BEFORE THE

WASHINGTON UTILITIES & TRANSPORTATION COMMISSION

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GENERAL RATE APPLICATION

OF

NORTHWEST NATURAL GAS COMPANY

MARCH 28, 2008

Direct Testimony of Samuel C. Hadaway:

Return on Equity

RETURN ON EQUITY TESTIMONY

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I. Introduction

Q. Please state your name, occupation, and business address.

A. My name is Samuel C. Hadaway. I am a Principal in FINANCO, Inc., Financial Analysis Consultants, 3520 Executive Center Drive, Austin, Texas 78731.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of Northwest Natural Gas Company (NW Natural or the Company).

II. Purpose and Summary of Testimony

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to estimate the market required rate of return on equity (ROE) for NW Natural.

Q. Please state your ROE recommendation and summarize your cost of equity studies.

A. I recommend an ROE of 10.65 percent. In my ROE analysis, I first apply the discounted cash flow (DCF) model to a comparable group of investment grade natural gas local distribution companies (LDCs). This approach is appropriate because it provides a statistically sound estimate of ROE and it is consistent with the United States Supreme Court's holdings in the *Bluefield* and *Hope* cases, as discussed later in my testimony. I begin my DCF analysis by reviewing the data for all the LDCs that are included in the *Value Line Investment Survey* (Value Line). Value Line is a widely-followed, reputable source of financial data often

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used by professional economists to estimate the cost of capital for utilities. This sample is appropriate because NW Natural has business and financial risk characteristics similar to these companies.

I applied additional filters to improve comparability with NW Natural. The comparable companies were required to have at least a triple-B bond rating from Standard & Poor's or Moody's and obtain at least 50 percent of their revenues from domestic regulated utility sales. In addition to the fundamental risk filters, the comparable companies were also required to have consistent data from Value Line with no dividend cuts in the past two years and no extraordinary financial effects such as subsidiary bankruptcies or current merger activities. This process resulted in a comparable group with average bond ratings of A3 to Baa1 from Moody's and single-A from S&P. As such, the comparable companies are a financially sound group of LDCs that are representative of the natural gas distribution business. The fundamental characteristics of my comparable group are summarized in *Exhibit No.___ (SCH-2)*.

To test my DCF results, I compare them to risk premium estimates of ROE. I calculate equity risk premiums by subtracting *Moody's* average cost of utility debt from the average rates of return allowed for LDCs. I then add the risk premiums to Moody's single-A cost of utility debt. This is an appropriate basis for the risk premium analysis since NW Natural's senior debt is rated single-A (A2) by Moody's and double-A minus (AA-) by S&P. Under current market conditions, this combination approach based on the DCF and risk premium

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models is the most reliable method for estimating the Company's cost of equity capital. The data sources and the details of my rate of return analysis are contained in *Exhibit No.___ (SCH-2* through *SCH-7)*, and in my workpapers, which are filed in this proceeding.

Given the continuing capital market turmoil and the volatility of energy markets affecting providers of energy services, I believe that 10.65 percent ROE is an extremely conservative estimate of NW Natural's cost of equity capital.

Q. How is the remainder of your testimony organized?

A. My testimony is divided into four additional sections. In Section III, I review various methods for estimating the cost of equity. In this section, I discuss comparable earnings methods, risk premium methods, and discounted cash flow DCF methods. In Section IV, I review general capital market costs and conditions and discuss recent developments in the gas utility industry that may affect the cost of capital. In Section V, I present the details of my cost of equity studies. In Section VI, I provide a brief summary table from my analyses and a statement of my conclusions.

III. Estimating the Cost of Equity

Q. What is the purpose of this section of your testimony?

A. The purpose of this section is to present a general definition of the cost of equity and to compare the strengths and weaknesses of several of the most widely used methods for estimating the cost of equity. Estimating the cost of equity is fundamentally a matter of informed judgment. The various models provide a

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concrete link to actual capital market data and assist with defining the various relationships that underlie the ROE estimation process.

Q. Please define the term "cost of equity capital" and provide an overview of the cost estimation process.

A. The cost of equity capital is the profit or rate of return that equity investors expect to receive. In concept it is no different than the cost of debt or the cost of preferred stock. The cost of equity is the rate of return that common stockholders expect, just as interest on bonds and dividends on preferred stock are the returns that investors in those securities expect. Equity investors expect a return on their capital commensurate with the risks they take and consistent with returns that might be available from other similar investments. Unlike returns from debt and preferred stocks, however, the equity return is not directly observable in advance and, therefore, it must be estimated or inferred from capital market data and trading activity.

An example helps to illustrate the cost of equity concept. Assume that an investor buys a share of common stock for $20 per share. If the stock's expected dividend during the coming year is $1.00, the expected dividend yield is 5.0 percent ($1.00 / $20 = 5.0%). If the stock price is also expected to increase to $21.25 after one year, this $1.25 expected gain adds an additional 6.25 percent to the expected total rate of return ($1.25 / $20 = 6.25%). Therefore, buying the stock at $20 per share, the investor expects a total return of 11.25 percent: 5.0 percent dividend yield, plus 6.25 percent price appreciation. In this

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example, the total expected rate of return at 11.25 percent is the appropriate measure of the cost of equity capital, because it is this rate of return that caused the investor to commit the $20 of equity capital in the first place. If the stock were riskier, or if expected returns from other investments were higher, investors would have required a higher rate of return from the stock, which would have resulted in a lower initial purchase price in market trading.

Each day market rates of return and prices change to reflect new investor expectations and requirements. For example, when interest rates on bonds and savings accounts rise, utility stock prices usually fall. This is true, at least in part, because higher interest rates on these alternative investments make utility stocks relatively less attractive, which causes utility stock prices to decline in market trading. This competitive market adjustment process is quick and continuous, so that market prices generally reflect investor expectations and the relative attractiveness of one investment versus another. In this context, to estimate the cost of equity one must apply informed judgment about the relative risk of the company in question and knowledge about the risk and expected rate of return characteristics of other available investments as well.

