

ROCKIES & BAKKEN IN FOCUS

PREVIEW | FundamentalEdge Report | February 2020

 ENVERUS



Contents

Introduction and Key Takeaways	3
US Breakevens – How do Rockies and Bakken Stack?	4
Rockies and Bakken 2020 Activity Levels	5
Producer-Level Breakevens by Tier	6
Rockies and Bakken EURs Over Time	7
Permits and Rig Count	8
Bakken	9
Production Scenarios	10
Production vs. Takeaway	11, 13, 15
Midstream Maps	12, 14, 16
Rockies	17
Production Scenarios PADD 4	18
Production vs. Takeaway	19, 21, 23
Midstream Maps	20, 22, 24

Introduction and Key Takeaways

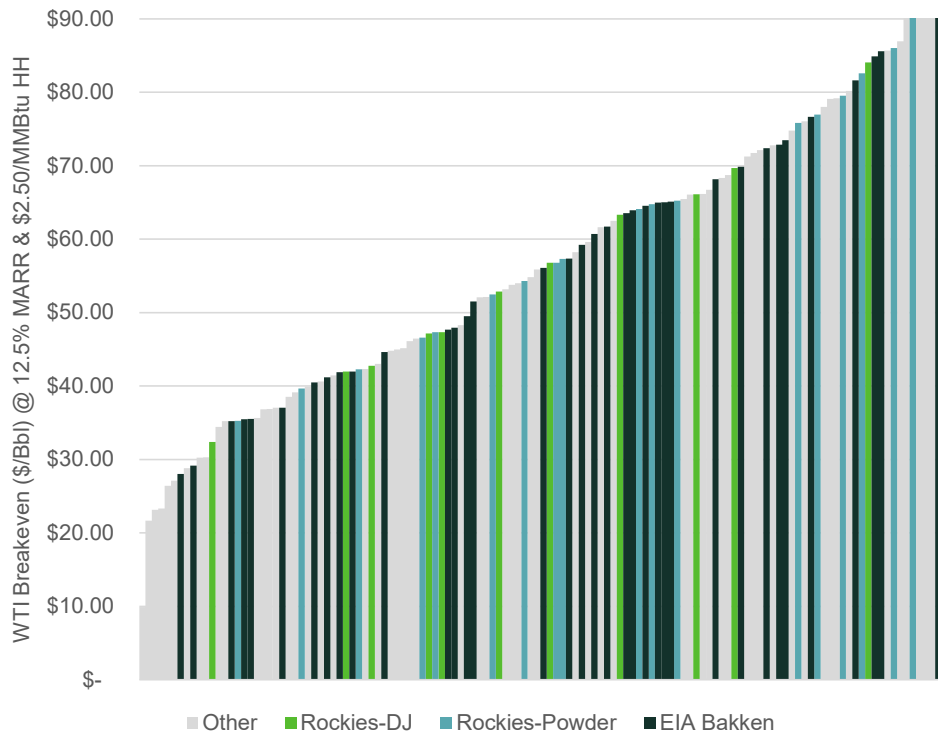
- **Rockies & Bakken in Focus** is the February 2020 installment of the Enverus FundamentalEdge Series. This report reviews upstream and midstream activity in these two key basins.
- **Crude oil** production in the Rockies and Bakken made gains in 2019 compared to 2018, but growth has slowed to a crawl in recent months amid lower prices and emerging takeaway constraints. In our view, this low-growth outlook for production is likely to persist through 2020 based on operator guidance and current drilling and completion trends. Significant increases in outbound pipeline capacity are in the works for early to mid-2021, with the planned expansion of the Dakota Access pipeline and the start of the Liberty pipeline from Guernsey to Cushing. Both pipelines' additions as well as modest gains to capacity on the existing Pony Express pipeline, bode well for differentials next year, but right now pipelines ex-Guernsey remain constrained, and Bakken is pricing lower alongside competing Western Canadian grades.
- **Natural gas** breakeven costs to produce in the Rockies and Bakken are well above current Henry Hub prices and typically north of \$3.00/MMBtu. Therefore, any production gains in these plays are purely coming from associated production. The Rockies, a traditional gas play, will be able to offset some of the declines from gas-directed plays with increases from oil-directed activity in the Denver-Julesburg (DJ) and Powder River. However, the region is expected to see a net production decline over the next five years, while very small gains are expected from the Bakken, also thanks to oil-directed activity.
- **Natural gas liquids** production in the Williston and Rockies increased during 2019, but the growth is expected to slow in 2020. Williston Y-grade production is expected to grow between 2019 and 2024, with most of the growth being shipped to the Rockies via the new Elk Creek pipeline. However, the amount of growth will be reliant on crude prices. While Front Range Y-grade production is expected to remain relatively flat between 2019 and 2024, much-needed takeaway capacity in Elk Creek and White Cliffs was added to the region, providing an outlet for imported volumes from the Williston.

US Breakevens – How do Rockies and Bakken Stack?

