

## COST-OF-SERVICE GAS

### Cost-of-Service (COS) Modeling Factors

For over three decades, Questar Gas' customers have benefitted from natural gas produced pursuant to the Wexpro Agreement.<sup>41</sup> The Wexpro Agreement, signed in 1981, defines the relationship between Wexpro and Questar Gas. Under this relationship, Wexpro manages and develops natural gas reserves within a limited and previously established group of properties. Production from these reserves is delivered to Questar Gas at cost-of-service, which historically, on average, has been lower-priced than market-based sources.

In recent years, natural gas supplies provided pursuant to the Wexpro Agreement have exceeded one half of the total annual supplies required to meet the needs of Questar Gas customers. During calendar year 2013, Wexpro produced 71.9 MMDth of cost-of-service supplies, up from the 70.0 Bcf level produced during calendar year 2012.<sup>42</sup> The 2013 production level was approximately 59 percent of Questar Gas' supply requirement.<sup>43</sup> As development drilling continues to occur, Wexpro anticipates that there will be many more years of production from these sources, due in part to technological improvements in drilling and production methods.

From calendar year 2012 to 2013, the total costs, net of credits and overriding royalties, for cost-of-service production increased by approximately 12.4 percent. This increase was driven primarily by two cost components. First, the development-gas cost-of-service component increased by approximately 7.8 percent. Second, royalties paid to other parties increased by approximately 38.6 percent, driven by increases in natural gas market prices, a factor that no single entity can control. Cost-of-service production is an effective long-term hedge against price volatility. A continuous drilling program allows for the retention of valuable personnel. More information on Wexpro's planned development-drilling programs is contained in the Future Resources part of the "Cost of Service Gas" section of this report.

In January of 2014, the Utah and Wyoming Commissions approved the Trail Unit Acquisition as a Wexpro II Property. The terms and conditions of the Trail Unit Acquisition Settlement Stipulation contained in Section 14 govern the transition time period from the approval date of the Trail Acquisition through May 31, 2015. During this period, Wexpro production volumes that cannot be used to meet demand or be injected into storage facilities will either be shut in or sold to a third party. Questar Gas will minimize costs to customers by evaluating whether production is to be shut in or sold by comparing the sales price for natural gas with the estimated price of cost-of-service production after subtracting the

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<sup>41</sup> "The Wexpro Stipulation and Agreement," Executed October 14, 1981, Approved October 28, 1981, by Public Service Commission of Wyoming and December 31, 1981, by Public Service Commission of Utah.

<sup>42</sup> On a net revenue interest basis, cost-of-service production was 59.2 Bcf for 2013 and 57.5 Bcf for 2012. See Questar Corporation's 2013 Annual Report, Page 31.

<sup>43</sup> Questar Corporation's 2013 Annual Report, Page 3.

associated shut-in costs.<sup>44</sup> The customers of Questar Gas will be credited with the proceeds from the sales of cost-of-service production.

In complying with Section 14 of the Settlement Stipulation and after discussions with the Division, the Office and the Wyoming Office of Consumer Advocate, the Company intends to use as the price of cost-of-service gas, the actual per-Dth cost of cost-of-service gas for the most recent twelve months available. The Company could have chosen to use either the most recent year-end data or the forecast used in the most recent pass-through/pass-on docket. However, the Company believes that the data from the most recent twelve months is the most current and accurate data. The Company intends to use a daily fixed price or a monthly fixed price as the sales price for natural gas. Shut-in volumes will be included in the quarterly variance reports provided to regulatory agencies as discussed below.

One of the most important results of the SENDOUT modeling process is a determination of the appropriate production profiles for the cost-of-service gas. This year, Questar Gas modeled 106 categories of cost-of-service production. Last year, it modeled 94 categories. Questar Gas increased the number of modeled categories to model the new production from the Trail Unit acquisition. Both years, Questar Gas used a modeling time horizon of 31 years. A relatively long time horizon better reflects the fact that cost-of-service gas is a long term resource.

Questar Gas created these 106 categories of cost-of-service gas to naturally group wells which have common attributes including factors such as geography, economics and operational constraints. A large amount of data must be compiled to provide the inputs to the SENDOUT modeling process. Questar Gas has relied on the expertise of Wexpro personnel in assembling the data elements needed to model each category. Some of those data elements are: reserve estimates, production decline parameters, depreciation and amortization rates, carrying costs, general and administrative costs, operating and maintenance costs, production taxes, royalties, income taxes, and oil revenue credits. The “Final Modeling Results” section of this IRP contains the probability curves and median levels of production for cost-of-service gas resulting from the SENDOUT modeling process this year.