Q. Why are utilities entitled to a rate of return?

A. Because utilities are generally monopolies and hence not subject to the competition provided in an open market, state regulatory commissions are tasked with the responsibility of fixing just and reasonable rates. That process involves the balancing of two competing interests. As explained in the *Hope*

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case, regulators must balance the interest of the investors and the consumer's interest. In considering the interest of the investors, a utility's allowed return is used for two purposes. Return dollars are first used to pay interest on debt. For the utility to raise capital to finance replacement and new plant and equipment, it must have adequate return dollars to assure lenders that they will be paid. This requirement is directly reflected in the *Bluefield and Hope* standards. The return dollars left after interest is paid may be used to pay dividends to shareholders or they may be reinvested in the utility. The return left for shareholders, as dividends or reinvestment, must be adequate to attract new equity capital when needed. In both *Bluefield and Hope*, this requirement is reflected in the statement that utility's return must be adequate to attract additional capital. In sum, utilities must be provided an opportunity to earn a return so that interest on debt can be paid and access to equity capital markets can be maintained. This, in turn, allows the utility to provide safe and reliable service to its customers.

Q. How does the market account for risk differences among the various investments?

A. Risk-return tradeoffs among capital market investments have been the subject of extensive financial research. Literally dozens of textbooks and hundreds of academic articles have addressed the issue. Generally, such research confirms the common sense conclusion that investors will take additional risks only if they expect to receive a higher rate of return. Empirical tests consistently show that returns from low risk securities, such as U.S. Treasury bills, are the lowest; that

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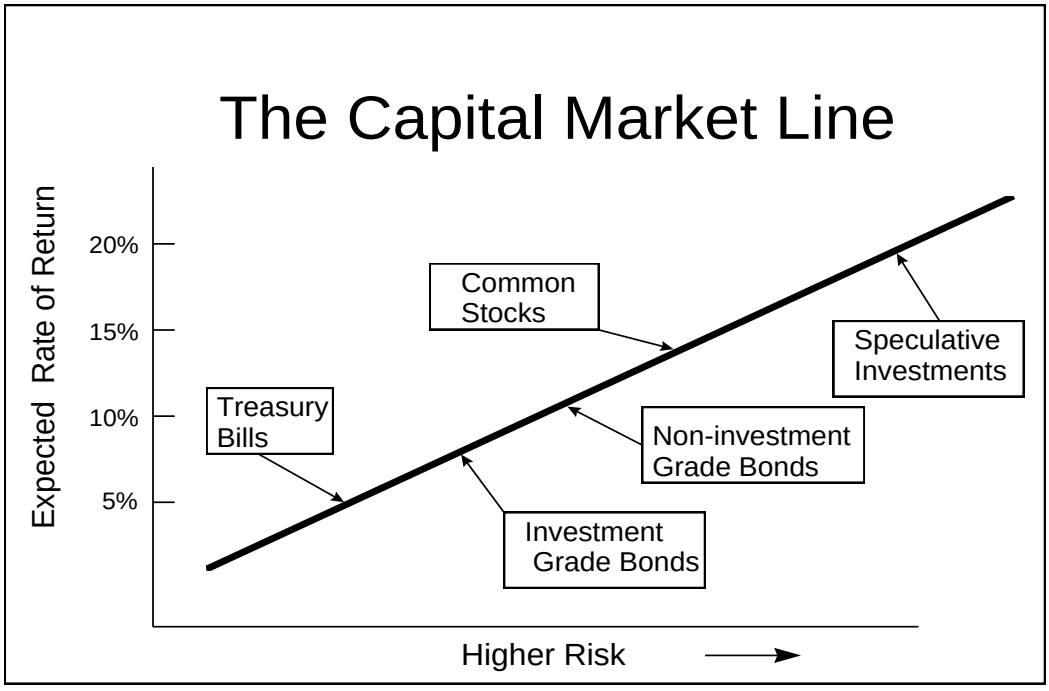
returns from longer-term Treasury bonds and corporate bonds are increasingly higher as risks increase; and generally, returns from common stocks and other more risky investments are even higher. These observations provide a sound theoretical foundation for both the DCF and risk premium methods for estimating the cost of equity capital. These methods attempt to capture the well-founded risk-return principle and explicitly measure investors' rate of return requirements.

Q. Can you illustrate the capital market risk-return principle that you just described?

A. Yes. The following graph depicts the risk-return relationship that has become widely known as the Capital Market Line (CML). The CML offers a graphical

Risk-Return Tradeoffs



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representation of the capital market risk-return principle. The graph is not meant to illustrate the actual expected rate of return for any particular investment, but merely to illustrate in a general way the risk-return relationship.

As a continuum, the CML can be viewed as an available opportunity set for investors. Those investors with low risk tolerance or investment objectives that mandate a low risk profile should invest in assets depicted in the lower left-hand portion of the graph. Investments in this area, such as Treasury bills and short-maturity, high quality corporate commercial paper, offer a high degree of investor certainty. In nominal terms (before considering the potential effects of inflation), such assets are virtually risk-free.

Investment risks increase as one moves up and to the right along the CML. A higher degree of uncertainty exists about the level of investment value at any point in time and about the level of income payments that may be received. Among these investments, long-term bonds and preferred stocks, which offer priority claims to assets and income payments, are relatively low risk, but they are not risk-free. The market value of long-term bonds, even those issued by the U.S. Treasury, often fluctuates widely when government policies or other factors cause interest rates to change.

Farther up the CML continuum, common stocks are exposed to even more risk, depending on the nature of the underlying business and the financial strength of the issuing corporation. Common stock risks include market-wide factors, such as general changes in capital costs, as well as industry and

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company specific elements that may add further to the volatility of a given company's performance. As I will illustrate in my risk premium analysis, common stocks typically are more volatile (have higher risk) than high quality bond investments and, therefore, they reside above and to the right of bonds on the CML graph. Other more speculative investments, such as stock options and commodity futures contracts, offer even higher risks (and higher potential returns). The CML's depiction of the risk-return tradeoffs available in the capital markets provides a useful perspective for estimating investors' required rates of return.

Q. How is the fair rate of return in the regulatory process related to the estimated cost of equity capital?

A. As discussed above, the regulatory process is guided by fair rate of return principles established in the U.S. Supreme Court cases of *Bluefield* and *Hope*. In those opinions, the Court stated:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. *Bluefield Water Works & Improvement Company v. Public Service Commission of West Virginia*, 262 U.S. 679, 692 693 (1923).
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> From the investor or company point of view, it is important that there be enough revenue not only for operating expenses, but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard the return to

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> the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. *Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944).*

Based on these principles, the fair rate of return should closely parallel investor opportunity costs as discussed above. If a utility earns its market cost of equity, neither its stockholders nor its customers should be disadvantaged.