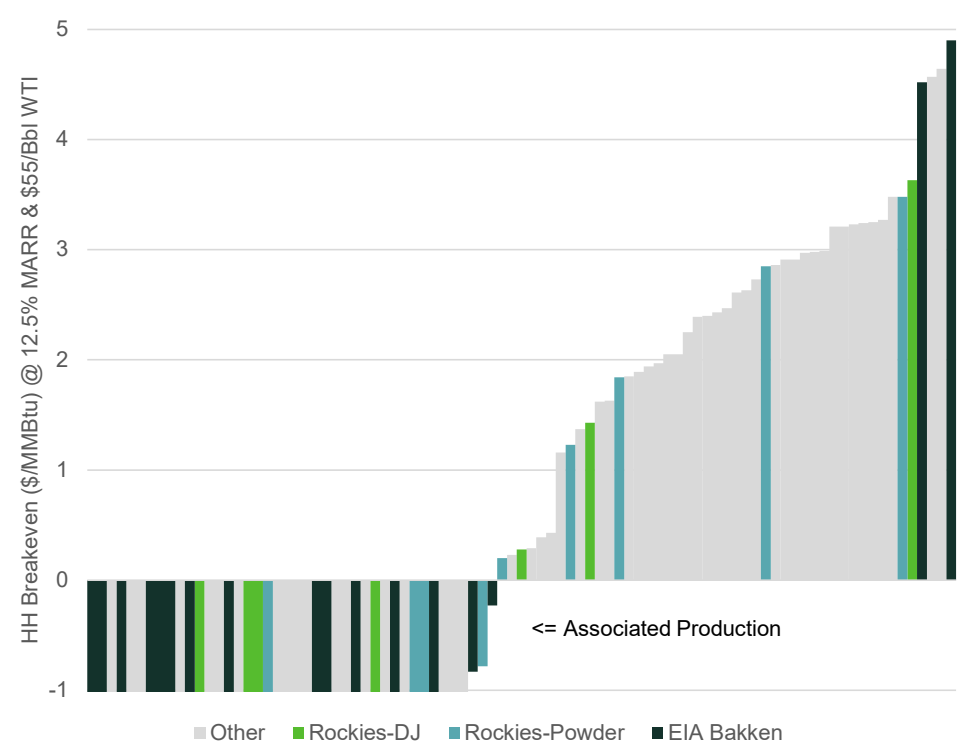
Both the Rockies and Bakken are more competitive producing crude oil than natural gas. Hence, E&P activity in these basins is almost exclusively oil directed.



Crude Oil Breakevens – WTI (\$/Bbl)



Natural Gas Breakevens – Henry Hub (\$/MMBtu)



Rockies and Bakken 2020 Activity Levels

The Rockies and Bakken will likely see a net production increase from these producers in 2020, attributable to cost savings, efficiencies, and higher oil percentages.

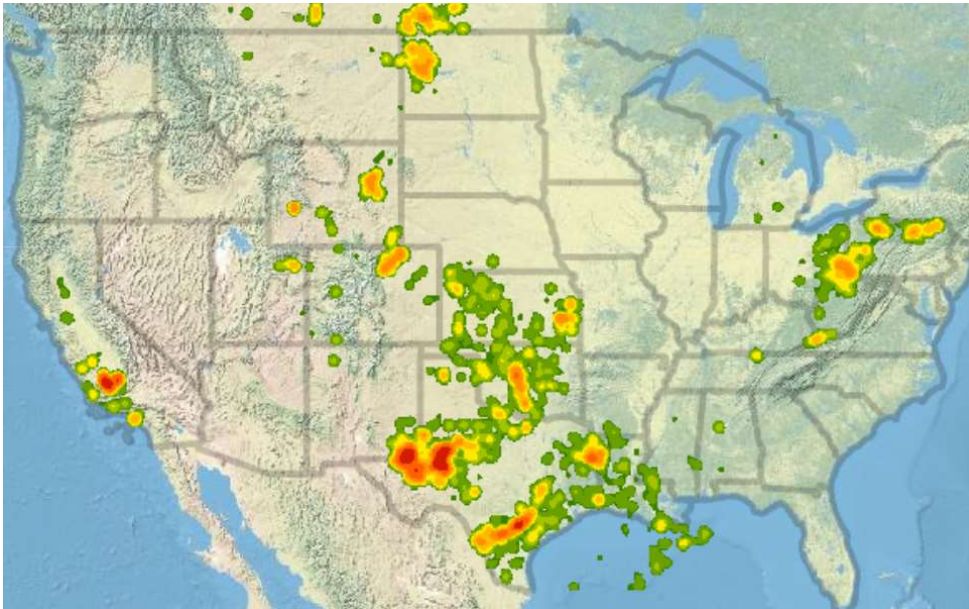


DI Basin	Company	2020 Activity	Net 2020 Production +/-
Bakken	Conoco	at optimal plateau, which is higher than initially expected at 90-100 bbl/d	Flat
Bakken	Continental	dropped 7 rigs in Mid-Con in 2019, with limited rig fluctuation in Bakken (6); type curves and rig count remain constant with steady sequential growth	Flat
Bakken	Enerplus	had "very active" completions program in summer with strong liquids growth, but 0 wells online in Q4'19; a focus on share repurchases limits upside to production growth	Flat/Light Growth
Bakken	Equinor	light activity in Bakken	Flat
Bakken	Exxon	Permian takes center stage, but Bakken still contributing to production growth until ~2023	Flat/Light Growth
Bakken	Hess	ramped up Bakken in 2019 with \$1.4B and 20% CAGR to plateau at 200 MBoe/d in 2021 (~140 in 2019); still considered a growth engine	Growth
Bakken	Marathon	20% cost savings in Bakken from 2018; planning to allocate more than the typical 60% of capital to EF and Bakken in 2020, which will drive oil production growth	Growth
Bakken	Oasis	focusing on efficiencies in Bakken with combined portfolio expected to have slightly higher production by Q4'20 from Q4'19	Flat
Bakken	QEP	expecting flat production 130-150 in Bakken, 8 million barrels per annum, but volumes oscillating	Flat
Bakken	Whiting	running 4 rigs, beholden to free cash flow	Flat
Bakken	WPX	shifting some activity to Delaware after Felix acquisition; dropping 3rd Bakken rig in Q3'20	Flat
DJ	Bonanza Creek	moderated production growth with cash flow neutrality ahead with 1-rig plan	Flat/Light Growth
DJ	Enerplus	turned 5 wells on in DJ in Q3'19	Flat
DJ	Extraction	guidance down 11% from 2019 levels; production to rise 12-15 MBoe/d from Q3'19 levels	Growth
DJ	HighPoint	small amount of capital likely, with borrowing base reduction needed	Flat
DJ	Noble	record Q3'19 DJ volumes; more to come in 2020 with North Wells Ranch CDP, armed with well cost savings and efficiencies	Growth
DJ	Occidental	reducing DJ capex by \$500M, \$105M of which stems from D&C savings; moderating production growth from 10% to 5% in 2020	Flat/Light Growth
DJ	PDC	preliminary plans with SRCl included add 4% capex growth at midpoint	Flat/Light Growth
DJ	Whiting	no plans for additional development activity in Redtail	Down
Powder	Chesapeake	significantly reduced 2020 plans with debt payments looming; 25% of 2020 program targeting Niobrara (net ~\$100M-\$150M less than 2019) with companywide oil expected to be flat	Flat
Powder	Devon	potentially doubling PRB activity in 2020; 7%-9% oil growth in 2020; expecting 70% oil growth from Q4'19 to 2019 exit	Growth
Powder	EOG	expecting growth but limited by infrastructure	Growth