As discussed in the Introduction to this report, the Utah Commission, in its Report and Order issued October 22, 2013 concerning Questar Gas’ 2013 IRP, required the Company to provide a scenario analysis as requested by the Office.<sup>45</sup> The Office requested that the 2014 IRP provide results from multiple SENDOUT modeling scenarios. These scenarios should include varying percentages of Wexpro gas with varying levels of Questar Gas demand (e.g., low, normal, and high). For each scenario, the Office requested that the Company provide expected management actions, such as projected well shut-ins. Scenario results should include the impacts of those management actions on overall costs. Appendix A of this report contains the requested scenario analysis.

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<sup>44</sup> Based on information available at the time.

<sup>45</sup> In the Matter of Questar Gas Company’s Integrated Resource Plan for Plan Year: June 1, 2013 to May 31, 2014, The Public Service Commission of Utah, Report and Order, Docket No. 13-057-04, Issued: October 22, 2013.

Since the late 1990s, Questar Gas has submitted quarterly variance reports to Utah regulatory agencies, as required under the Utah Commission's IRP standards and guidelines. These reports detail the material deviations between planned performance and actual performance of cost-of-service natural gas supplies. Under the 2009 IRP Standards, that process will continue into the future.

There are many reasons the quarterly variance reports often show variance between anticipated volumes and actual production. As part of the IRP modeling process, Wexpro and Questar Gas are required to anticipate the production capability of more than 1,420 wells. Some of these wells have not been drilled yet, but are included in the planning process. Forecasting production from existing wells is not a precise science, and forecasting for wells not yet drilled involves even more uncertainty. New wells can be, and occasionally are, dry holes. Production from new wells can vary from non-commercial quantities to levels several times that anticipated during the planning process. Fortunately, non-commercial wells occur very rarely.

Unanticipated delays during the partner approval process can also postpone planned production. Delays during permitting, drilling and completion can also affect the timing of production volumes. An unexpected archeological find on a drill site can cause extensive delays for all the wells planned for the site, or can cause the wells not to be drilled at all. Even small delays can cause schedules to conflict with environmental windows for the migration, mating and/or nesting of local species, resulting in greater delays. Pad drilling, with all its inherent cost efficiencies can also create delays. Since all the wells on a pad are typically hooked up to a single gathering system, any delay in one well affects the production timing of all the pad wells.

For existing wells, a multiplicity of geotechnical factors can affect production levels. Although reservoir engineers are skilled in the utilization of sophisticated techniques to forecast future production decline rates, precisely predicting the performance of reservoirs many thousands of feet deep is complex and uncertain. The fact that the pressures of the connected gathering lines are constantly changing due to fluctuating supplies into, and demands from, the local gathering system further complicates the production process (a phenomenon often totally out of the control of the producers). New wells drilled by any party typically come in at very high pressures and, in the short term, can "pressure-off" old wells temporarily affecting existing production levels from a field. While compression can remedy such problems, those costs must be factored into the overall economics of the production stream. Also, the design and construction of compression facilities takes additional time to complete. There are many reasons for variances between planned and actual cost-of-service gas volumes.

## **Producer Imbalances**

In most of the cost-of-service wells, there are multiple working interest partners. Each of these partners generally has the right to nominate its legal entitlements from a well subject to restrictions as defined in the operating agreement and/or gas balancing agreement

governing that well. As the individual owners in a well each nominate supplies to meet their various marketing commitments, imbalances between the various owners are created. Imbalances are a natural occurrence in wells with multiple working interest owners. There are no fields or wells with multiple owners having individual marketing arrangements where an imbalance does not exist. No individual working interest owner can control, in the short term, the level of producer imbalances associated with a well because it does not have control over the volumes that the other working interest owners are nominating. Anytime allocated wellhead volumes differ from legal entitlements for any one party an imbalance is created for all the parties in the well. The fact that it is not uncommon for the market of a working interest owner to be lost unexpectedly, either in part or in full, for a variety of reasons, further complicates matters. This can happen without the knowledge of the other parties for a significant period of time, and will contribute to an imbalance.

For some wells with multiple working interest owners, contract-based producer-balancing provisions exist. These provisions generally allow for parties that are under-produced to nominate recoupment volumes from parties that are over-produced. Given the time lag in the accounting flow of imbalance information, delays of several months can occur. The process becomes more complicated because several weeks' advance notice is typically necessary before imbalance recoupment nominations can occur.

Over the past year, producer-imbalance recoupment has taken place in several areas where Questar Gas is entitled to cost-of-service supplies. Table 6.1 shows the monthly volumes nominated in these areas for recoupment during calendar year 2013 and for the first two months of 2014.

From May of 2013 through September of 2013, Questar Gas did not take its full legal entitlements from the Canyon Creek Field. A balancing agreement exists between the working interest owners in Canyon Creek which allows an under-produced party to nominate up to 50 percent of the over-produced party's entitlements, in any of several well categories, anytime during the year, given proper notice. As an under-produced party, Questar Gas nominated and received recoupment volumes during January and February of 2014.