Q. What specific methods and capital market data are used to evaluate the cost of equity?

A. Techniques for estimating the cost of equity normally fall into three groups: comparable earnings methods, risk premium methods, and DCF methods. Comparable earnings methods have evolved over time. The original comparable earnings methods were based on book accounting returns. This approach developed ROE estimates by reviewing accounting returns for unregulated companies thought to have risks similar to those of the regulated company in question. These methods generally have been rejected because they assume that the unregulated group is earning its actual cost of capital, and that its equity book value is the same as its market value. In most situations these assumptions are not valid, and, therefore, accounting-based methods generally do not provide reliable cost of equity estimates.

More recent comparable earnings methods are based on historical stock market returns rather than book accounting returns. While this approach has

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some merit, it too has been criticized because there can be no assurance that historical returns actually reflect current or future market requirements. Also, in practical application, earned market returns tend to fluctuate widely from year to year. For these reasons, a current cost of equity estimate (based on the DCF model or a risk premium analysis) is usually required.

The second set of estimation techniques is grouped under the heading of risk premium methods. These methods begin with currently observable market returns, such as yields on government or corporate bonds, and add an increment to account for the additional equity risk. The capital asset pricing model (CAPM) and arbitrage pricing theory (APT) model are more sophisticated risk premium approaches. The CAPM and APT methods estimate the cost of equity directly by combining the "risk-free" government bond rate with explicit risk measures to determine the risk premium required by the market. Although these methods are widely used in academic cost of capital research, their additional data requirements and their potentially questionable underlying assumptions have detracted from their use in most regulatory jurisdictions. Also, recent anomalies in the market for U.S. Treasury securities, which are used as a proxy for the CAPM “risk-free rate” have raised further questions about that model’s current applicability. The straightforward bond yield plus risk premium approach provides a useful parallel for the DCF model, however, and it assures consistency with other capital market data in estimates of the cost of equity.

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The DCF model is the most widely used approach in regulatory proceedings. Like the risk premium method, the DCF model has a sound basis in theory, and many argue that it has the additional advantage of simplicity. I will describe the DCF model in detail below, but in essence its estimate of ROE is simply the sum of the expected dividend yield and the expected long-term dividend (or price) growth rate. While dividend yields are readily available, long-term growth estimates are more difficult to obtain. Because the constant growth DCF model requires very long-term growth estimates (technically to infinity), some argue that its application is subjective and that more explicit multistage growth DCF models are preferred. In the final analysis, ROE estimates are subjective and should be based on sound, informed judgment. To accomplish this task, I apply several versions of the DCF and risk premium models, which results in an ROE range that I believe brackets the fair cost of equity capital.

Q. Please explain the DCF model.

A. The DCF model is predicated on the concept, or in fact, the definition that a stock's price represents the present value of all future cash flows expected from the stock. In the most general form, the model is expressed in the following formula:

$$P_0 = D_1/(1+k) + D_2/(1+k)^2 + ... + D_\infty/(1+k)^\infty \qquad (1)$$

where P_0 is today's stock price; D_1, D_2, etc. are all expected future dividends and k is the discount rate, or the investor's required rate of return on

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equity. Equation (1) is a routine present value calculation with the difficult data requirement of estimating all future dividends.[1]

Under the additional assumption that dividends are expected to grow at a constant rate "g," equation (1) can be solved for k and rearranged into the simple form:

$$k = D_1/P_0 + g \qquad (2)$$

Equation (2) is the familiar constant growth DCF model for cost of equity estimation, where D_1/P_0 is the expected dividend yield and g is the long-term expected dividend growth rate.

Under circumstances when growth rates are expected to fluctuate or when future growth rates are highly uncertain, the constant growth model may be questionable, and explicit changing growth estimates may be required. Although the DCF model itself is still valid [equation (1) is mathematically correct], under the assumption of fluctuating growth the simplified form of the model must be modified to capture market expectations accurately.

Q. How is the DCF model applied when the growth rates fluctuate?

A. When growth rates are expected to fluctuate, the more general version of the model represented in equation (1) should be solved explicitly over a finite "transition" period while uncertainty prevails. The constant growth version of the model can then be applied after the transition period, under the assumption that

1 As a practical matter, the present value of dividends expected in the very distant future is typically insignificant, and operationally the DCF model can be reasonably estimated by discounting a finite dividend

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more stable conditions will prevail in the future. There are two alternatives for dealing with the non-constant growth transition period.

Under the "Market Price" version of the DCF model, equation (1) is written in a slightly different form:

$$P_0 = D_1/(1+k) + D_2/(1+k)^2 + ... + P_T/(1+k)^T \quad (3)$$

where the variables are the same as in equation (1) except that P_T is the estimated Market Price at the end of the transition period T. Under the assumption that constant growth resumes after the transition period, the price P_T is then expected to be based on constant growth assumptions. As with the general form of the DCF model in equation (1), in the Market Price approach the current stock price (P_0) is the present value of expected cash inflows, but the cash flows are comprised of dividends and an ultimate selling price for the stock. The estimated cost of equity, k, is just the rate of return that investors would expect if they bought the stock at today's price, held it and received dividends through the transition period (until period T), and then sold it for price P_T.

Under the "Multistage" growth DCF approach, equation (1) is expanded to incorporate two or more growth rate periods, with the assumption that a permanent constant growth rate can be estimated for some point in the future:

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stream, or with the assumption that the stock will be sold for some estimated price in the foreseeable future.

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$$P_0 = D_0(1+g_1)/(1+k) + ... + D_0(1+g_2)^n/(1+k)^n + ... + D_0(1+g_T)^{(T+1)}/(k-g_T) \quad (4)$$

where the variables are the same as in equation (1), but g_1 represents the growth rate for the first period, g_2 for a second period, and g_T for the period from year T (the end of the transition period) to infinity. The first two growth rates are estimates of fluctuating growth over "n" years (typically 5 or 10 years) and g_T is a constant growth rate assumed to prevail forever after year T.

