Cushing Builds as Gulf Coast Tanks Drain

Rising production and pipeline imbalance weigh on Midwest hub.

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Data Sources for This Publication
U.S. Energy Information Administration
CME Group
To discover more about the data sources used, click here.

Total Stocks Fall

The Energy Information Administration weekly petroleum summary data from Feb. 27 showed a week-on-week increase of 1.7 million barrels in crude stocks at the Midwest Cushing, Oklahoma, trading hub that is home to the CME NYMEX West Texas Intermediate futures contract. Cushing inventories have been rising since September 2018 but slowed in the first month of 2019 before taking off again recently—jumping 5.5 million barrels or 13% since the end of January to 46.7 million barrels as of Feb. 22, 2019. The latest jump in Cushing stocks comes while total U.S. crude stocks fell 8.6 million barrels last week mostly as a result of lower crude imports and increased exports out of the Gulf Coast region. This note looks at the drivers behind rising Cushing inventories.

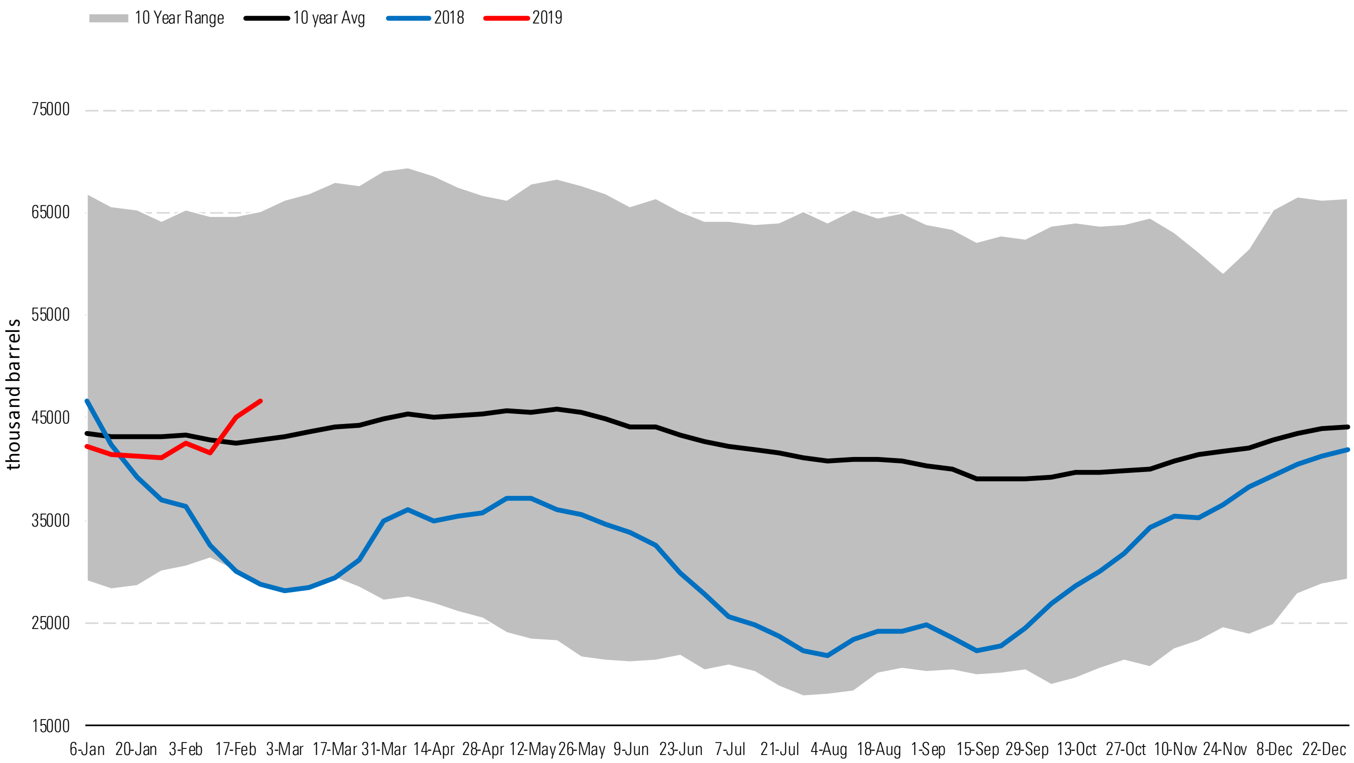
Staging Point

Inventory levels at Cushing indicate the supply demand balance in the Midwest and remain an important driver for U.S. benchmark WTI light sweet crude that is delivered into the hub from the Permian basin in West Texas. The Cushing hub has a large network of interconnected storage tanks with about 77 million barrels capacity as of September 2018, according to the latest EIA annual survey. The storage hub is used as a staging point to manage flows of crude from Canada as well as domestic production in the Rockies, North Dakota, and the Oklahoma Anadarko basin to refineries in the Midwest and the Gulf Coast. Cushing is one corner of what