QUANTIFYING DECOUPLING RISK

QUANTIFYING RISKS AND RETURNS

Decoupling is designed to separate revenues from volumetric sales. Because decoupling a utility's base revenues from sales has the effect of reducing the utility's exposure to revenue stream volatility caused by economic conditions, conservation, weather or any other operating condition that would normally cause revenue fluctuations, it lowers the risk of the utility. Lower operational risks for the utility equates to lower risk for investors, and should, in turn, result in lower allowed rates of return on equity and/or lower equity ratios in the ratemaking capital structure. In this Exhibit, I analyze the reduction in revenue volatility that Avista's Washington gas and electric operations would realize through a decoupling mechanism and provides an analytical framework through which that risk reduction can be assessed and the equity capital cost impact quantified.

An investor purchases a financial asset with the expectation that the asset will produce a future stream of income, generating an expected rate of return. The risk of investing in any asset is directly related to the possibility that actual, realized returns will deviate from expected returns. The greater the potential for actual returns to deviate from expected returns, the higher the risk. Conversely, the more certain an investor can be that the returns expected will be realized, the lower the risk.

One measure of a financial asset's risk, then, is the volatility or variability of the income stream it generates. Chart A, below, shows the income streams generated by two financial assets, "Asset A" and "Asset B." Both of the assets have, over time, provided a

trend of increasing returns. In fact, the trend line of the returns (shown as the dashed line

in Chart I) is exactly the same for both investments. Therefore, given that conditions in

the future could be expected to resemble those of the past, investors would, on average,

expect that the dollar returns produced by each investment to be the same in future

periods. However, the risk of the two assets is not the same.

Chart A.

Volatility and Risk
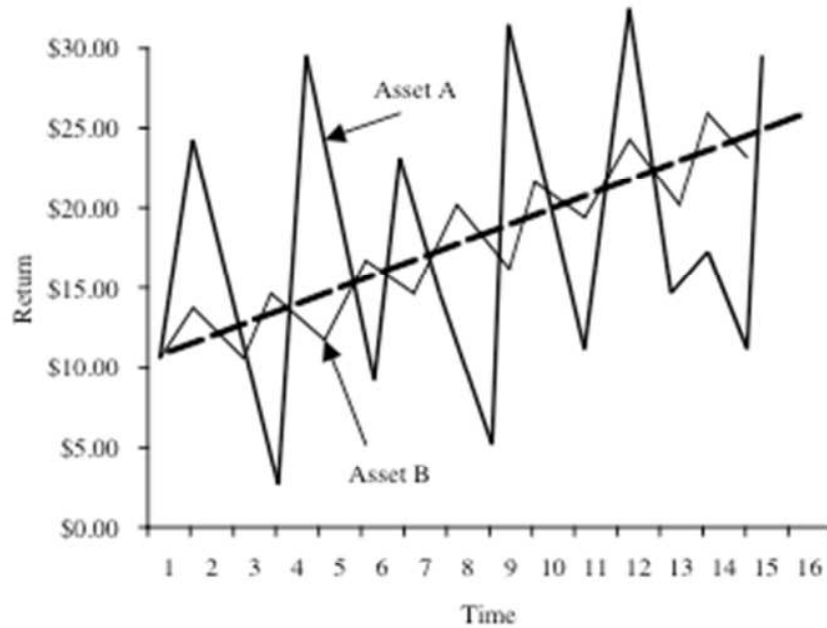
Asset A has shown much wider swings in return, much greater volatility, than has

Asset B. Therefore, even though Asset A has the same expected average future return

stream as Asset B, there is a much lower probability that the actual return realized from

an investment in Asset A will equal the expected return. Asset A, then, is a riskier

investment than Asset B, which, in all probability, will provide a return to investors that more closely approximates the expected return.

When an investor purchases a share of utility stock, he or she is purchasing an expected future stream of dividends and growth in that dividend, or capital appreciation when the stock is sold. That dividend expectation is, in turn, dependent on the income earned by the utility, which is directly related to stability of the revenues of the utility as well as the dividend payout ratio determined by management. If the firm's revenues are steady and show little fluctuation, the dividend is more secure and the investor sees the utility as being less risky than an otherwise similar investment whose dividend is based on a more volatile revenue stream. The fact that the return volatility of a financial asset is directly related to its investment risk is neither controversial nor difficult to comprehend, and that concept is fundamental to assessing the risk impact of decoupling. A decoupling mechanism works to reduce the revenue stream volatility of the utility's operations and, thus, its operating risk.

