\$74,348	\$73,876	350	553	1.57%	0.0008%
NORTHERN STATES POWER CO.	1ST MORT BONDS	ELEC	2012	350,000	108.628	0.875	1.0773	\$369,383	\$366,725	470	2,638	-6.69%	-0.0112%
NORTHERN STATES POWER CO.	1ST MORT BONDS	ELEC	2012	300,000	99.848	0.650	0.9920	\$297,594	\$294,194	1450	3,400	1.94%	0.0049%
FROTHIER COMMUNICATIONS CORP	SR NOTE	TELE	2012	500,000	99.236	0.875	0.9816	\$491,805	\$485,980	1450	5,823	2.80%	0.0094%
AMEREN ILLINOIS	SR NOTES, SERIES 2012A	ELEC	2012	600,000	100.000	1.875	0.9813	\$588,750	\$576,800	700	11,950	3.87%	0.0156%
SEN SEC NOTES	SR SEC NOTES	ELEC	2012	400,000	104.826	0.875	1.0193	\$397,902	\$205,828	294	2,044	-2.91%	-0.0039%
PACIFIC GAS & ELECTRIC CO	1ST MORT BONDS, SER NO 23	GAS	2012	400,000	99.964	0.650	0.9906	\$392,236	\$394,336	300	2,900	1.41%	0.0038%
PACIFIC GAS & ELECTRIC CO	1ST MORT BONDS, SER NO 24	GAS	2012	400,000	99.709	0.650	0.9906	\$396,236	\$392,936	300	3,100	1.77%	0.0047%
BALTIMORE GAS & ELECTRIC CO.	NOTES	GAS	2012	350,000	99.911	0.875	0.9897	\$347,425	\$345,400	400	2,025	1.84%	0.0031%
AMEREN MISSOURI	1ST MORT BONDS	ELEC	2012	250,000	99.663	0.650	0.9902	\$247,538	\$245,513	400	2,025	1.80%	0.0031%
DOMINION RESOURCES, INC	SR SEC NOTES	ELEC	2012	485,000	99.477	0.875	0.9860	\$478,220	\$473,676	300	4,544	2.33%	0.0076%
DOMINION RESOURCES, INC	SR NOTES, SERIES B	ELEC	2012	350,000	99.392	0.650	0.9934	\$347,694	\$345,262	137	2,412	1.35%	0.0032%
PECO ENERGY CORP	SR NOTES, SERIES C	ELEC	2012	350,000	99.392	0.650	0.9926	\$347,694	\$345,262	137	2,412	1.35%	0.0032%
PE&G	1ST & REF MORT BONDS	ELEC	2012	350,000	99.312	0.650	0.9926	\$347,694	\$345,262	137	2,412	1.35%	0.0032%
TILSCO ELECTRIC POWER CO	SEC MED TERM NOTES, SER H	ELEC	2012	350,000	99.513	0.750	0.9876	\$345,671	\$344,642	500	2,775	1.53%	0.0036%
DUKE ENERGY CAROLINAS	1ST & REF MORT BONDS	ELEC	2012	190,000	99.675	0.650	0.9903	\$188,518	\$187,288	275	1,340	1.81%	0.0018%
SEMpra ENERGY	NOTES	ELEC	2012	650,000	99.264	0.875	0.9833	\$639,139	\$632,639	812	6,500	2.67%	0.0116%
SYSTEM ENERGY RESOURCES, INC	1ST MORT BONDS	GAS	2012	500,000	99.965	0.650	0.9932	\$496,574	\$493,073	250	3,500	1.39%	0.0046%
FRONTIER COMMUNICATIONS CORP	SR NOTE	ELEC	2012	250,000	99.813	0.650	0.9916	\$247,908	\$245,748	533	2,160	1.70%	0.0029%
FRONTIER SERVICE CO OF COLORADO	1ST MORT BONDS, SER. 23	TELE	2012	310,000	104.230	1.750	1.0230	\$326,250	\$291,475	400	4,775	-0.59%	-0.0010%
PUBLIC SERVICE CO OF COLORADO	1ST MORT BONDS, SER. 24	ELEC	2012	300,000	99.902	0.650	0.9923	\$297,756	\$295,106	700	2,650	1.63%	0.0031%
			2012	500,000	99.654	0.875	0.9878	\$493,895	\$488,830	700	5,073	2.44%	0.0073%