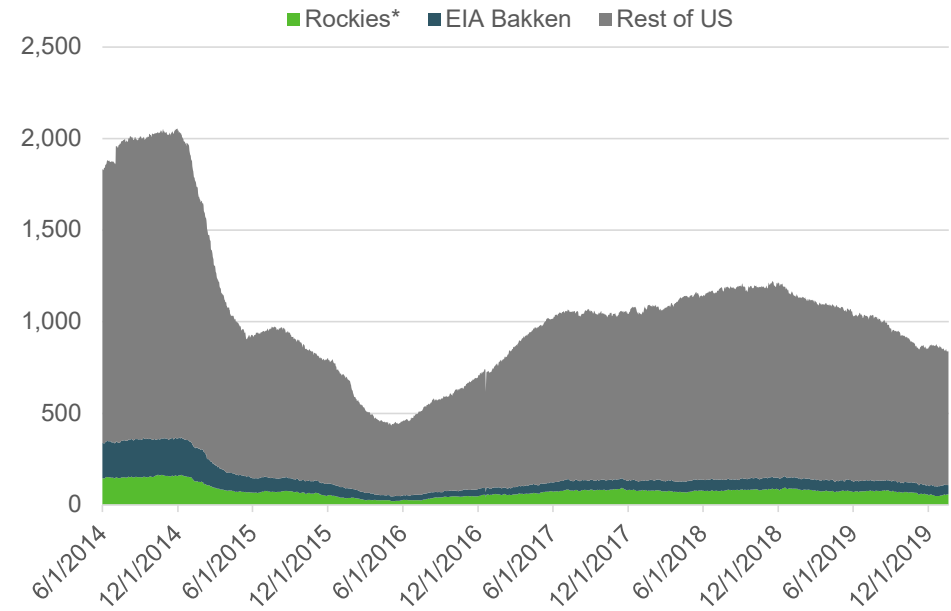
Permits and Rig Count

E&P activity continues in both the Rockies and Bakken, but on a lesser scale compared to other basins like the Permian, Anadarko, and Gulf Coast (Eagle Ford).

