With a Permian Well, They Cried More, More, More – Part 2

Natural Gas Takeaway May Become a Bigger Problem for Producers than Crude Constraints

- **Permian natural gas production is up nearly 40% over the past three years to 6.3 Bcf/d, with most of that production classified as associated gas that comes along with crude oil.**
- **Today there is more than enough pipeline takeaway capacity for this production - approximately 10.8 Bcf/d. But due to market/demand constraints, not all this capacity is available to Permian producers.**
- **That will become much more of a problem for producers as Permian natural gas production grows to more than 12 Bcf/d in 2022. Capacity could become constrained out of the basin by late 2018.**
- **If gas pipeline takeaway is constrained, since most gas is associated production, the implication is that both crude and gas production would need to be reduced, either by curtailing drilling or even shutting in production.**

1. Introduction

- The Permian is all about crude oil, right? Wrong! The fastest growing energy commodity over most of the past year in the Permian was not crude. It was natural gas.
- The region with the lowest breakeven prices for natural gas is Appalachia — the Marcellus/Utica, right? Wrong! It's the Permian. Many of the most prolific Permian plays have *negative* natural gas breakeven prices.
- Lack of crude oil pipeline takeaway capacity is the biggest threat to crude oil production growth in the Permian, right? Wrong again! As counterintuitive as it may seem, constrained gas takeaway is a bigger threat to crude production growth than crude takeaway.

The fact is that natural gas production in the Permian is up nearly 40% over the past three years, with most of that production classified as associated gas that comes along with crude oil. And over the next five years, at least one-third of all U.S. natural gas production growth will come from wells that Baker Hughes classifies as Permian crude wells. The bottom line is that the Permian is much more dependent on natural gas market dynamics than is generally recognized.

But like all rapidly growing U.S. hydrocarbon markets, Permian natural gas may have a rough patch ahead because of constraints on takeaway pipeline infrastructure. If you just look at the raw numbers, that is a bit of a surprise too. After all, there is 10.8 billion cubic feet a day (Bcf/d)

of takeaway capacity out of the Waha hub, epicenter of the Permian natural gas market — with the capability to move gas to market on four primary transportation corridors based on where the supply is headed: west, north, east and to Mexico.

Waha Hub Takeaway Capacity by Corridor (Bcf/d)