A decoupling mechanism separates utility revenues from unit sales—kWh in the case of an electric utility and Mcf or dekatherms in the case of a gas utility—and targets, instead, an overall revenue requirement. Under a decoupling ratemaking regime, if customer consumption is below the expected amount and revenues do not meet the projected level, the utility is allowed to increase unit rates in order to produce the projected revenue level. If, on the other hand, revenues exceed the target level, the utility is required to return to customers the amount of revenues that exceed the target level.

Importantly, in a full decoupling ratemaking regime, there is no mechanism for discerning the source of the change in customer usage. The reduction in usage may come from conservation, or it may come from lower customer usage due to factors unrelated to conservation, e.g., economic downturns, price elasticity effects on demand, changes in the firm's customer mix, technological changes, or weather-related factors. Because there is no practical way to distinguish the various factors that may affect customer usage, all the factors that could impact unit sales are necessarily included in the decoupling/make-whole process. In effect, decoupling acts as a regulatory pass-through rate adjustment for factors that cause revenue volatility, much like a fuel-adjustment clause for variations in fuel costs. Therefore, the decoupling process can operate as a buffer for the utility, sheltering its stockholders from fluctuations in revenues and, ultimately, moderating swings in operating earnings and dividends from causes that might otherwise arise from adverse conditions.

If, through a decoupling ratemaking process, the utility is made whole for operational variables that could affect revenues, the potential for volatility is reduced. Investors and investor advisory services are aware that a reduction in volatility reduces the overall investment risk of a utility operation. Therefore, the removal of the volatility and risk associated with those factors indicates that a utility operating under a decoupling mechanism has a lower investor-required return on equity than an otherwise equivalent utility operating under traditional regulation (i.e., without a decoupling mechanism).

Decoupling of sales from revenue lowers a utility's operating risk and unless that lower operating risk is reflected in rates through a reduction in the authorized rate of

return or some other appropriate measure, decoupling will produce a windfall for utility investors. Instituting a revenue-decoupling program for utilities without a concomitant downward adjustment to the allowed equity return, then, would create utility rates that exceed costs. Such rates would exceed just and reasonable levels and also would encourage an economically inefficient allocation of resources. Therefore, the allowed return on equity for a utility that is entering a regulatory framework in which revenues are decoupled from volumetric sales must be lower than that appropriate for the same utility under traditional regulation. The question here is—how much lower?

An analytical process through which the impact of revenue decoupling on the appropriate return on equity for the Avista electric and gas operations in Washington can be assessed is presented below. However, it is intuitively obvious that the more the utility's revenue volatility is eliminated by decoupling, the greater the risk reduction caused by decoupling and the lower the allowed equity return should be. If, for example, operating costs were constant and 100% of the revenue variations of a utility were due to factors eliminated by decoupling, that ratemaking mechanism could effectively turn a utility equity investment into a bond-like financial instrument. In that extreme theoretical instance, the level of uncertainty regarding the expected return that normally accompanies a utility equity investment would be significantly reduced and a risk-adjusted equity return would fall toward a return appropriate for utility debt capital.

Quantifying the change in operating risk of a utility operation due to a reduction in revenue volatility caused by a revenue decoupling mechanism is a two-step process. First, the degree to which fluctuations in utility revenues are dependent on operating

factors such as the underlying growth in the economy must be measured. Second, the net revenue volatility that normally exists with the utility operation must be quantified.

Measuring the degree to which fluctuations in utility revenues are dependent on changes in the operating environment is accomplished through regression analysis. In such an analysis, variables that represent economic conditions (Gross State Product ("GSP") for Washington and heating degree days) are regressed against the utility's net revenues over a relatively long time period. The "net revenues" are the Company's revenues less the expenses for fuel and purchased power (which are tracked and are recovered under a separate regulatory plan). Because those revenues associated with the factors that are "tracked" and "trued-up" are already addressed through a regulatory mechanism, they are not included in the assessment of decoupling risk reduction. Through such a regression analysis, it can be determined to what degree net revenues volatility is determined by those exogenous variables (e.g., economic activity).

For Avista's Washington jurisdictional operations, I studied the correlation between the Washington economy (Washington GSP), heating degree days (HDD) and gas and electric operation net revenues over the 2000 to 2012 time frame. The Company, in response to Public Counsel data requests, provided those historical financial and HDD data.[1] The Washington GSP is available on the U. S. Department of Commerce, Bureau of Labor Statistics web page.