Permit Heat Map – Last 90 days

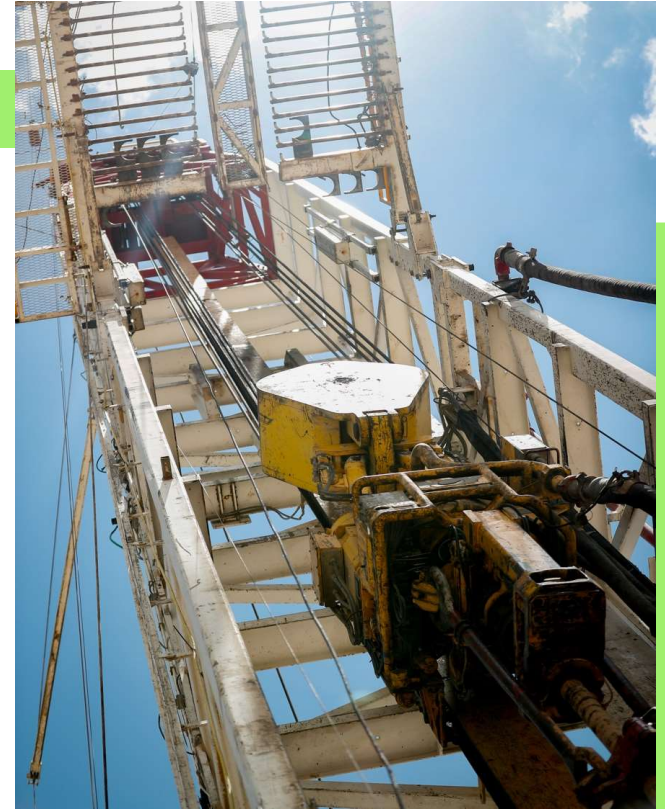


Rig Count



* Rockies basins: DJ, Powder River, Uinta, Green River-Overthrust, Piceance

BAKKEN

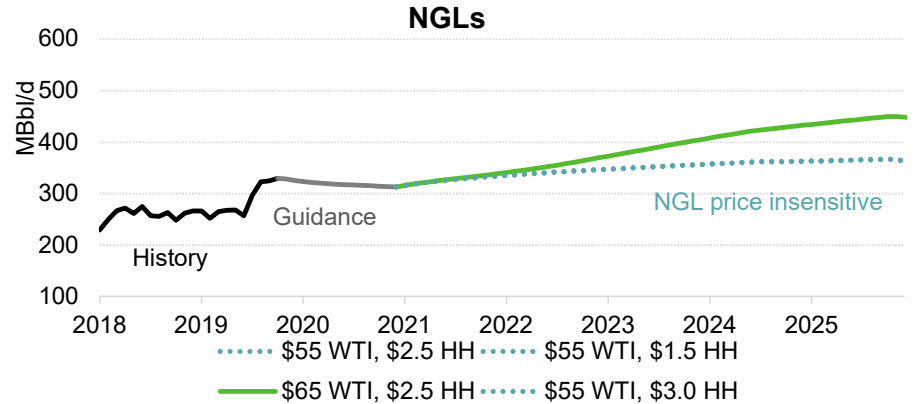
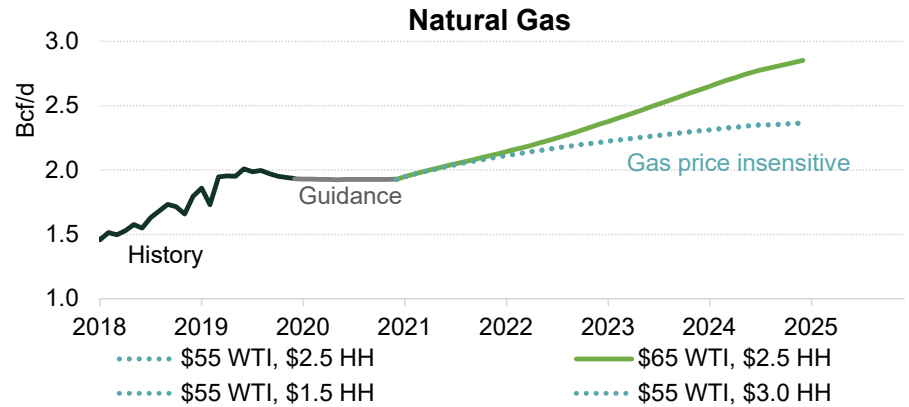
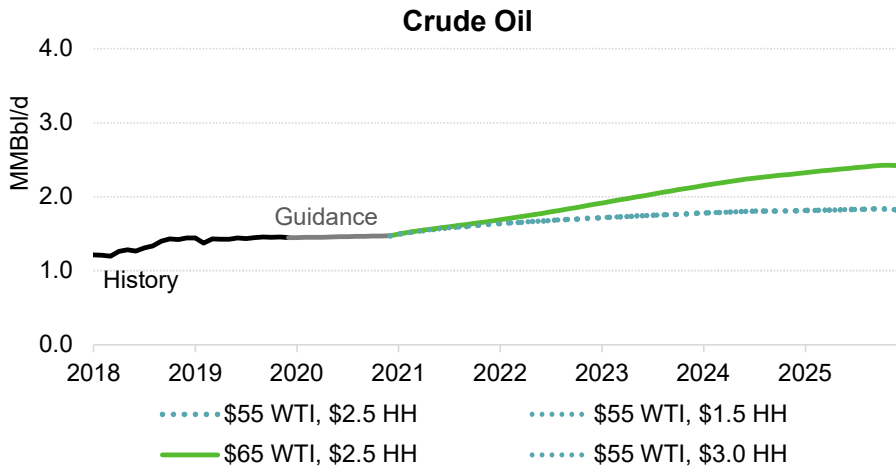
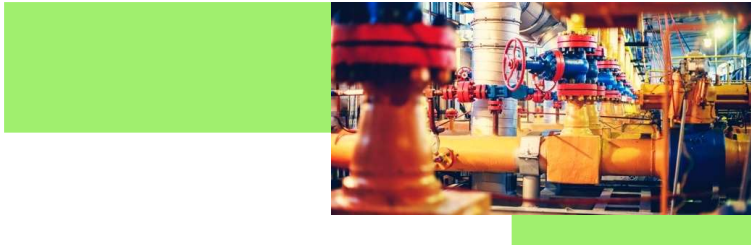


Production Scenarios

Bakken **crude** production has flatlined at around 1.5 MMBbl/d given the lower drilling activity of late. Operators are focusing on living within cashflow, and this is having an impact on production growth. Modest increases are possible in 2021-2024 with a \$55/Bbl WTI price environment, but prices in excess of \$65/Bbl would be required to lift production above 2 MMBbl/d during this timeframe.

Bakken **gas** production is insensitive to natural gas prices. As shown in the natural gas chart, changes in gas prices between \$1.50 and 3.00/MMBtu leads to the same production forecast over the next five years. However, oil prices do impact natural gas production. A \$10 increase in WTI prices (\$55 vs. \$65/Bbl) can add 0.49 Bcf/d of dry gas production by the end of 2024.

Bakken **NGL** production remains flat at \$55/Bbl WTI price, regardless of gas price fluctuations between \$1.50 and \$3.00/MMBtu. Crude price will drive future NGL production in the Bakken.



Production vs. Takeaway: Crude Oil

Although the Williston basin has ample takeaway capacity on paper, not all end markets depicted in the chart offer desirable netbacks.

With the Dakota Access Pipeline (DAPL) effectively full, capacity ex-Guernsey constrained, and crude-by-rail to Puget Sound refiners capped by new regulation, barrels have needed to clear into the Upper Midwest market at increasing discounts to Cushing due to depressed prices for competing Canadian grades. This has led to an increase in spot rail movements in recent months.

Stuck between a rock and a hard place for now, the situation will change in 2021 with the expansion of DAPL. Capacity on DAPL is currently 570 MBbl/d but could rise up to 1.1 MMBbl/d after Energy Transfer boosts pumping capacity on the line.