Although less convenient for exposition purposes, the non-constant growth models are based on the same valid capital market assumptions as the constant growth version. The non-constant growth approach simply requires more explicit data inputs and more work to solve for the discount rate, k. Fortunately, the required data are generally available from investment and economic forecasting services, and computer algorithms can easily produce the required solutions. Both constant and non-constant growth DCF analyses are presented in the following section.

Q. Please explain the risk premium methodology.

A. Risk premium methods are based on the assumption that equity securities are riskier than debt and, therefore, that equity investors require a higher rate of return. This basic premise is well supported by legal and economic distinctions between debt and equity securities, and it is widely accepted as a fundamental capital market principle. For example, debt holders' claims to the earnings and assets have priority over all claims of equity investors. The contractual interest

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on mortgage debt generally must be paid in full before any dividends can be paid to shareholders, and secured mortgage claims must be fully satisfied before any assets can be distributed to shareholders in bankruptcy. Also, the guaranteed, fixed-income nature of interest payments on debt makes year-to-year returns from bonds typically more stable than capital gains and dividend payments on stocks. All these factors support the proposition that stockholders are exposed to more risk and that shareholders should reasonably expect a positive equity risk premium.

Q. Are risk premium estimates of the cost of equity consistent with other current capital market costs?

A. Yes. The risk premium approach is especially useful because it is founded on current market interest rates, which are directly observable. This feature assures that risk premium estimates of the cost of equity begin with a sound basis, which is tied directly to current capital market costs.

Q. Is there similar consensus about how risk premium data should be employed?

A. No. In regulatory practice, there is often considerable debate about how risk premium data should be interpreted and used. Since the analyst's basic task is to gauge investors' required returns on long-term investments, some argue that the estimated equity spread should be based on the longest possible time period. Others argue that market relationships between debt and equity from several decades ago are irrelevant and that recent debt-equity observations

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should be given more weight in estimating investor requirements. There is no consensus on this issue. Since analysts cannot observe or measure investors' actual expectations, it is not possible to know exactly how such expectations are formed or, therefore, exactly what time period is most appropriate in a risk premium analysis.

The important question to answer is the following: "What rate of return should equity investors reasonably expect relative to returns currently available from long-term bonds?" The risk premium studies and analyses I discuss in Section V address this question. My risk premium recommendation is based on an intermediate position that avoids some of the problems and concerns that have been expressed about both very long and very short periods of analysis with the risk premium model.

Q. Please summarize your discussion of cost of equity estimation techniques.

A. Estimating the cost of equity is a controversial issue in utility ratemaking. Because actual investor requirements are not directly observable, analysts have developed several methods to assist in the process. The comparable earnings method is the oldest but perhaps least reliable. Its use of accounting rates of return, or even historical market returns, may or may not reflect current investor requirements. Differences in accounting methods among companies and issues of comparability also detract from this approach.

The DCF and market-based risk premium methods are more widely accepted in regulatory practice. I believe that a combination of the DCF model

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and a review of risk premium data provides the most reliable approach. While the DCF model requires judgment about future growth rates, the dividend yield portion of the model is straightforward, and the model's results are generally consistent with actual capital market behavior. For these reasons, I rely principally upon the DCF model, and I test the reasonableness of the DCF results by comparing to ROE estimates from market-based risk premiums.

IV. Fundamental Factors That Affect the Cost of Equity Capital

Q. What is the purpose of this section of your testimony?

A. The purpose of this section is to review recent capital market costs and conditions as well as industry- and Company-specific factors that should be reflected in the cost of equity capital.

Q. What has been the recent experience in the U.S. capital markets?

A. *Exhibit No.___ (SCH-3)*, page 1, provides a review of annual interest rates and rates of inflation in the U.S. economy over the past ten years. During this time, inflation and capital market costs have declined and, generally, have been lower than rates that prevailed in the previous decade. Inflation, as measured by the Consumer Price Index, until 2005 had remained at historically low levels not seen consistently since the early 1960s. Inflation rates for 2005 and 2006 were similar to longer-term historical averages in excess of 3 percent. With improving economic conditions, after mid-2004, the Federal Reserve System (Fed) increased the short-term Federal Funds interest rate 17 times between June 30, 2004 and June 29, 2006, raising it from 1 percent to 5.25 percent. More

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recently, in response to the extreme turbulence in the sub-prime lending markets and fears of recession, the Fed has reduced the Federal Funds rate six times since September 2007, dropping the rate most recently on March 18, 2008 to a level of 2.25 percent. However, long-term corporate interest rates, which are not directly affected by the Fed's short-term rate policies, have not declined significantly and remain well above the lowest levels they reached in mid-2005. Estimates for the coming year are also for improving economic growth and higher long-term interest rates.

Q. How have long-term interest rates changed since mid-2005?

A. The following table provides the month-by-month interest rates paid by utilities and the U.S. Treasury as well as the spreads of utility debt costs over Treasuries:

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Table 1
Long-Term Interest Rate Trends

Month	Single-A Utility Rates	Average Utility Rates	Long-Term Treasury Rates	Single-A Utility to L-T Treasury Spreads
Jun-05	5.40%	5.39%	4.35%	1.05%
Jul-05	5.51%	5.50%	4.48%	1.03%
Aug-05	5.50%	5.51%	4.53%	0.97%
Sep-05	5.52%	5.54%	4.51%	1.01%
Oct-05	5.79%	5.79%	4.74%	1.05%
Nov-05	5.88%	5.88%	4.83%	1.05%
Dec-05	5.80%	5.83%	4.73%	1.07%
Jan-06	5.75%	5.77%	4.65%	1.10%
Feb-06	5.82%	5.83%	4.73%	1.09%
Mar-06	5.98%	5.98%	4.91%	1.07%
Apr-06	6.29%	6.28%	5.22%	1.07%
May-06	6.42%	6.39%	5.35%	1.07%
Jun-06	6.43%	6.41%	5.29%	1.14%
Jul-06	6.39%	6.39%	5.25%	1.14%
Aug-06	6.20%	6.20%	5.08%	1.12%
Sep-06	6.00%	6.02%	4.93%	1.07%
Oct-06	5.98%	6.01%	4.94%	1.04%
Nov-06	5.80%	5.82%	4.78%	1.02%
Dec-06	5.81%	5.83%	4.78%	1.03%
Jan-07	5.96%	5.97%	4.95%	1.01%
Feb-07	5.90%	5.91%	4.93%	0.97%
Mar-07	5.85%	5.87%	4.81%	1.04%
Apr-07	5.97%	6.01%	4.95%	1.02%
May-07	5.99%	6.03%	4.98%	1.01%
Jun-07	6.30%	6.34%	5.29%	1.01%
Jul-07	6.25%	6.28%	5.19%	1.06%
Aug-07	6.24%	6.29%	5.00%	1.24%
Sep-07	6.18%	6.24%	4.84%	1.34%
Oct-07	6.11%	6.17%	4.83%	1.28%
Nov-07	5.97%	6.04%	4.56%	1.41%
Dec-07	6.16%	6.23%	4.57%	1.59%
Jan-08	6.02%	6.08%	4.35%	1.67%
Feb-08	6.22%	6.29%	4.37%	1.85%

Sources: Mergent Bond Record (Utility Rates);
www.federalreserve.gov (Treasury Rates).