Regressing those economic and weather variables cited above against the annual net revenues from 2000 through 2012 indicates, as shown on Exhibits__(SGH-13) and

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[1] Avista's Response to Public Counsel Data Request 63.

(SGH-14), page 1, they account for approximately 70% (electric) to 90% (gas) of the volatility in the Company's net revenues. That is, the r-squared value of the regression for Avista's Washington electric operations is 0.72 and that for the Company's gas operations is 0.96.[2] Therefore, economic activity and weather are important factors in determining the Company's net revenues, and were statistically significant in determining the fluctuations in net revenues. The regression coefficient of GSP was statistically significant at above the 99% level (t-statistics > 3.5) and the chance that the correlation indicated is random is very small, as indicated by the F-statistic (> 10; indicating probability < 0.01).

Although these regressions show a high correlation between weather, economic activity and the Company's net revenues, it is reasonable to be cautious about assuming that a revenue decoupling regime will eliminate nearly all of the revenue volatility-related risks, for several reasons. First, linear regressions are relatively simple approximations of reality and to the extent that changes in the Company's revenues have occurred in a more complex, non-linear fashion, they may not be fully captured in such an analysis. Moreover, because the economic growth data used in this analysis is only available annually, the analysis is based on a relatively small data set.

Second, this analysis of revenue volatility captures the total investment risk differences that may arise due to the implementation of a decoupling mechanism. However, according to theory, investors are primarily concerned with the non-diversifiable risk of an investment, not the total risk. Therefore, in theory, it is unlikely

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[2] Exhibits SGH-13 and SHG-14, page 3.

that investors will respond to the differences in total risk captured in this analysis because some portion of that risk could be diversified away.

The amount of diversifiable risk as a percentage of total risk for one company is not readily determinable, but because the majority of the volatility in the Company's net revenues is economy-related and because it is reasonable to assume that economic growth deviates from the norm in a random fashion, we can conclude that substantial amounts of the Washington-specific economic-related risk evidenced here could not be diversified away and that risk would matter to investors. Moreover, the economic environment in Washington is tied, in a general sense, to that of the U.S. as a whole, and system-wide economic risk (systematic risk), by definition, cannot be diversified away. One could also make the case that whatever diversification can be made vis-à-vis an investment in Avista (especially economy-related aspects) has already been made, and new opportunities for significant additional diversification will not arise as a result of the institution of a decoupling mechanism.

Third, revenue-decoupling regimes do exist in a few other regulatory jurisdictions in the US in addition to Washington. Edison Electric Institute reports in a 2013 publication that 12 states employ revenue decoupling.[3] Therefore, some of the lower risk imparted by decoupling will be captured in the stock prices of those utilities that enjoy that regulatory scheme. In the cost of capital analysis presented in this testimony, 22% of the jurisdictions in the sample group of electric companies have revenue decoupling. To the extent that the companies used to estimate the cost of common equity have a

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[3] Edison Electric Institute, "Alternative Regulation for Evolving Utility Challenges: An Updated Survey," 2013, p. 16.

decoupling regulatory regime, then, that risk would be included in the market-based cost of equity and a full decrement for decoupling depicted by these statistical analyses would, therefore, not be necessary.

In sum, while the robust statistical results of the volatility analyses presented herein lend credence to their reliability, it is important to note that we are estimating the impact of revenue decoupling on volatility and risk, and that investors may not include all of that risk reduction in the price they are willing to provide for Avista. Also, a relatively small portion of the operations of the utilities I use in estimating the cost of equity are in regulatory jurisdictions that employ revenue decoupling. Therefore, in estimating the average dollar/cost of equity impact of revenue decoupling on Avista's Washington operations, I utilize a conservative factor for the impact on revenue volatility of the operating variables studied.

A different regression analysis plays a part in quantifying the revenue stream volatility that has existed historically with Avista's utility operations in Washington. Chart B, below, shows the revenue stream of a hypothetical utility operation over time. Also shown in Chart B is the least-squares linear regression line, which represents the trend in revenues over that time period. In addition, the variance and standard deviation of the revenues around the trend line can be calculated. That process gives a quantitative measure of the volatility of the utility's revenues around the revenue trend or regression line. A similar graph of Avista's Washington electric and gas net revenues over the 2000—2012 period is shown in Exhibit__(SGH-13) and (SGH-14), page 2, respectively.