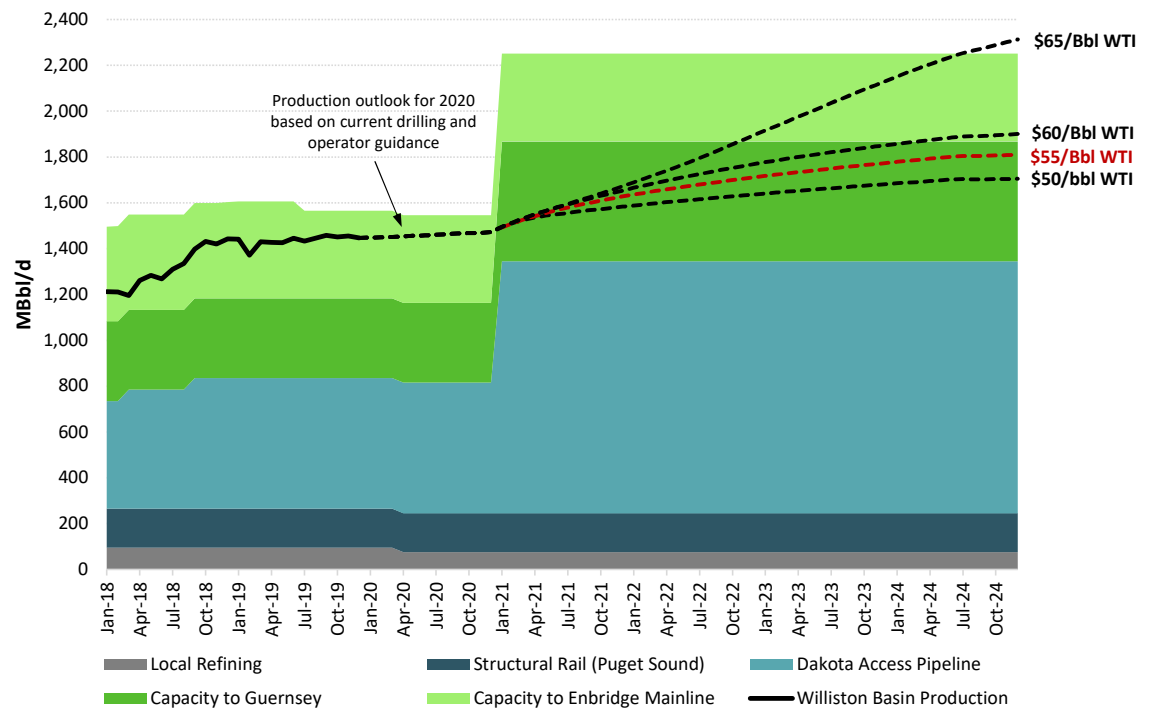
Rockies constraints will also be eased with the start of the Liberty pipeline in 2021. As part of its JV with Phillips 66, privately held Bridger Pipeline (which owns the Butte/Belle Fourche/Bridger system) will increase capacity out of the Williston basin by approximately 175 MBbl/d.

Such a large increase in capacity coming online at the same time risks overshooting supply. Under Enverus' base case forecast of Williston basin production (assuming \$55/bbl WTI), there would not be enough crude to fill all pipelines leaving the basin.

Given the sticky nature of minimum volume commitments, the increase in DAPL capacity would likely lead to a steep drop in noncommitted volumes on the Enbridge North Dakota and Bakken pipelines and strengthen differentials in the field.

This may be a desirable outcome for Enbridge: with capacity out of Western Canada constrained, Enbridge has been optimizing its Mainline/Lakehead systems to allow for incremental Canadian volumes. Enbridge also has a 27.6% interest in the DAPL/ETCOP system through a JV with Marathon Petroleum.

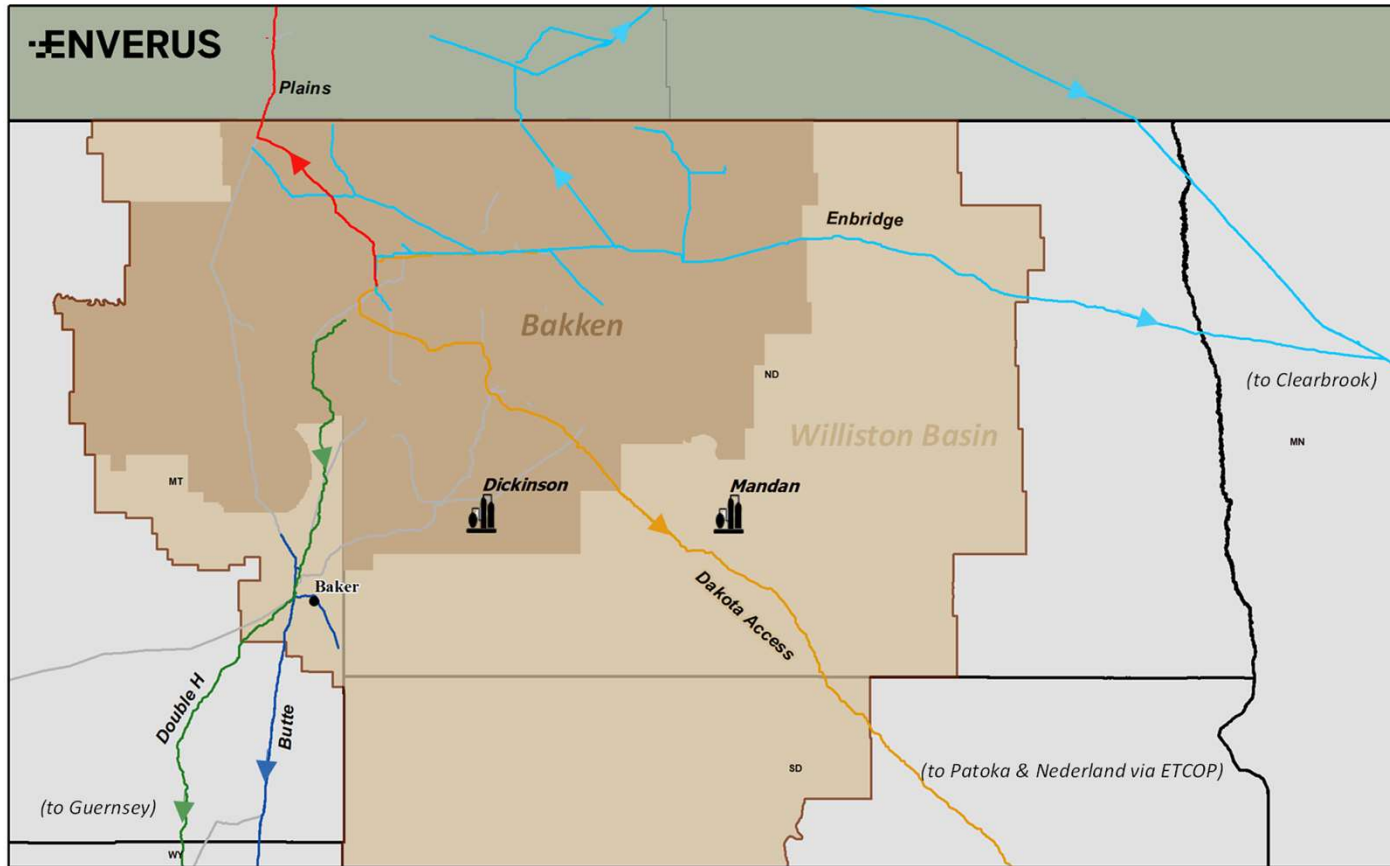
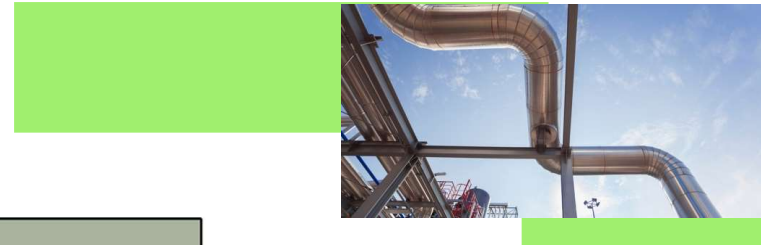
Williston Basin: Crude Production vs. Outbound Pipeline Capacity & Local Refining