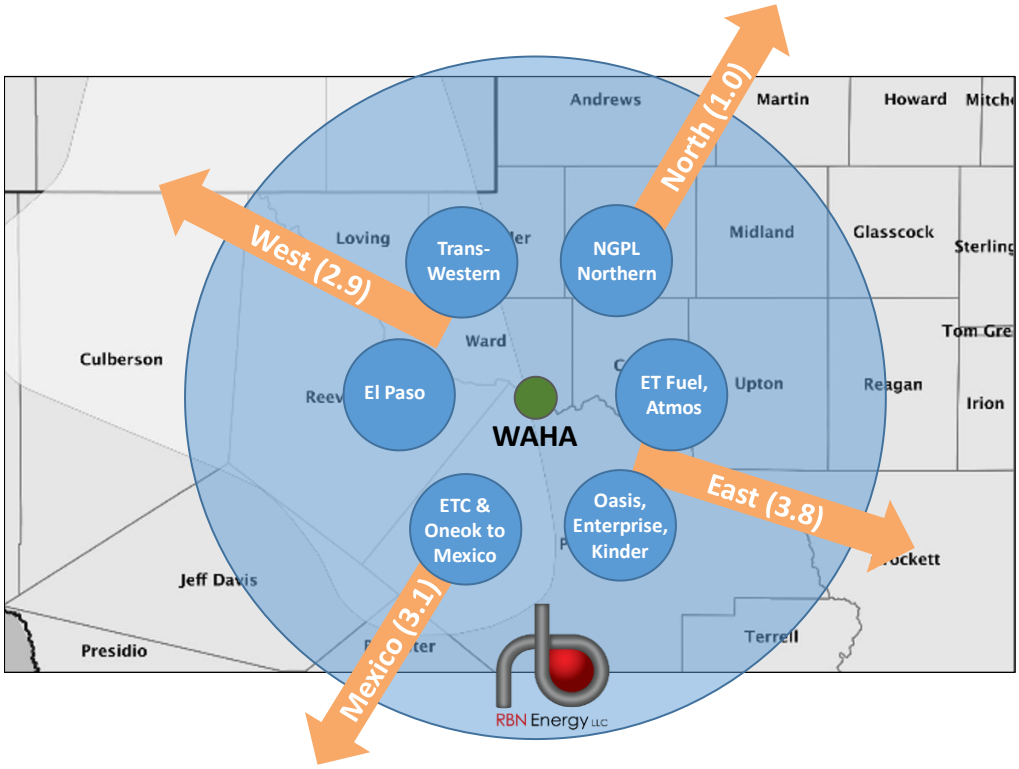

Figure 1- Waha Takeaway Capacity; Source: RBN Energy

Kinder Morgan's El Paso Natural Gas (EPNG) and Energy Transfer Partners' (ETP) Transwestern Pipeline make up the 2.9 Bcf/d of westbound capacity, moving gas to the California border and delivery points in the Southwest and Mexico along the way. Kinder's NGPL and El Paso northbound segment, plus Berkshire Hathaway's Northern Natural Gas (NNG) can move another 1.0 Bcf/d north. Texas intrastate pipelines can take 3.8 Bcf/d southeast to the Houston Ship Channel/Katy area and due east to Dallas/Fort Worth, and recently the Waha Hub has acquired the ability to move gas on a fourth corridor to Mexico via three relatively new pipes: ONEOK Partners' WesTex extension (Roadrunner) and ETP's 1.1-Bcf/d Comanche Trail and 1.4-Bcf/d Trans-Pecos pipelines.

With Permian "dry" (residue) gas production at 6.3 Bcf/d today, you might ask, "What's the problem?" Well, there are at least two serious Permian gas market challenges. First, not all of that existing capacity is usable. For example, almost all of the incremental capacity into Mexico is targeting new gas-fired power generation demand south of the border, much of which has been delayed or is highly uncertain, at least in the near to medium term. If all that new pipeline capacity to Mexico does not get used, it will not do the market much good. West corridor gas has a similar problem during periods of the year when California can generate much of its power needs from hydro, solar and wind, thereby reducing the need for gas there. And gas moving on the North corridor runs head on into Marcellus/Utica gas flowing westward on the Rockies Express Pipeline.

The second challenge for Permian gas could be even more daunting. According to RBN's Growth Scenario, Permian gas production is projected to increase to almost 12 Bcf/d by 2022. As that growth occurs, pipeline takeaway capacity will become increasingly constrained, unless midstream developers bring new pipeline capacity online. By late 2018, natural gas pipeline capacity out of the Permian could become constrained, with those bottlenecks becoming severe enough by 2020 as to require the curtailment of natural gas production if new pipeline capacity is not added. That has serious implication for crude oil. While crude can be moved by truck and rail if pipeline capacity is constrained, no such alternatives to pipeline are available for natural gas. Since almost all natural gas production is associated with crude oil production, the implication is that both crude and natural gas production would need to be reduced, either by curtailing drilling or even shutting in production. This is the reason why constrained gas takeaway capacity is a bigger threat to crude production than is constrained takeaway capacity on crude oil pipes.

Fortunately for Permian producers, several midstream companies are promoting new takeaway pipelines. NAmerico Partners is planning the 1.85-Bcf/d Pecos Trail Pipeline from the Permian's Delaware and Midland basins to the Agua Dulce gas hub near Corpus Christi. Kinder Morgan is planning the 1.7-Bcf/d Gulf Coast Express along a similar route, and Enterprise Products Partners is eyeing another Permian-to-Corpus project. Unfortunately, these pipelines are not expected to be online until 2019.

How bad could Permian gas takeaway capacity constraints become over the next few years? Will projects that have been announced be online soon enough to prevent major Permian gas price aberrations? What happens if crude oil prices increase to levels that stimulate even more drilling and consequently result in even faster production growth?

To fully answer these questions, it is important to develop a comprehensive understanding of the infrastructure that is in place today, the current utilization rates of that infrastructure, the expected rate of production growth and the potential impact of proposed new takeaway capacity projects in the region. This RBN Drill Down Report is the second in a series of Permian assessments, this time focusing on the natural gas market. In it, we examine each of the nine pipelines that have traditionally provided natural gas takeaway capacity out of the Permian: El Paso, Transwestern, Northern Natural, NGPL, ET Fuel, ET Oasis, Enterprise Texas, Atmos, and Kinder Morgan Texas. Our analysis includes an outline of the owner, origin, destination, capacity, and a map of each pipeline system. We also review the three more recently developed projects to move Permian gas to Mexico: Roadrunner, Comanche Trail and Trans-Pecos. With this analysis as a foundation, we then review potential capacity additions from three projects described above. Based on our assessment of existing and potential takeaway capacity, we then consider what these gas market developments mean for Permian prices and the ultimate risk of production curtailments.

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