Chart B

Linear Regression of Historical Revenues
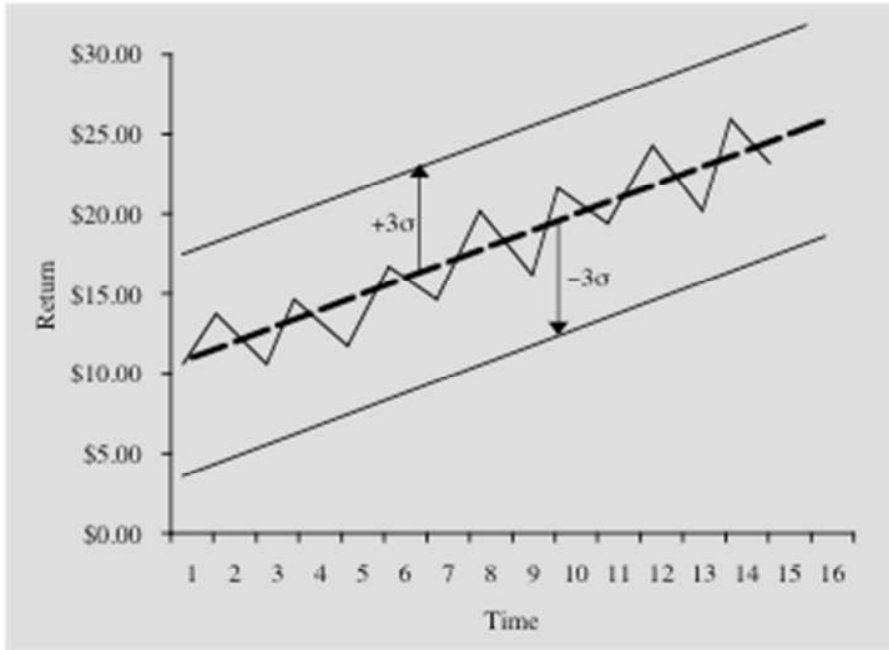
Once the standard deviation of revenues about the trend line is established, a zone of ±3 standard deviation units (s) above and below the revenue trend line can be established. With utility net revenues normally distributed about the revenue trend, a zone ± 3s above and below the revenue trend line establishes a range within which the utility's met revenues will fall 99.9% of the time. For the Avista operations in Washington, the calculation of the trend line as well as the distribution about the trend line and the historical volatility for net revenues is shown in Exhibits__(SGH-13) and (SGH-14), page 3.

Page 3 of Exhibit__(SGH-13) and (SGH-14) show the net revenue volatility that has existed for Avista's electric and gas utility operations, respectively, in Washington over the 2000-2012 period. As noted above, in assessing the impact of decoupling on the

Company's cost of equity, I assume that the reduction in historical volatility will not be complete. As shown in page 1 of Exhibits__(SGH-13) and (SGH-14), about 70% of the electric operations' net revenue volatility is explained by the changes in economic and weather conditions and about 90% of the changes in Avista's gas operations' net revenue are determined by those factors. In assessing the reduction in volatility and the reduction in the cost of capital due to decoupling, however, I assume the reduction in volatility for electric operations will be about 40% and the reduction in gas operation net revenue volatility will be about 50% (rather than 70% to 90%). That is, my assumption is that decoupling will reduce net revenue volatility to roughly half of the historical volatility experienced over the 2000-2012 period. This is a conservative adjustment, which could result in an understatement of the equity return decrement for decoupling that is necessary to balance the interests of investors and ratepayers. However, I believe, it fairly recognizes that the impact of decoupling will not completely eliminate volatility, and any such analysis represents an approximation of reality.

