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Hot Legs!

Crude Oil Shuttle Pipelines and Gathering Systems in the Permian



- **Destination optionality is becoming increasingly important to Permian producers to help ensure they are getting the highest possible price for their product.**
- **New regional networks of pipes are being developed to gather and shuttle crude to takeaway pipelines. In many cases, these systems are designed to give producers and other shippers access to two or more takeaway pipes.**
- **Eleven new shuttle and hybrid systems totaling approximately 1.9 MMb/d of new Permian capacity are either already flowing or are in development. Most of these systems have the capacity for further expansion.**
- **Another seven Permian gathering systems either have recently come online or are expected to start up soon.**
- **As crude oil connectivity across the Permian continues to improve, trading locations in the basin will gain in importance as both transactional hubs and pricing benchmarks.**

1. Introduction

As crude oil production continues to ramp up in the Permian, producers in the red-hot play are faced with difficult choices among pipeline takeaway capacity alternatives. Some pipes are express lines that move barrels from the Permian to a single market, while others offer destination optionality, thereby providing access to multiple regional markets. As values across the Permian, U.S. oil hubs, and the global crude landscape continue to shift, such destination optionality is becoming increasingly important to producers to help ensure they are getting the highest possible price for their product.

For example, consider current Permian crude market conditions. So far in November 2017, Permian producers able to access Gulf Coast crude oil markets have been able to realize \$61/bbl. Those forced to sell into the local Midland, TX, market have been stuck with little better than \$56.50/bbl. Even if it costs \$4/bbl to transport crude from Midland to the Gulf Coast (a full-cost committed shipper rate), the producer is still \$0.50/bbl better off moving barrels directly to Houston. And either local sales or transport to the Gulf Coast is a better alternative than paying \$0.75/bbl to get to the crude oil storage and distribution hub in Cushing, OK, and selling for the current Cushing price: only \$56/bbl, or \$1.25/bbl lower than Midland on a netback basis. Price differentials have favored the Gulf Coast since early September. But things have been quite different in the not too distant past. For example, in January 2017, after adjusting for transportation

costs, selling on the Gulf Coast was \$4.00/bbl worse than selling in Midland, and \$3.00/bbl worse than selling in Cushing.

Such significant shifts in the value a producer can realize in one market versus another are par for the course in all growing basins, resulting from constantly changing transportation capacity constraints and the ensuing impact on regional price differentials. There is a clear implication for producers in these markets, namely that there is a significant value in having the option to move barrels to the market with the highest netback to the wellhead in any given set of market conditions. The ability to transport Permian crude to two end points — say, Cushing or Houston — is good, and the ability to access even more markets (Corpus Christi, Nederland/Port Arthur, etc.) is even better.

The importance of destination optionality can be explained by a brief historical review of the development of takeaway pipelines out of the Permian. Before the Shale Era, most of the oil produced in the Permian flowed north to Cushing on either the Plains All American's Basin Pipeline or Occidental Petroleum's (Oxy) Centurion Pipeline. Only Energy Transfer Partners' West Texas Gulf Pipeline ran to the Gulf Coast, and back then the pipe's capacity was much smaller than it is now. At their origination points in the Permian, the Basin and Centurion systems each have a number of tentacles that connect directly with Permian gathering systems and truck terminals, and the networks worked well to move Permian production to the higher-value Cushing market.

But the Shale Revolution changed everything. By 2011-12, surging crude production in the Bakken plus imports of heavy crude oil from western Canada exceeded Midwest refinery demand, and because there was very little pipeline capacity from the Midcontinent to the Gulf Coast (where half of all U.S. refining capacity resides) supplies started backing up in Cushing. The Cushing supply glut — exacerbated by rising shale production in the Permian itself — resulted in heavy discounting for Cushing benchmark West Texas Intermediate (WTI) versus Light Louisiana Sweet (LLS) at the Gulf Coast. In 2011, WTI at Midland (the heart of the Permian) was selling for \$18/bbl less (on average) than LLS at the Gulf, and in 2012 that differential increased to \$22/bbl.

To relieve the crude logjam at Cushing, midstream companies developed new Permian-to-the-Gulf pipeline capacity (shown in Figure 1), including the reversal of Energy Transfer's small Amdel Pipeline in 2012 and Magellan Midstream Partners' larger Longhorn Pipeline in 2013, followed by the construction of Magellan and Plains' BridgeTex Pipeline (2014), Plains' Cactus Pipeline and Energy Transfer's and ExxonMobil's Permian Express II (2015 for both), and Plains' and ExxonMobil's PELA Pipeline (2016).

