

## **SECTION 7. MODELING AND ANALYSIS**

Regarding the use of modeling for portfolio planning and natural gas procurement, the Guidelines state:

- (1) “The utility's natural gas supply portfolio planning and resource procurement and decision-making processes should incorporate cost-effective computer modeling and analyses.
- (2) The modeling employed by the utility should support an informed dialogue with its advisory committee, and contribute to prudent and informed judgments in the portfolio planning and resource acquisition process.

The Natural Gas Supply has many characteristics that reduce the amount and type of modeling that must be performed as NWE carries out the Energy supply function. Two key characteristics associated with serving Energy Supply are: load growth stability and natural gas market liquidity. Given the stability of Energy Supply’s load growth, planning requirements are simplified. Also, natural gas markets are relatively liquid, and, even if there are unanticipated loads, additional supply is usually available so long as adequate transportation exists.

The Energy Supply Market Operations function (“Operations”) does employ some computer modeling (primarily using cost-effective spreadsheets), and the use of market forecasts, in its work. However, Operations primarily employs a combination of disciplined market purchases (consistent with this Plan) and opportunistic purchases informed by market intelligence and experience – both of which are informed by long-term forecasts that are discussed below.

### Natural Gas Price Market Trends

Natural gas supply prices are determined by fundamentals (generally supply/demand relationships) and psychological influences in global markets. These influences include the perception of events that may occur, as well as actual events. Factors affecting the price of natural gas can include participation by financial entities in the markets, supply and demand trends (actual and

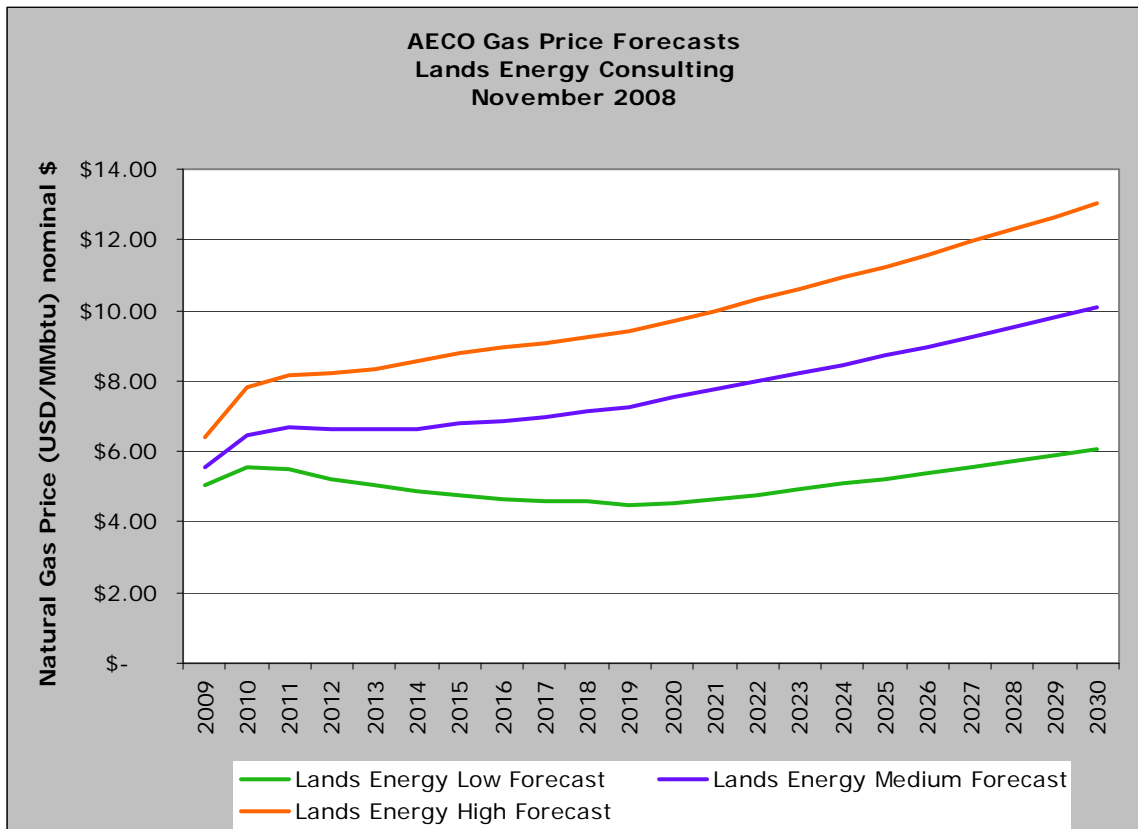
perceived), gas-fired electric generation requirements, the impact (and potential impact) of hurricanes or other natural disasters on production, national storage inventory levels, crude oil prices, and numerous other factors. NWE is generally a price-taker (i.e., NWE Energy Supply has little ability to influence prices or negotiate for a price that is significantly different from the market index price). Further, the price of supply to Montana is not determined by the relationships of Montana loads and the availability of supplies in Montana. In general, Montana supply costs are primarily a function of prices at the AECO hub, with relatively small discounts or premiums, which are determined through negotiations.

An in-depth gas price forecast is derived from a comprehensive analysis of numerous supply and demand elements at the regional, national, and world levels. A comprehensive long-term gas price model requires analysis of numerous elements of supply and demand. Purchasing a long-term price forecast allows NWE to obtain the results of such a model at substantially less than it would cost to develop internally and it serves to limit bias on the part of NorthWestern

At least two different types of uncertainty influence the accuracy of any forecast: uncertainty related to long-term changes in the industry, and uncertainty related to short-term gas price variability. Contributing to long-term uncertainty are long-term demand and supply issues, including, as just two examples, growth in gas demand for electricity generation and development of Liquid Natural Gas (LNG) supply. Short-term gas price variability also affects the variance of long-term forecasts of gas prices. Actual gas prices in future months will reflect variability due to short-term conditions. Examples of short-term supply and demand factors that can significantly affect prices include actual weather conditions in various markets, expected short-term weather conditions, and storage inventory balances. In other words, the actual price of natural gas in the future will be influenced by short-term market fundamentals. Forecasts cannot capture market realities of this type.

NWE has contracted for energy forecasting and research services provided by Lands Energy Consulting (Lands), at a fraction of what it would cost to develop internally, Land's forecast will be fairly inexpensive compared to a study that is provided by a national organization and the results are fully available and not held confidential by copyright. Full disclosure of Lands methods and results are important to the gas procurement plan so individuals reading the plan can understand how the analysis was developed. The Lands gas price forecast provides a plausible set of natural gas market price scenarios that is fundamentally based on the extension of current market prices into the future. NWE uses the Lands long-term fundamental gas price forecasts for informational purposes. Figure 4 depicts a range of natural gas price forecasts recently prepared by Lands for the AECO trading point.

Figure 4



Although long-term natural gas forecasts have inherent limitations, the information provided by Lands' forecast gives another point of reference to NWE in its resource acquisition decision-making process. Gas price assumptions are important for natural gas acquisition planning. However, both long- and short-term uncertainties make over-reliance on these tools problematic.

NWE understands that its acquisition strategies must take uncertainty into account. (In fact, short-term uncertainties and price volatility are factors that argue strongly for a systematic purchasing approach such as NWE describes below in its hedging proposals). Actual resource acquisition decisions, while gaining some perspectives from long-term forecasts, are based more on short-term fundamentals.

NWE also uses natural gas forward market prices to observe the prices at which market participants are willing to transact for delivery in future months. This provides information, but only at a particular point in time. Forward prices augment the information provided in the longer-term fundamental gas price forecasts.