we have dubbed the "Permian Triangle" of pipelines connecting crude production gathered at Midland, Texas, with demand centers in Cushing, Oklahoma, feeding Midwest refineries, and Houston, Texas, feeding Gulf Coast refineries and increasingly, the export market (see our July 2018 note "The Permian Triangle and U.S. Crude Dynamics"). Last week's EIA supply report showed a build of crude stocks in Cushing during the same week that a significant 6.7 million barrel draw occurred at the Gulf Coast. That led us to contemplate why crude inventories would be building at Cushing at the same time they are drawing at the Gulf Coast?

Cushing Build

Exhibit 1 shows Cushing crude inventories on a seasonal basis over the past 11 years. The grey shaded area covers the range of inventory levels over the 10 years prior to 2019. The black line is the 10-year average, the blue line is 2018, and the red line is 2019. The chart shows a large inventory build at Cushing in the last quarter of 2018 starting just before crude prices collapsed at the beginning of October. Cushing inventories increased by 20 million barrels or 88% between mid-September and year-end, but the rate of increase slowed at the end of 2018. This year (red line) Cushing stocks remained level to slightly lower in January before taking off again in February.

Exhibit 1 Seasonal Cushing Crude Inventory



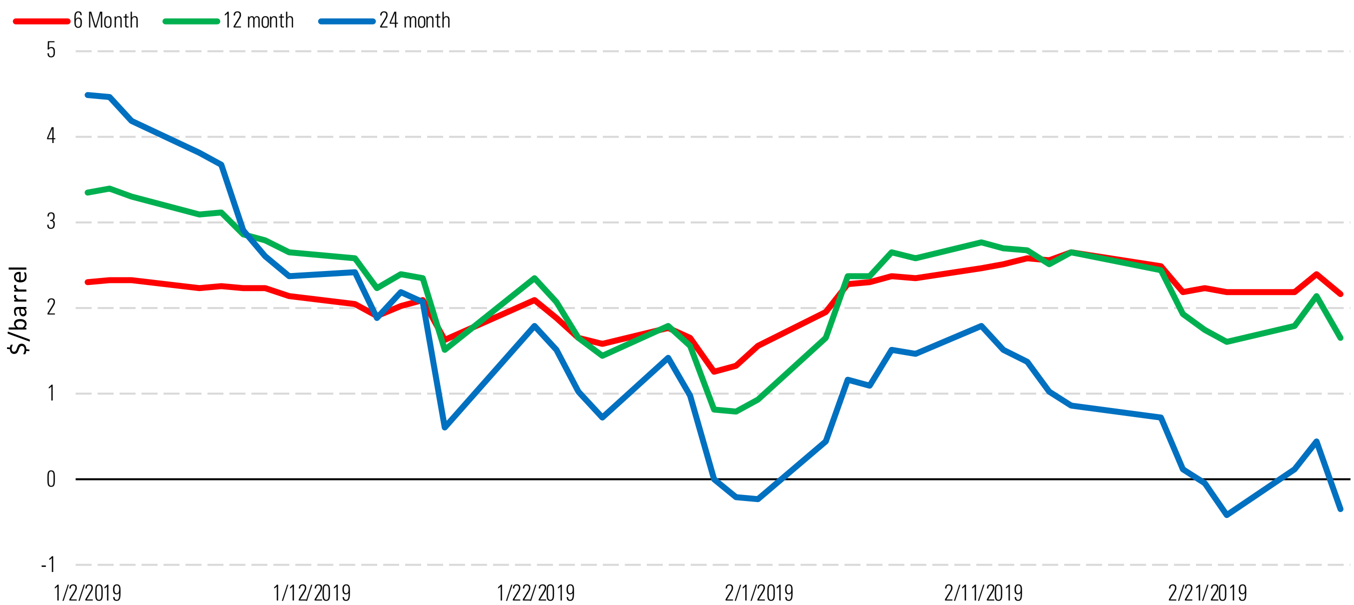
Source: EIA, Morningstar

Weak Contango Signal

One reason for inventories to grow is when prices for forward deliveries are higher than today—a market structure known as contango that encourages storage over immediate sales. The opposite of contango is backwardation—where prices are lower in the future—encouraging sales sooner rather than later and discouraging storage.