As can be seen in Table 6.1, other parties have been recouping from Questar Gas. In the Moxa Arch area, a working interest partner of Questar Gas has been recouping in a number of Church Buttes Buffer wells and in a Blacks Fork well. Recoupment volumes were also nominated by other parties in the Mesa/Pinedale area where Questar Gas has been over-produced for a number of years.

As of December 31, 2012, Questar Gas had a total net producer imbalance level for all of the fields from which it receives cost-of-service production of approximately 2.1 Bcf.<sup>46</sup> By way of comparison, the total net producer imbalance level for December 31, 2013 was approximately 0.1 Bcf. The Wexpro Agreement Hydrocarbon Monitor reviews producer imbalances as part of its responsibilities. In a recent audit report, the Hydrocarbon Monitor concluded that the total producer imbalance levels were reasonable.<sup>47</sup>

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<sup>46</sup> A positive imbalance means volumes are owed to other parties.

<sup>47</sup> Wexpro Hydrocarbon Auditor Review, Evans Consulting Company, April 2014.

## Future Resources

The current market price of natural gas coupled with future price expectations directly drives the level of drilling in the U.S. But other factors play into the drilling decision. Knowledgeable personnel such as reservoir engineers or geotechnical experts are among the most valued personnel resources in any energy production company. Increasing or decreasing staff with swings in market prices generally results in the loss of valuable employees with specific knowledge. It can also make sense to drill when prices are down because drilling costs are generally lower then. By the time a well is drilled and turned to production, prices may have rebounded.

In many situations, drilling permits dictate that leases must be developed within a specified period of time (such as two years) or the leases will be lost. These provisions generally prevent exploration and production companies from holding leases indefinitely without creating value for royalty owners. In the current price environment, a substantial portion of drilling in shale gas plays continues in order to hold leases.

There can be other factors affecting the rate of leasehold development. For example, Questar Gas' customers benefit from the receipt of significant quantities of cost-of-service production from wells in the Pinedale Anticline Project Area (PAPA) in Sublette County, Wyoming. Development in the PAPA is governed by a Record of Decision (ROD), issued by the U.S. Department of Interior, Bureau of Land Management during September of 2008. The ROD was issued in response to certain environmental mitigation measures and operational safeguards proposed by the partners in PAPA.<sup>48</sup>

As a means of minimizing environmental impacts, the Pinedale ROD, in an orderly and systematic way, allows for concentrated development by limiting the number of well pads and requiring the maximum use of existing well pads before constructing new well pads. Operators are required to "stay on a well pad until the well pad is completely drilled out".<sup>49</sup> Drilling is fundamentally sequential with time limitations for development in certain areas.

Wexpro's focus is to maintain its long-term drilling plans, thereby continuing to benefit Questar Gas' customers. For calendar year 2014, Wexpro plans on drilling approximately 8.1 net wells with a capital budget for those wells of approximately \$29 million.<sup>50</sup> For the years 2015 through 2018, the planned net wells are approximately 7, 38, 24 and 40 respectively, with annual investments in the range of \$27 to \$90 million. Given the uncertainties in the financial and natural gas markets, these longer term estimates could vary. Drilling activity through the remainder of 2014 and on into 2015 is expected to focus primarily in the Pinedale field. The Trail Unit drilling program for both Wexpro I and Wexpro II properties is expected to begin in the later part of 2015.

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<sup>48</sup> Record of Decision for the Supplemental Environmental Impact Statement, Pinedale Anticline Oil and Gas Exploration and Development Project, U.S. Department of the Interior, Bureau of Land Management, Cheyenne Wyoming, September 12, 2008.

<sup>49</sup> *Ibid.*, Summary, Page 20.

<sup>50</sup> "Net wells" are the summation of working interests (total and partial ownership).

Plans, forecasts and budgets for drilling development wells under the Wexpro Agreement are always subject to change. Many factors including economic conditions, ongoing success rates, partner approval, availability of resources (rigs, crews and services), access issues associated with environmentally sensitive areas, re-completion requirements, drainage issues and demand letters all have an impact on drilling and capital budget projections.

### **Production Shut-ins**

Questar Gas utilizes the SENDOUT model to optimize the use of cost-of-service production. The SENDOUT model will choose to shut in the production when it determines this is the most optimal solution considering gas costs, storage availability and demand.

Based on the forecast for production provided by Wexpro and normal weather, the model determined that some cost-of-service production should be shut in for June 2014 through September 2014. The level of forecasted shut-ins is shown in Table 6.2 and should be considered as the forecasted excess production for these months. The terms and conditions of Section 14 of the Trail Unit Acquisition Settlement Stipulation require that the Company conduct an analysis to determine whether excess production should be shut in or sold. The Company would conduct such analysis considering the cost-of-service production, the carrying cost associated with this level of excess production, and the cost of other storage services.

Table 6.2 – 2014 Production Shut-ins

	<b>June</b>	<b>July</b>	<b>August</b>	<b>September</b>
Shut in Production (Dth/day)	10,263	28,525	31,787	7,001