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The data in Table 1 show that long-term utility interest rates are 60 to 80 basis points higher than they were in mid-2005. Long-term borrowing costs for single-A rated utilities increased from 5.40 percent to 6.22 percent during this period. While "flight to safety" issues, due to the sub-prime credit crisis, have reduced Treasury rates from the higher levels reached in 2006 and 2007, corporate spreads relative to Treasuries have widened significantly. This relationship is illustrated in the last column of Table 1. The increased perceived risk for corporate borrowers and the resulting higher long-term borrowing costs should be considered explicitly in estimating NW Natural's cost of capital.

Q. What levels of interest rates are forecast for the coming year?

A. Forecasts for Treasury bond rates have moderated in recent months. Over the coming year, both corporate and government interest rates are expected to remain stable. *Exhibit No.___ (SCH-2)*, page 3, provides Standard & Poor's most recent economic forecast from its *Trends & Projections* publication for February 2008. S&P forecasts slower, slightly negative economic growth for early 2008, with improving growth rates in the latter part of the year and for 2009. For 2008, growth in real Gross Domestic Product (GDP) is projected to be 1.2 percent, with nominal GDP (real GDP plus inflation) growth projected at 3.4 percent. By the second quarter of 2009, real GDP is expected to grow at a 2.3 percent rate with the nominal growth rate at 4.0 percent. These projected growth rates compare to real GDP growth rates of 2.9 percent for 2006 and 2.2 percent for 2007.

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S&P also forecasts that interest rates will increase during 2009. The summary interest rate data are presented in the following table:

Table 2
Standard & Poor's Interest Rate Forecast

	Feb. 2008 Average	Average 2008 Est.	Average 2009 Est.
Treasury Bills	2.1%	2.0%	2.6%
10-Yr. T-Notes	3.7%	4.0%	4.9%
30-Yr. T-Bonds	4.5%	4.5%	5.1%
Aaa Bonds	5.5%	5.7%	6.4%

Sources: www.federalreserve.gov, (Current Rates).
Standard & Poor's *Trends & Projections*, February 2008, page 8 (Projected Rates).

The long-term Treasury bond rate for 2009 is projected by S&P to average 5.1 percent. Similarly, the rate on Aaa corporate bonds is expected to increase from 5.5 percent to 6.4 percent. These data in addition to the higher corporate rates and wider spreads for corporate borrowers like utilities offer important perspective for judging the cost of capital in the present case.

Q. How have utility stocks performed during the past several years?

A. Utility stock prices have fluctuated widely. After reaching a level of over 400 in 2000, the Dow Jones Utility Average (DJUA) dropped to about 200 by October 2002. Since late 2002, the Average has trended upward. Its current level at over 500 is near a record high level. The wider fluctuations in more recent years are vividly illustrated in the following graph of DJUA prices over the past 25 years.

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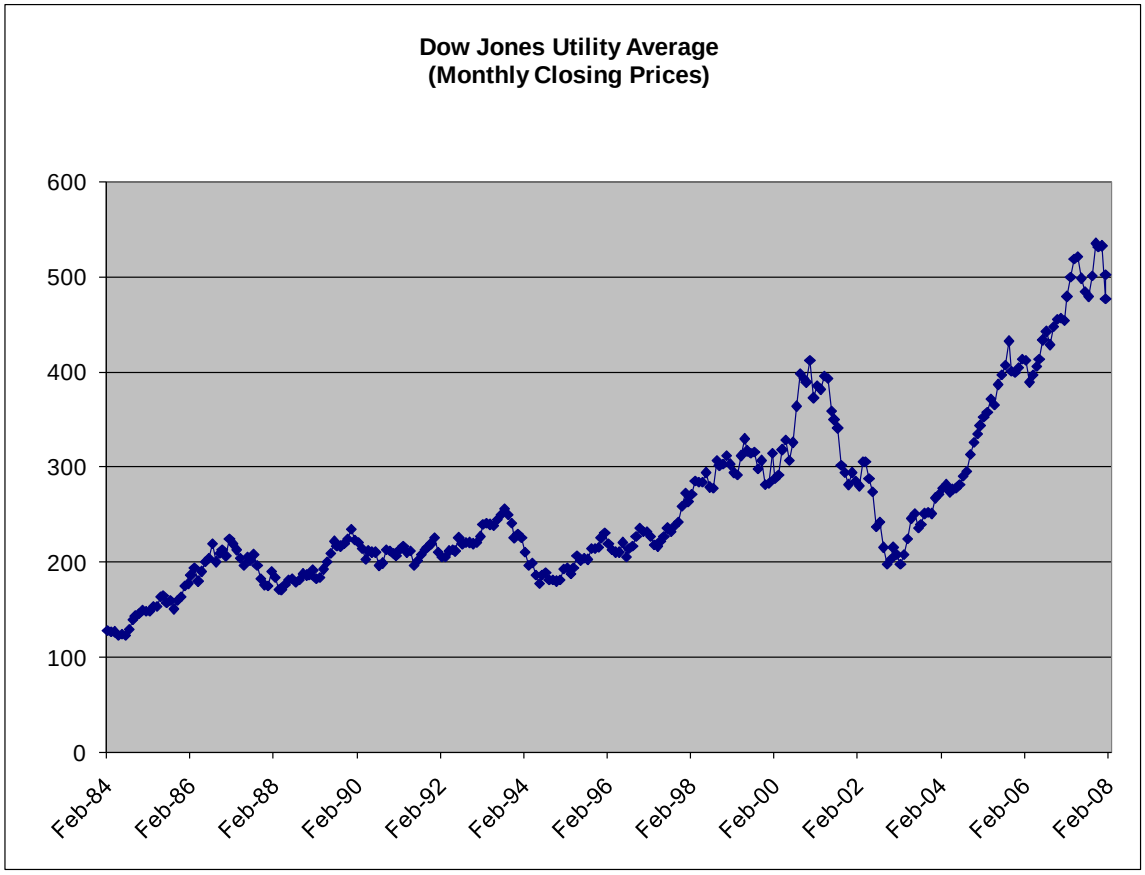

These factors, and continuing concerns for the more competitive markets for all utility services, will likely create further uncertainties and market volatility for utility shares. In this environment, investors' return expectations and requirements for providing capital to the utility industry remain high relative to the longer-term traditional view of the utility industry.