Notes:

- (1) All production scenarios assume \$2.50/MMBtu Henry Hub minus transportation costs.
- (2) Local refining represents the sum of atmospheric distillation capacity at the Mandan and Trenton refineries.
- (3) Capacity to Enbridge Mainline represents the sum of capacity on the Enbridge North Dakota and BPEP pipelines.
- (4) Capacity to Guernsey represents the sum of capacity on Double H and Butte ex-Williston Basin.

Midstream Map: Crude Oil



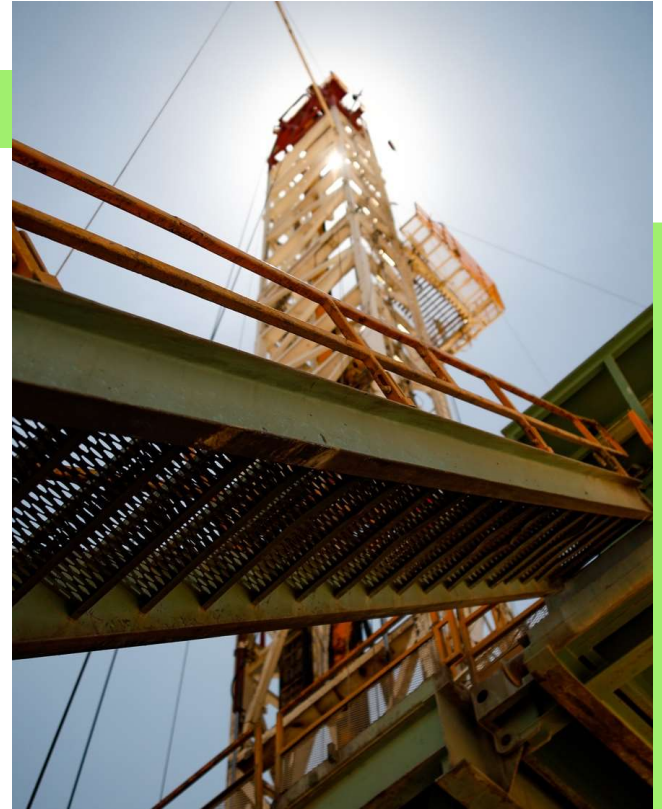
Current Capacity

Pipelines	MBbl/d
Dakota Access	570
Butte	260
Enbridge North Dakota	238
Enbridge Bakken	145
Double H	88
Plains North (idle)	40

Refineries	MBbl/d
Marathon Mandan	71
Marathon Dickinson*	19

* Dickinson to be converted to biodiesel refinery by December 2020.