In order to estimate the impact of the reduction in volatility, I assume that, over time, utility revenues will be randomly distributed. The distribution of net revenues about the historical trends can also be represented as the familiar bell-shaped curve shown below in Chart C.
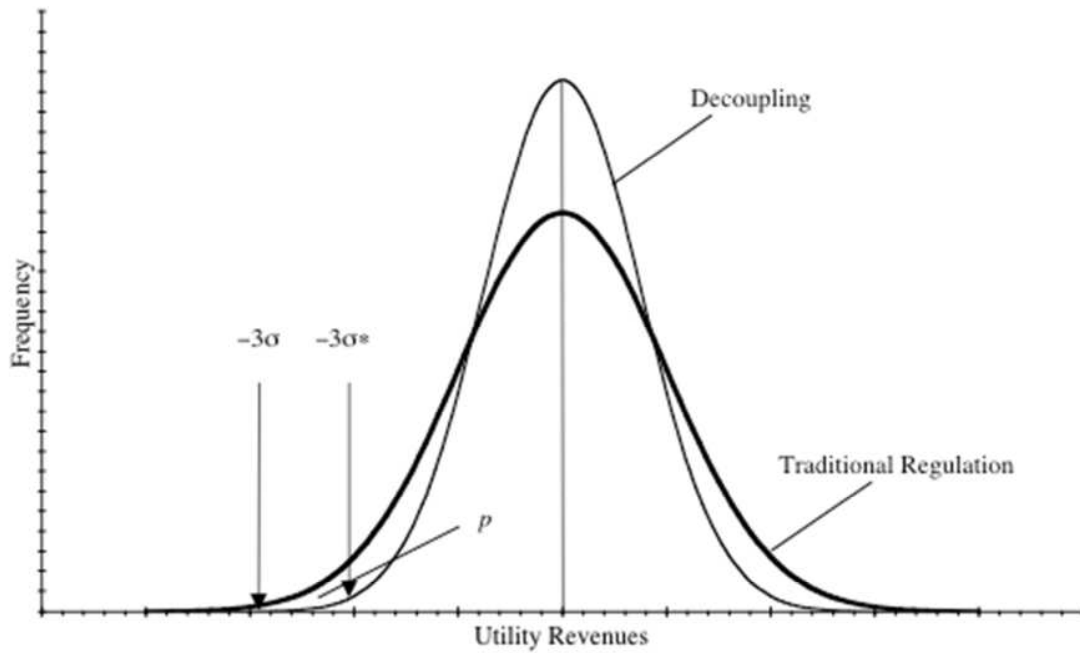
Chart C

Revenue Distribution Under Traditional Regulation
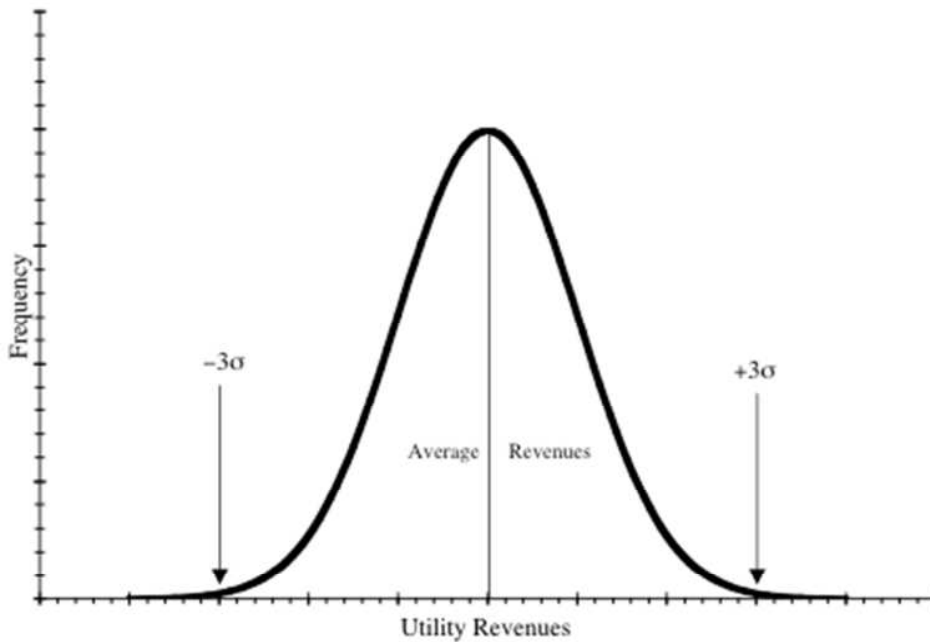
When the volatility of the revenue stream is reduced, in this case by a decoupling mechanism, the variance of the revenues about the trend line shown in Chart B is reduced and the width of the zone ±3s above and below the average trend line narrows. In other words, as the volatility of the utility's revenue stream is reduced, the possibility that the actual revenue or net income (which will fall within ±3s) will more closely approximate the expected net revenue (represented by the trend line) is increased and, therefore, the utility's operating risk is reduced. Further, as the volatility of the utility's revenues around the trend line is reduced, the shape of the "bell curve" graph of the revenue distribution changes. As shown in Chart D, while still centered on the average expected revenue, the "bell" formed by the distribution of utility revenues under decoupling becomes taller and thinner.