Today, with all this takeaway capacity in place — and more being built, including Enterprise's new, 450-Mb/d Midland-to-Sealy pipeline to the Houston area, whose operation is being ramped up now — Permian producers and shippers have the opportunity to reach more than one regional end-use market, but only if they can transport their crude from the lease to two or more takeaway pipelines that in turn can move the crude to two or more of those markets.

It also should be emphasized that while most of the new takeaway pipeline capacity out of the Permian is aggregated in Texas towns on the eastern (Midland Basin) side of the play — places like Midland, Big Spring, Crane, Colorado City, McCamey or Garden City — many of the multi-stacked, hydrocarbon-packed production areas that are the focus of drilling today are located scores of miles away to the west in the Delaware Basin.

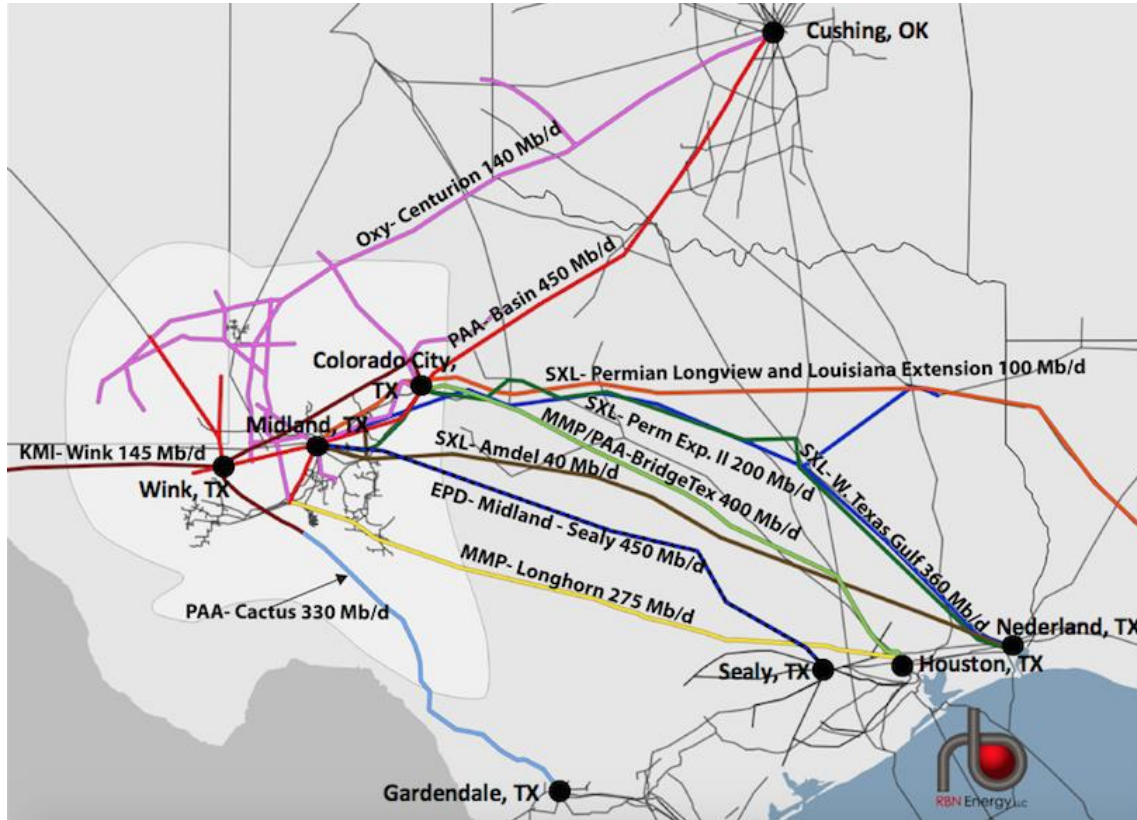


Figure 1 - Takeaway Pipelines Out of the Permian; Source: RBN

As crude oil production has ramped up in the Delaware and other high-growth parts of the Permian over the past few years, new regional networks of pipes have been built to gather and shuttle crude to takeaway pipelines. In many cases, these pipelines are designed to provide that all-important destination optionality. This report details many of the key gathering systems and shuttle pipelines systems providing this capability to the Permian market.

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