ROCKIES



Production vs. Takeaway: Natural Gas

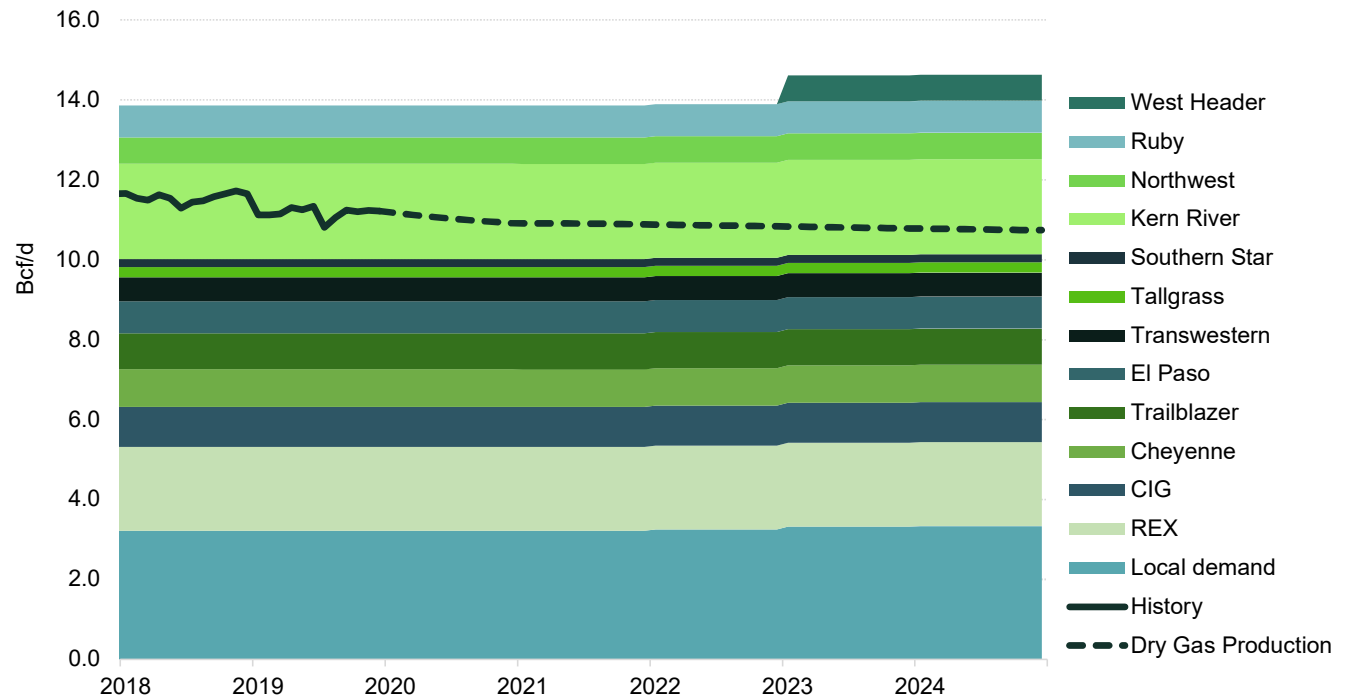
Dry natural gas production in the Rockies is expected to remain under 12 Bcf/d over the next five years. This compares to 14.4 Bcf/d reached on February 2009 when natural gas prices averaged \$3.94/MMBtu.

Production is expected to go from 11.6 Bcf/d in 2018 to 10.8 Bcf/d in 2024, a decrease of 0.8 Bcf/d. The declines in the Rockies are led by San Juan (-0.4), Green River-Overthrust (-0.3), Piceance (-0.3), Wind River (-0.2), and Uinta (-0.1). Some of these declines are getting offset by wet basins, where oil-directed drilling will bring associated gas production growth. These basins are Denver-Julesburg (+0.44) and Power River (+0.13).

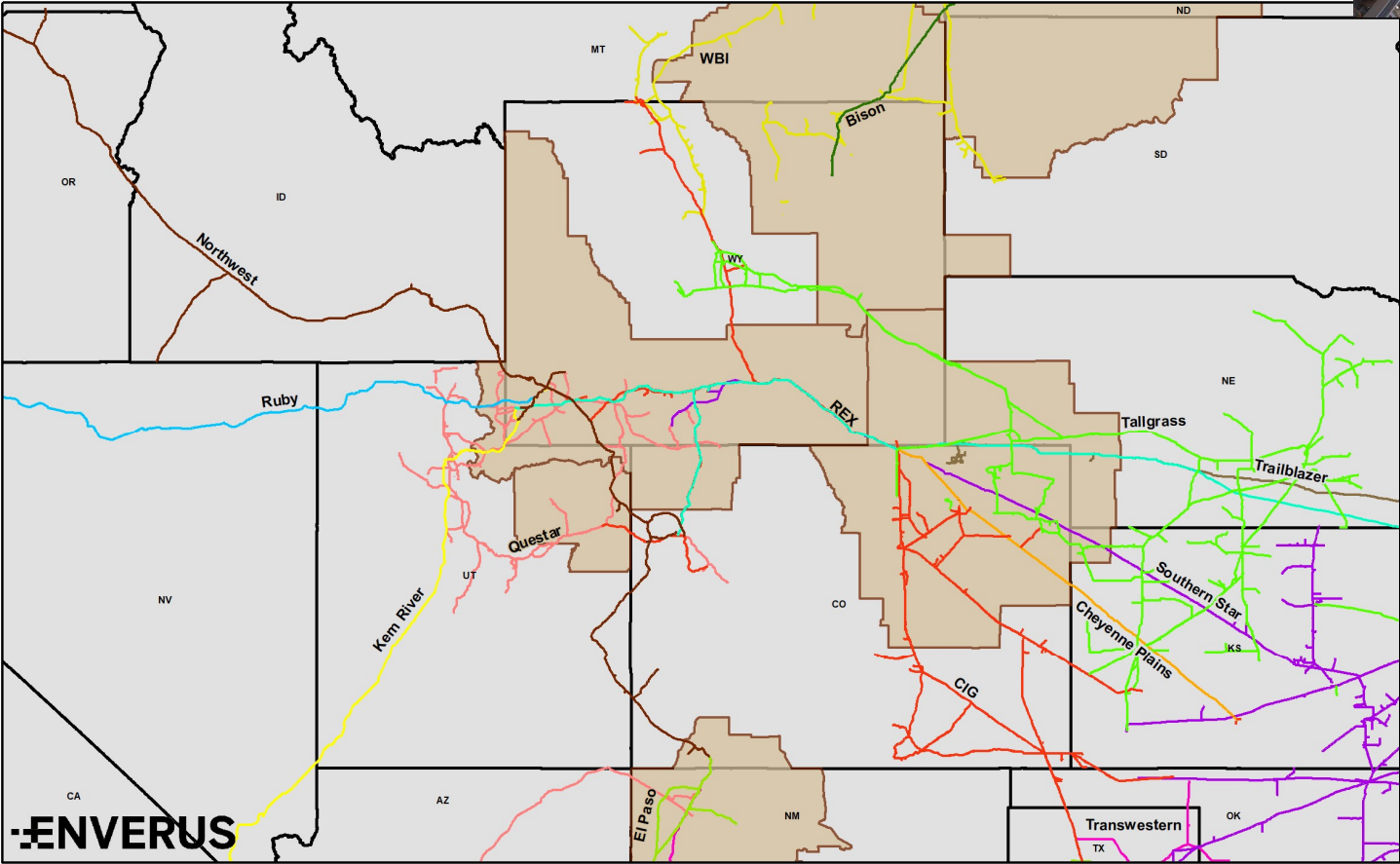
At a high level, no takeaway capacity constraints can be observed. Intra-regional constraints do exist, particularly to move gas westbound from the Piceance basin that results in Opal prices to disconnect from CIG prices.