Chart D

Revenue Distribution Differential With Decoupling

It is through this change in the shape of the distribution of possible revenue outcomes, shown in Chart D, that we are able to quantify the impact of decoupling on the cost of equity capital. When the variance of revenues about the trend line is reduced, the possibility of more extreme outcomes both negative and positive, are eliminated. To the investor, the risk-reducing aspect of this change is the elimination of the possibility of extreme negative revenue outcomes.

Under traditional regulation it is possible that the utility could experience revenues at the extreme lower left corner of the original revenue distribution (-3s). This would represent an adverse risk outcome to the investor. Under a less volatile decoupling

scenario, however, the revenue distribution is narrower, the expected revenues more certain and the most negative outcome (-3s* on the new bell curve) is a higher revenue value and, thus, represents less risk to the investor.

The pertinent difference in the probability outcomes under the traditional and decoupling scenario can be quantified as the difference in the area in the graph between the two curves, i.e., between -3s and -3s*. This area (designated as "*p*" in Chart D) between the original distribution curve and the new (decoupling) curve represents the reduction in the probability of an extreme negative outcome that existed prior to the adoption of decoupling. As shown in page 4 of Exhibit__(SGH-13) and (SGH-14), the probability differential ("*p*") represented by a 40% reduction in historical net electric revenue variance equals approximately 0.00869, which represents approximately 0.87% of revenues, and a 50% reduction in historical net gas revenue variance equals approximately 0.00156, which is roughly 1.56% of revenues. Note, the greater reduction in volatility (50%) is more valuable to investors because it will result in a lower probability of negative outcomes.

This analysis indicates that investors would be indifferent between traditional regulation and revenue decoupling if the equity return under decoupling produced a revenue requirement 0.87% (electric) to 1.56% (gas) less than that under traditional regulation. In order for the equity return interests of investors and ratepayers to be balanced under a revenue decoupling regulatory regime, then, the allowed return will have to be less than that allowed under traditional regulation. In this instance, the appropriate reduction in equity return is estimated as the equity return difference that

would reduce net revenues by 0.87% to 1.56%, on average, based on the Avista Washington electric and gas utility historical results over the past twelve years.

Exhibit__(SGH-13), page 4 shows the calculations necessary to quantify the risk-reduction impact of the revenue decoupling mechanism with regard to the Company's electric net revenues. As noted above, the probability of extreme negative outcomes in the Company's Washington electric utility net revenues is reduced by about 0.87% when the historical revenue variance is reduced by the 40% factor discussed previously. When this percentage is multiplied by the electric operations' average annual net revenue over the past twelve years ($389.645 Million), the result is $3.386 Million annually. That is, due to the risk-reducing nature of revenue decoupling, investors would be indifferent between Avista's Washington electric operations realizing an average of approximately $389 Million in net revenues per year as it has under traditional regulation and receiving $3.3 Million less than that amount annually under a revenue decoupling regulatory framework.[4]

This annual reduction in revenues for Avista's electric operations is translated in to an equity return differential by first estimating that during the 12-year study period, the Company's electric utility jurisdictional rate base averaged $876 Million and its common equity ratio averaged 46.68%.[5] Given the historical record established by the Company, a 1% reduction in equity return over the historical period studied would, on average, have resulted in an annual return-related revenue reduction of $6.29 Million (1% x 46.68% (equity ratio) x $876.683 Million (Rate Base) ÷ (1-35% tax rate)). Therefore, if an

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[4] Similar calculations are shown for Avista's gas operations in Washington in Exhibit__(SGH-14), p. 4.
[5] Data from Company responses to ICNU-1.19 and PC-63 and 129.

appropriate return adjustment for decoupling calls for a reduction of approximately $3.4 Million in annual revenues (as noted above and shown on Exhibit__(SGH-13), page 4), and a 1% reduction would have caused a revenue reduction of about $6.29 Million, then an equity return adjustment of 54 basis points for Avista's electric operations would be indicated under a decoupling regulatory regime (1% x 3.386 Mill/$6.29 Mill.).

Page 4 of Exhibit__(SGH-14) shows that appropriate decoupling-related equity return decrements for Avista's gas distribution operations in Washington, assuming a 50% reduction in revenue volatility, is 82 basis points. Therefore, as an appropriate equity return decrement related to decoupling utility revenues from unit sales, I recommend the Commission use 50 basis points for Avista companies in this proceeding. In other words, with a decoupling regime in place, in order to balance the interests of ratepayers and the Company's stockholders, Avista's allowed return on common equity should be reduced by 50 basis points from that determined in a market-based analysis.