Q. How has the natural gas industry changed from the past?

A. As a result of FERC initiatives to restructure the natural gas pipeline industry, the nature of the gas supply function has changed significantly over the past 15 years for natural gas LDCs. The changes that have taken place have, among

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other things, eliminated the pipeline merchant function and completely unbundled the supply, transportation and storage functions provided by the interstate pipelines.

Q. What changes have occurred more recently?

A. Over the last several years LDCs have had to deal with rising and volatile natural gas prices. Rising prices reduce the price competitiveness of natural gas with other fuels. As described in Mr. Anderson's testimony, this circumstance presents challenges for NW Natural in particular. In a moderate climate like that in southwest Washington, this could lead to competitive gains for electric heat pumps. Moreover, the construction of new pipelines to move gas from the Rockies to the east will reduce or eliminate an advantage NW Natural currently enjoys in the form of an accessible supply basin with limited takeaway capacity.

Another recent development is the current economic uncertainty, which has resulted in a decline in housing starts and building permits. LDCs, including NW Natural, are seeing lower customer growth rates. As discussed in Mr. Anderson's testimony, this reduced growth is of particular concern for NW Natural, given that the higher growth rate it previously experienced enabled the Company to avoid seeking rate relief in Washington for several years. Lower growth will decrease the market value of NW Natural, and will make it a less attractive investment, thereby increasing its cost of capital. Another consequence of this lower growth is a higher proportion of non-revenue producing required capital expenditures for repair, replacement and moving of

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facilities. A third recent development of particular concern is increased emphasis on climate change issues and the impact on LDCs.

Q. Why is climate change a concern for LDCs?

A. As described in Mr. Anderson's testimony, public awareness of climate change issues has evolved considerably over the past few years and, in the Northwest in particular, has taken on a sense of some urgency in the public policy arenas. The consensus is that federal climate change legislation limiting greenhouse gas (GHG) emissions will be passed and signed into law in the near future. Depending upon how LDCs are treated under a carbon tax or cap and trade scheme, it could result in a round of price increases for LDCs and adversely affect their price competitiveness with other fuel sources. In addition, the impact of carbon control legislation will likely increase the demand for natural gas, thereby exacerbating the existing circumstances of higher and more volatile natural gas prices. This uncertainty as to the potential outcomes of GHG regulation at the federal level and its associated impacts results in additional risks to LDCs. As a consequence, investors, in turn, will require higher returns to compensate them for these risks.

Q. How have these changes affected LDCs?

A. The LDC operating environment continues to become more complex and more competitive, and the decision-making timeframe has been shortened – all translating into increased risk for LDCs. As the complexity and competitiveness

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of the natural gas industry increase, these risks can be expected to increase further.

Q. Does the Company currently have a decoupling mechanism in its Washington service territory?

A. No. It is my understanding that as part of this proceeding, the Company is seeking to implement in Washington a decoupling mechanism – the Partial Decoupling Mechanism (PDM) tariff and the weather-adjusted rate mechanism, (WARM) tariff– that mirror what is currently in place in Oregon. As described in Mr. Miller's testimony, adoption of the Company's decoupling proposal in Washington would represent an improved mechanism for recovering at least a portion of NW Natural's fixed distribution costs without strict dependence on variable sales volumes. This approach is reasonable, and it parallels similar methods for recovering fixed costs in other portions of the industry.

While the overall effect of the partial decoupling mechanism is beneficial, it was narrowly focused on a desire to enhance energy efficiency measures by customers without negatively impacting shareholders from those efforts. Relative to more general capital market uncertainties, and other larger potential effects on NW Natural's operating profits, however, the partial decoupling mechanism does not measurably reduce the Company's overall investment risk. While it mitigates increased earnings volatility and partially improves efforts to recover legitimate fixed operating costs, these are basic regulatory functions which should benefit both the Company and its customers. Standing alone, the

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decoupling mechanism's potential risk reduction would not justify setting my ROE recommendation below the mid-point of my DCF range.

Q. How do capital market concerns affect the cost of equity capital?

A. As I discussed previously in Section III, equity investors respond to changing assessments of risk and financial prospects by changing the price they are willing to pay for a given security. When the risk perceptions increase or financial prospects decline, investors refuse to pay the previously existing market price for a company's securities and market supply and demand forces then establish a new lower price. The lower market price typically translates into a higher cost of capital through a higher dividend yield requirement as well as the potential for increased capital gains if prospects improve. In addition to market losses for prior shareholders, the higher cost of capital is transmitted directly to the company by the need to issue more shares to raise any given amount of capital for future investment. The additional shares also impose additional future dividend requirements and reduce future earnings per share growth prospects.

Q. How have regulatory commissions responded to these changing market and industry conditions?

A. On balance, allowed rates of return have changed very little over the past five years. The following table summarizes the gas utility ROEs allowed by state regulatory commissions over the past five years.

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Authorized Gas Utility Equity Returns

	2003	2004	2005	2006	2007
1st Quarter	11.38%	11.10%	10.65%	10.63%	10.44%
2nd Quarter	11.36%	10.25%	10.54%	10.50%	10.12%
3rd Quarter	10.61%	10.37%	10.47%	10.45%	10.03%
4th Quarter	10.84%	10.66%	10.40%	10.14%	10.27%
Full Year	10.99%	10.59%	10.46%	10.43%	10.24%
Average Utility Debt Cost	6.61%	6.20%	5.67%	6.08%	6.11%
Indicated Risk Premium	4.38%	4.39%	4.79%	4.35%	4.13%

Source: *Regulatory Focus*, Regulatory Research Associates, Inc., Major Rate Case Decisions, January 8, 2008.