A deeper review also shows the region is bottlenecked heading southwest, with Kern River pipeline running at full capacity almost daily. This is one of the reasons Magnum Energy is proposing to add 0.65 Bcf/d of capacity from Opal to the Arizona/California border. However, project was initially expected to come online during the winter of 2020-2021, but no other developments since the open season was held in June 2018.

Rockies: Dry Gas Production vs. Outbound Pipeline Capacity



Midstream Map: Natural Gas Pipelines



Copyright © 2020, Enverus. All rights reserved. All brand names and trademarks are the properties of their respective companies.

Production vs. Takeaway: NGL - Front Range



NGL production along the Front Range is expected to grow slightly from the end of 2019 to the end of 2024. A majority of the growth is expected to come from the DJ Basin.

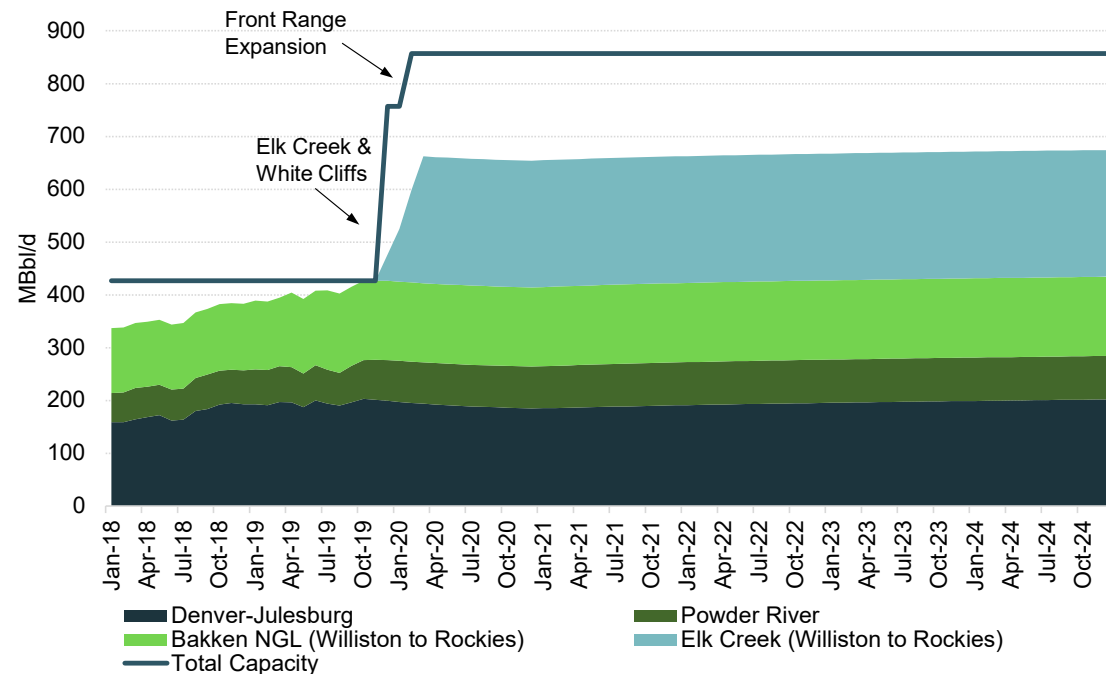
At the end of 2019, export capacity out of the Front Range was tight. New pipelines and projects in Elk Creek and White Cliffs brought much-needed export capacity to the region.

Pipeline expansions out of the Williston, mainly Elk Creek, will bring additional Y-grade supply to the Rockies.

Unlike the Bakken NGL pipeline, Elk Creek does not connect to another pipeline to take the Williston supply out of the Front Range. Rather, Elk Creek originates in the Williston and flows through the Rockies to Bushton, KS, allowing for the full 240 MBbl/d of capacity to be utilized out of the Williston or for additional volumes to be picked up in the Front Range Rockies.

The White Cliffs pipeline converted one of their lines from Crude to NGL service. This brought an additional ~90 MBbl/d of takeaway capacity to the Front Range at the end of 2019.

Rockies: NGL Supply vs. Outbound Pipeline Capacity



Notes:

- (1) Bakken to Rockies volume assumed constant at the most recent value published by the FERC for Bakken NGL and ramping up to 240 MBbl/d by 1Q2020 for Elk Creek.
- (2) Outbound pipeline capacity includes Overland Pass, DCP Wattenberg, Front Range, Elk Creek, and White Cliffs.
- (3) Production scenario assumes a basis-adjusted flat price environment of \$55/Bbl WTI and \$2.50/MMBtu Henry Hub.

Enverus Basin Reports

Enverus Basin Reports combine various products to investigate the activity and performance of key plays.

Enverus creates Basin Reports for the following play areas: Midland, Delaware, Eagle Ford, STACK, SCOOP, Williston, Powder River, Haynesville, Denver-Julesburg, and Central Basin Platform.

Each individual Basin Report includes a basin overview, operator positions and transaction analysis, type curve and economic analysis, and a geological overview.

View area economics, type curves, and activity for the Midland, Delaware, Eagle Ford, STACK, and SCOOP basins with our Basin Reports.

ENVERUS
PLS **Derrick**

[Click Here](#)
For More Information on DI Basin Reports

CONTACT

FundamentalEdge

Strategy & Analytics Group

sag@enverus.com
1-888-290-7697

Enverus

8000 S. Chester St., Suite 100
Centennial, CO 80112



Additional Publications