ISSUER	DESCRIPTION	DATE	TYPE	AMOUNT	YIELD	PRICE	PERIOD	YIELD
DUKE ENERGY INDIANA	SR NOTES	2013	ELEC	400,000	99.795	\$396,380	0.9915	3,100
PSEG	SR NOTES	2013	ELEC	230,000	99.943	\$248,233	0.9929	700
APPALACHIAN CONSUMER RATE RELIEF FUNDING	SR, SEC CONSUMER RATE RELIEF BOND	2013	ELEC	215,800	100.000	\$214,936	0.9960	1,542
APPALACHIAN CONSUMER RATE RELIEF FUNDING	SR, SEC CONSUMER RATE RELIEF BOND	2013	ELEC	164,500	99.990	\$163,825	0.9959	1,870
KENTUCKY UTILITIES CO	1ST MORT BONDS	2013	ELEC	240,000	99.280	\$246,013	0.9841	2,688
LOUISVILLE GAS & ELECT CO	1ST MORT BONDS	2013	ELEC	250,000	99.280	\$246,013	0.9841	2,688
PACIFIC GAS & ELECT CO	SR NOTES	2013	ELEC	300,000	99.819	\$297,207	0.9917	302
PACIFIC GAS & ELECT CO	SR NOTES	2013	ELEC	500,000	99.847	\$494,160	0.9897	818
PUBLIC SERVICE CO OF NEW HAMPSHIRE	1ST MORT BONDS, SER B	2013	ELEC	250,000	99.610	\$247,460	0.9859	471
DELMARVA POWER	1ST MORT BONDS	2013	ELEC	300,000	99.958	\$297,924	0.9931	625
POTOMAC ELECTRIC POWER CO	1ST MORT BONDS	2013	ELEC	150,000	99.259	\$147,576	0.9838	390
BLACK HILLS CORP	NOTES	2013	ELEC	523,000	99.350	\$519,120	0.9888	1,703
WISCONSIN PUBLIC SERVICE CORP	SR NOTES	2013	ELEC	450,000	100.000	\$446,063	0.9913	458
DTE ELECTRIC CO	2013 SER. F SR. NOTES	2013	ELEC	300,000	99.785	\$297,403	0.9914	650
ALABAMA POWER CO.	SR NOTES, SER 2013A	2013	ELEC	300,000	99.717	\$294,105	0.9907	350
AMEREN UTILITIES	SR SECURED NOTES	2013	ELEC	260,000	99.464	\$276,049	0.9859	359
SEMpra ENERGY	NOTES	2013	GAS	300,000	99.665	\$294,892	0.9875	359
NISOURCE FINANCE	NOTES	2013	GAS	300,000	99.665	\$294,892	0.9875	359
NORTHWEST NATURAL GAS CO	SEC MED TERM NOTES, SER B	2013	GAS	50,000	99.311	\$49,330	0.9847	150
PEDHONAT NATURAL GAS CO	SR NOTES	2013	GAS	300,000	99.952	\$297,231	0.9938	300
AGI CAPITAL	SR NOTES	2013	GAS	300,000	99.618	\$293,715	0.9874	2,925
AT&T	SR NOTES	2013	GAS	300,000	99.812	\$294,685	0.9874	4,700
AT&T	GLOBAL NOTES	2013	TELE	1,625,625	99.790	\$1,616,522	0.9944	2,200
AT&T	GLOBAL NOTES	2013	TELE	570,200	99.667	\$566,075	0.9921	6,140
FRONTIER COMAI CORP	SR NOTES	2013	TELE	750,000	100.000	\$736,875	0.9825	1,320
QWEST	GLOBAL NOTES	2013	TELE	1,560,500	99.177	\$1,541,415	0.9878	3,610
CENTURY LINK	SR NOTES, SER. W	2013	TELE	750,000	100.000	\$720,375	0.9885	10,163
COMMONWEALTH EDISON CO	1ST MORT BONDS, SER 110	2013	TELE	749,999	1.000	\$734,499	0.9900	8,000
NORTHERN STATES POWER CO	1ST MORT BONDS	2014	ELEC	350,000	99.967	\$342,769	0.9909	2,070
ARIZONA PUBLIC SERVICE CO	NOTES	2014	ELEC	100,000	99.647	\$98,997	0.9899	4,063
VIRGINIA ELECTRIC & POWER CO	SR NOTES, SER A	2014	ELEC	350,000	99.798	\$344,121	0.9873	1,350
WIRGINIA ELECTRIC & POWER CO	SR NOTES, SER B	2014	ELEC	400,000	99.212	\$393,348	0.9913	2,692
PACIFIC GAS & ELECTRIC CO	SR NOTES	2014	ELEC	450,000	99.501	\$442,855	0.9914	1,667
PACIFIC GAS & ELECTRIC CO	SR NOTES	2014	ELEC	450,000	99.571	\$442,855	0.9914	1,667
CMS ENERGY CORP	SR NOTES	2014	ELEC	250,000	99.926	\$248,190	0.9938	2,775
CMS ENERGY CORP	SR NOTES	2014	ELEC	300,000	99.811	\$296,808	0.9894	1,350
PUBLIC SERVICE CO OF COLORADO	1ST MORT BONDS, SER #27	2014	ELEC	300,000	99.631	\$296,268	0.9875	2,370
COMMONWEALTH EDISON OF NY	DEBENTURES, SERIES 2014 A	2014	ELEC	850,000	99.916	\$841,849	0.9904	8,788
NSTAR ELECTRIC COMPANY	DEBT	2014	ELEC	300,000	99.309	\$295,302	0.9843	3,145
TUCSON ELECTRIC POWER CO	NOTES	2014	ELEC	150,000	99.445	\$147,855	0.9875	1,470
ENERGY ARKANSAS	1ST MORT BONDS	2014	ELEC	375,000	99.928	\$372,293	0.9928	3,038
PACIFICORP	1ST MORT BONDS	2014	ELEC	425,000	99.940	\$422,110	0.9932	1,330
PEPCO	1ST MORT BONDS	2014	ELEC	400,000	99.867	\$396,868	0.9922	3,425
ENERGY ANTISSIPPI	1ST MORT BONDS	2014	ELEC	100,000	99.970	\$99,370	0.9932	6,100
OKLAHOMA GAS & ELECT CO	SR NOTES	2014	ELEC	230,000	99.677	\$231,318	0.9880	2,310
MIDAMERICAN ENERGY CO	1ST MORT BONDS	2014	ELEC	300,000	99.511	\$296,583	0.9886	970
MIDAMERICAN ENERGY CO	1ST MORT BONDS	2014	ELEC	400,000	99.399	\$394,096	0.9852	2,683
DUKE ENERGY	SR NOTES	2014	ELEC	600,000	99.941	\$595,746	0.9959	1,991
AMEREN MISSOURI	SEN SEC NOTES	2014	ELEC	350,000	99.982	\$347,662	0.9933	2,550
CONNECTICUT LIGHT AND POWER CO	1ST AND REFUNDING MORT BONDS, 2014 SERIES	2014	ELEC	250,000	100.000	\$244,887	0.9913	1,485
APPALACHIAN PWER CO	SR NOTES, SERIES U	2014	ELEC	300,000	99.709	\$293,166	0.9913	2,775
NORTHERN STATES POWER CO	1ST MORT BONDS	2014	ELEC	300,000	99.306	\$295,293	0.9843	3,100
FLORIDA POWER & LIGHT CO	1ST MORT BONDS	2014	ELEC	500,000	99.871	\$496,105	0.9922	2,609
ENERGY TEXAS INC	1ST MORT BONDS	2014	ELEC	300,000	99.933	\$292,177	0.9922	4,325
WESTAR ENERGY	1ST MORT BONDS	2014	ELEC	350,000	99.933	\$340,455	0.9922	2,400
DTE ENERGY COMPANY	1ST MORT BONDS	2014	ELEC	125,000	100.000	\$120,748	0.9906	3,650
SOUTH CAROLINA ELECTRIC & GAS CO	SR NOTES, SERIES C	2014	ELEC	180,000	96.675	\$172,440	0.9580	4,728
PPL ELECTRIC UTILITY CORP	1ST MORT BONDS	2014	ELEC	300,000	99.918	\$294,189	0.9886	3,020
SOUTHWESTERN PUBLIC SERVICE CO	1ST MORT BONDS	2014	ELEC	300,000	99.827	\$299,836	0.9795	3,235
OGLETHORPE POWER CO	1ST MORT BONDS, SER #3	2014	ELEC	150,000	99.670	\$148,530	0.9902	3,625
ARIZONA PUBLIC SERVICE CO	NOTES	2014	ELEC	250,000	99.370	\$246,238	0.9830	1,875
WISCONSIN ELECTRIC POWER CO	DEBENTURES	2014	ELEC	250,000	99.908	\$248,145	0.9956	3,083
WISCONSIN ELECTRIC POWER CO	DEBENTURES	2014	ELEC	250,000	99.376	\$246,233	0.9850	2,788