Over the past five years, as interest rates have declined, allowed equity returns have followed the interest rate decline. Since 2003, equity risk premiums (the difference between allowed equity returns and utility interest rates) have ranged from 4.13 percent to 4.79 percent. At the low end of this risk premium range, with an allowed equity risk premium of about 4.1 percent, the indicated cost of equity is 10.4 percent (6.3% single-A interest rate + 4.1% risk premium = 10.4%). At the upper end of this risk premium range, with an allowed equity risk premium of about 4.8 percent, the indicated cost of equity is 11.1 percent (6.3% single-A interest rate + 4.8% risk premium = 11.1%).

V. Cost of Equity Capital for NW Natural

Q. What is the purpose of this section of your testimony?

A. The purpose of this section is to present my quantitative studies of the cost of equity capital for NW Natural and to discuss the details and results of my analyses.

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Q. How are your studies organized?

A. In the first part of my analysis, I apply three versions of the DCF model to a 9-company group of gas utilities based on the selection criteria discussed previously. In the second part of my analysis, I apply various risk premium models.

My DCF analysis is based on three versions of the DCF model. In the first version of the DCF model, I use the constant growth format with long-term expected growth based on analysts' estimates of five-year utility earnings growth. While I endorse a longer-term growth estimation approach based on growth in overall gross domestic product, I show the traditional DCF results because this is the approach that has traditionally been used by many regulators. As I will explain, however, changes in the nature of the utility industry and wide fluctuations in analysts' growth projections for gas utilities call into question this approach. In the second version of the DCF model, for the estimated growth rate, I use only the long-term nominal GDP growth rate. In the third version of the DCF model, I use a two-stage growth approach, with stage one based on Value Line's three-to-five-year dividend projections and stage two based on long-term projected growth in GDP. The dividend yields in all three of the models are from Value Line's projections of dividends for the coming year and stock prices are from the Value Line editions from which the underlying financial data are taken.

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Q. Why do you believe the long-term GDP growth rate should be used to estimate long-term growth expectations in the DCF model?

A. Growth in nominal GDP (real GDP plus inflation) is the most general measure of economic growth in the U.S. economy. For long time periods, such as those used in the Ibbotson Associates rate of return data, GDP growth has averaged between 5 percent and 8 percent per year. From this observation, Professors Brigham and Houston offer the following observation concerning the appropriate long-term growth rate in the DCF Model:

> 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). On this basis, one might expect the dividend of an average, or "normal," company to grow at a rate of 5 to 8 percent a year. (Eugene F. Brigham and Joel F. Houston, Fundamentals of Financial Management, 11th Ed. 2007, page 298.)

Other academic research on corporate growth rates offers similar conclusions about GDP growth as well as concerns about the long-term adequacy of analysts' forecasts:

> Our estimated median growth rate is reasonable when compared to the overall economy's growth rate. On average over the sample period, the median growth rate over 10 years for income before extraordinary items is about 10 percent for all firms. ... After deducting the dividend yield (the median yield is 2.5 percent per year), as well as inflation (which averages 4 percent per year over the sample period), the growth in real income before extraordinary items is roughly 3.5 percent per year. This is consistent with the historical growth rate in real gross domestic product, which has averaged about 3.4 percent per year over the period 1950-1998. (Louis K. C. Chan, Jason Karceski, and Josef Lakonishok, "The

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> Level and Persistence of Growth Rates," The Journal of Finance, April 2003, p. 649)
> IBES long-term growth estimates are associated with realized growth in the immediate short-term future. Over long horizons, however, there is little forecastability in earnings, and analysts' estimates tend to be overly optimistic. … On the whole, the absence of predictability in growth fits in with the economic intuition that competitive pressures ultimately work to correct excessively high or excessively low profitability growth. (Ibid, page 683)

These findings support the notion that long-term growth expectations are more closely predicted by broader measures of economic growth than by near-term analysts' estimates. Especially for the very long-term growth rate requirements of the DCF model, the growth in nominal GDP should be considered an important input.

Q. How have analysts' three-to-five year growth projections changed over the past five years?

A. Analysts' forecasted growth rates for gas utilities have fluctuated widely during the past five years. While analysts' growth projections have increased somewhat during the past year, they are still significantly lower than they were in 2003. In *Exhibit No.___ (SCH-4)*, I compare current forecasts from Value Line for my comparable group companies to those that existed in 2003. During 2003, Value Line's projected three-to-five year earnings growth rate was 6.78 percent per year. In the most recent Value Line editions, the average projected earnings growth rate is only 4.81 percent. For the "b times r" sustainable growth rate, based on Value Line's projected retention rates and earned ROEs, there is also a significant drop. During 2003, for the comparable group the average "b times

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r" growth rate was 5.45 percent per year. Currently, the "b times r" growth rate based on Value Line's estimates is 5.30 percent. These comparisons further illustrate that analysts' growth rate projections are more volatile than one would expect for perpetual growth rate expectations, and that current projections from Value Line are low as compared to those used just five years ago. These results strongly support using more general long-term economic growth rates, such as GDP, in the DCF model.

Q. How did you estimate the expected long-run GDP growth rate?

A. I developed my long-term GDP growth forecast from nominal GDP data contained in the St. Louis Federal Reserve Bank data base. Those data for the period 1947 through 2007 are summarized in my *Exhibit No.___ (SCH-5)*. As shown at the bottom of that exhibit, the overall average for the entire period was 7.0 percent. The data also show, however, that in the more recent years since 1980, lower inflation has resulted in lower nominal GDP growth. For this reason I have given more weight to the more recent years in my GDP forecast. This approach is consistent with the concept that more recent data should have a greater effect on expectations and with generally lower near- and intermediate-term growth rate forecasts that presently exist. Based on this approach, my overall forecast for long-term GDP growth is 50 basis points lower than the long-term average, at a level of 6.5 percent.

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A. Discounted Cash Flow Analysis.