The CME NYMEX WTI futures market moved into a contango structure in October and November of 2018 after prices collapsed amid concerns about an oversupplied market. The contango peaked at New Year's when the spread between prices 24 months into the future and the nearby contract reached $4.49/bbl on Jan. 2, 2019 (blue line in Exhibit 2). Since then, the contango has narrowed for both 12- (green line) and 24-month out spreads to prompt. However, the 6-month contango (red line) increased during the first half of February to peak at $2.65/bbl on Feb. 15, 2019, falling back to $2.19/bbl on Feb 25. Further out on the curve, the 24-month contango had virtually disappeared and the 12-month narrowed to $1.78/bbl by Feb. 25. So, although the current contango curve shape provides reason to store crude over the next six months, that disappears over the longer term. In the circumstances it seems February's Cushing inventory build is not fully explained by a weak contango signal in the WTI futures market. In any case if there is a contango signal, it's being ignored at the Gulf Coast, where inventories dropped by 6.7 million barrels last week.

Exhibit 2 WTI Futures Market Contango 2019



Source: CME Group, Morningstar.

Pipeline Imbalance

We believe recent Cushing inventory builds are instead the result of an increase in incoming crude supplies to the Midwest hub compared with takeaway capacity. According to RBN Energy, current Cushing inbound pipelines have 3.7 mmb/d capacity while outbound pipes only offer 3.1 mmb/d throughput. This equation points to an inventory build whenever incoming supply exceeds takeaway capacity. That is becoming an increasing problem at Cushing as U.S. domestic production continues to hit new records—estimated at 12.1 mmb/d by the latest EIA weekly report - since a good deal of that new supply ends up passing through the Oklahoma hub.

Since the end of last year there's been an increase in crude shipments into Cushing from the Permian on the newly opened Plains Sunrise Expansion pipeline that added 500 mmb/d of capacity out of Midland with at least 120 mmb/d directed into Cushing. Crude production data from basins upstream of Cushing also suggest increasing volumes coming into the Midwest hub. EIA estimate output in the North Dakota Bakken increased 220 thousand barrels/day to a record 1.45 million barrels/day during the year to March 2019 and output from the Rockies Niobrara basin was up 119 mmb/d over the same period. Although Bakken production can bypass Cushing on the DAPL pipeline, that route only carried 470 mmb/d until a 100 mmb/d expansion came online last week and large volumes of Bakken crude as well as Niobrara output do reach Cushing via pipelines from the Rockies. The close-by Oklahoma Anadarko basin STACK and SCOOP plays increased output by 13% or 67 mmb/d in the past year, the majority flowing direct to Cushing. In addition to domestic production, the flow of Canadian crude into the U.S. from north of Cushing hit a record 4 mmb/d in the week of Jan. 18, 2019, before suspected leaks in the Keystone pipeline system caused volumes to fall. Although most Canadian crude is consumed in the Midwest, increasing volumes are moved through Cushing to the Gulf Coast.

Slow Relief

As crude flows increase inbound pressure on Cushing, relief from new outbound pipes has been slow to arrive. The 200 mmb/d Plains/Valero Diamond pipeline between Cushing and Memphis, Tennessee, that opened in December 2017 was a notable exception. As mentioned above, a 100 mmb/d expansion to the Energy Transfer DAPL pipeline this month (February) provides indirect relief to Cushing. Enterprise Product Partners and Enbridge are in the process of expanding capacity between Cushing and Houston on the Seaway pipeline by 100 mmb/d in March 2019 by adding drag-reducing agents to improve throughput.

To correct the existing imbalance and handle future growth, a number of new pipeline projects have been touted for service in 2020 and beyond that would increase outbound deliveries from Cushing. Enterprise and Enbridge have discussed plans to increase Seaway capacity by another 250 mmb/d once Enbridge's Line 3 is expanded across the border from Canada. Magellan and Navigator Services have announced the 300 mmb/d Voyager pipeline from Cushing to Houston that would come online by the end of 2020. Phillips 66 has announced the 400 mmb/d Red Oak project between Cushing and Houston/Beaumont, Texas, in late 2020. The SemGroup and DCP Midstream has announced the 300 mmb/d Gladiator project between Cushing and Houston that would carry crude originating in the Rockies and come online in the third quarter of 2020. And lastly, Tallgrass has announced the 800 mmb/d Seahorse pipeline between Cushing and the Louisiana Gulf Coast, expected online by the third quarter of 2021 that would connect with an expansion to its existing pipeline from the Denver Joules basin in the Rockies. These additions add up to over 2 mmb/d of incremental outbound capacity from Cushing, relieving any existing bottlenecks during the coming two to three years.

In the meantime, expect Cushing to experience continued inventory builds as incoming crude exceeds takeaway capacity, particularly with Midwest refinery demand slowed by maintenance this month. And we do not expect builds in Cushing to be matched by Gulf Coast inventories as exports continue to drain stocks in that region and imports are reduced by OPEC cuts and the Venezuela crisis.

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