# **EXHIBIT G**

## **Bond Ratings**



Wyoming Department of Revenue  
Netback Return on Investment Calculation  
Bond Ratings  
Production Year: 2017

Company Name	Standard & Poors	Moody's
Anadarko Petroleum	BBB	Ba1
BP p.l.c.	A-	A1
Chesapeake Energy	B-	B3
Chevron Corp	AA-	Aa2
Conoco Philips	A-	Baa1
Devon Energy	BBB	Ba1
Encana Corp	BBB	Ba2
EOG Resources	BBB+	Baa1
ExxonMobil	AA+	Aaa
QEP Resources Inc.	BB+	Ba3

Note: The source of Moody's credit rating the Moody's website [www.moodys.com](http://www.moodys.com). The source of the Standard and Poor's credit rating from the Standard and Poor's website [www.standardandpoors.com](http://www.standardandpoors.com). All information current as of February 13, 2018.

**LONG TERM DEBT (30 Year Industrial Bond Yields)**

	<b><u>AA+</u></b>	<b><u>AA-</u></b>	<b><u>A+</u></b>	<b><u>A-</u></b>	<b><u>BBB+</u></b>	<b><u>BBB</u></b>	<b><u>BB+</u></b>	<b><u>B-</u></b>	<b><u>Weighted Avg.Hi&amp;Lo</u></b>
	3.450%	4.030%	4.523%	4.662%	4.878%	6.169%	9.903%	5.1892%	