Q. Please summarize the results of your DCF analysis.

A. The DCF results for my comparable company group are presented in *Exhibit No.___ (SCH-6)*. As shown in the first column of page 1 of that exhibit, the traditional constant growth model indicates an ROE of only 9.2 percent to 9.4 percent. Because this range is well below my risk premium checks of reasonableness, it is excluded from my recommended DCF range. In the second column of page 1, I recalculate the constant growth results with the growth rate based on long-term forecasted growth in GDP. With the higher GDP growth rate, the constant growth model indicates an ROE range of 10.8 percent to 10.9 percent. Finally, in the third column of page 1, I present the results from the multistage DCF model. The multistage model indicates an ROE range of 10.4 percent to 10.5 percent. The results from my final two DCF models, therefore, indicate an ROE range of 10.4 percent to 10.9 percent for the comparable company group.

B. Risk Premium Analysis.

Q. What are the results of your other risk premium studies?

A. The details and results of my risk premium studies are shown in my *Exhibit No.___ (SCH-7)*. These studies and other risk premium data indicate an ROE range of 10.6 percent to 11.4 percent.

Q. How are your risk premium studies structured?

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A. My risk premium studies are divided into two parts. First, I compare LDC authorized ROEs for the period 1980-2007 to contemporaneous long-term utility interest rates. The differences between the average authorized ROEs and the average interest rates for the year is the indicated equity risk premium. I then add the indicated equity risk premium to the forecasted and current single-A utility bond interest rate to estimate ROE. Because there is a strong inverse relationship between risk premiums and interest rates (when interest rates are high, risk premiums are low and vice versa), further analysis is required to estimate the current risk premium level.

The inverse relationship between risk premiums and interest rate levels is well documented in numerous, well-respected academic studies. These studies typically use regression analysis or other statistical methods to predict or measure the risk premium relationship under varying interest rate conditions. On page 2 of Exhibit No.___ (SCH-7), I provide regression analyses of the allowed annual equity risk premiums relative to interest rate levels. The negative and statistically significant regression coefficients confirm the inverse relationship between risk premiums and interest rates. This means that when interest rates rise by one percentage point, the cost of equity increases, but by a smaller amount. Similarly, when interest rates decline by one percentage point, the cost of equity declines by less than one percentage point. I use this negative interest rate change coefficient in conjunction with current interest rates to establish the appropriate current equity risk premium.

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Q. How do the results of your risk premium study compare to levels found in other published risk premium studies?

A. Based on my risk premium studies, I am recommending a lower risk premium than is often found in other published risk premium studies. For example, the most widely followed risk premium data are provided in studies published annually by Morningstar. These data, for the period 1926-2006, indicate an arithmetic mean risk premium of 6.1 percent for common stocks versus long-term corporate bonds. Under the assumption of geometric mean compounding, the Morningstar risk premium for common stocks versus corporate bonds is 4.5 percent. With the more conservative geometric mean risk premium, the Morningstar data indicate a cost of equity of 10.8 percent (6.3% debt cost + 4.5% risk premium = 10.8%). Using the arithmetic risk premium, the Morningstar data indicate a cost of equity of 12.4 percent (6.3% debt cost + 6.1% risk premium = 12.4%).

Harris and Marston (H&M) also provide specific equity risk premium estimates.[2] Using analysts' growth estimates to estimate equity returns, H&M found equity risk premiums of 6.47 percent relative to U.S. Government bonds and 5.13 percent relative to yields on corporate debt. H&M's equity risk premium relative to corporate debt also indicates a current cost of equity of 11.4 percent (6.3% debt cost + 5.13% risk premium = 11.43%). Although the Ibbotson and

[2] Robert S. Harris and Felicia C. Marston, "Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts," *Financial Management*, Summer 1992.

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Harris and Marston results should not be extrapolated directly as stand-alone estimates of the cost of equity for regulated utilities, their results provide a reasonable long-term perspective on capital market expectations for debt and equity rates of return.

VI. Conclusion

Q. Please summarize the results of your cost of equity analysis.

A. The following table summarizes my results:

Summary of Cost of Equity Estimates

DCF Analysis	Indicated Cost
Constant GDP Growth Model	10.8%-10.9%
Two-Stage Growth Model	10.4%-10.5%
Judgment of DCF Range	10.4%-10.9%
Risk Premium Analysis	
Utility Debt + Risk Premium	
Risk Premium Analysis (6.3% + 4.3%)	10.6%
Ibbotson Risk Premium Analysis	
Risk Premium (6.3% + 4.5%)	10.8%
Harris-Marston Risk Premium	
Risk Premium (6.3% + 5.13%)	11.4%
NW Natural Fair Cost of Equity Capital	10.65%

Q. How should these results be interpreted to determine the fair cost of equity for NW Natural?

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A. Caution should be exercised in interpreting the basic quantitative DCF and risk premium results because they are based on recent historically low points in the economic cycle. Additionally, use of a lower DCF range would fail to recognize the market turbulence and ongoing risks that exist in the industry and for NW Natural. From this perspective, the fair and reasonable cost of equity capital for NW Natural is 10.65 percent.

VII. Qualifications

Q. Please state your educational background and describe your professional training and experience.

A. I have a Bachelor's degree in economics from Southern Methodist University, as well as MBA and Ph.D. degrees in finance and economics from the University of Texas at Austin (UT Austin). For almost 25 years, I have been an owner and full-time employee of FINANCO, Inc. FINANCO provides financial research concerning the cost of capital and financial condition for regulated companies as well as financial modeling and other economic studies in litigation support. In addition to my work at FINANCO, I have served as an adjunct professor in the McCombs School of Business at UT Austin and in what is now the McCoy College of Business at Texas State University. In my prior academic work, I taught economics and finance courses and I conducted research and directed graduate students in the areas of investments and capital market research. I was previously Director of the Economic Research Division at the Public Utility Commission (Commission) of Texas where I supervised the Commission's

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finance, economics, and accounting staff, and served as the Commission's chief financial witness in electric and telephone rate cases. I have taught courses at various utility conferences on cost of capital, capital structure, utility financial condition, and cost allocation and rate design issues. I have made presentations before the New York Society of Security Analysts, the National Rate of Return Analysts Forum, and various other professional and legislative groups. I have served as a vice president and on the board of directors of the Financial Management Association.

A list of my publications and testimony I have given before various regulatory bodies and in state and federal courts is contained in my resume, which is included as *Exhibit No.___ (SCH-8)*.

Q. Does this conclude your direct testimony?

A. Yes, it does.

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