

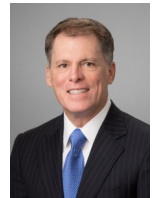
Weekly E&P Update

February 4, 2025

Vol. 5

Have We Reached “Peak Permian”?

By Steve Hendrickson
President of Ralph E. Davis Associates



The Permian Basin has been the driving force behind U.S. oil production growth for over a decade. But with current production at 6.1 million barrels per day (mmbopd) and signs of declining well productivity, the question arises: Has the Permian reached peak oil?

The Composition of Permian Production

Permian oil production comes from conventional vertical wells and unconventional horizontal wells. The 273,000 vertical wells in the region contribute about 0.4 mmbopd and have been in steady decline at a rate of 5% per year. These wells were the backbone of Permian production before the application of horizontal drilling and large hydraulic fractures to low quality formations, but they have largely exhausted their potential for growth. Without significant redevelopment efforts, their contribution will continue to shrink.

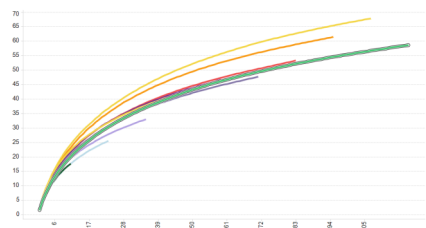
Horizontal drilling revolutionized Permian production, particularly in the Delaware and Midland Basins, which together account for 5.5 mmbopd. The Delaware Basin, covering parts of West Texas and southeastern New Mexico, contributes around 3.1 mmbopd, while the Midland Basin produces about 2.4 mmbopd. These two basins have been the primary focus of operators due to their thick, stacked pay zones and high productivity.

Other parts of the Permian, such as the Central Basin Platform and the Northwest Shelf, make up the remaining 0.2 mmbopd. While these areas historically contributed significant volumes, their potential for additional large-scale development is limited. The focus has shifted toward maximizing recovery in the core areas of the Delaware and Midland Basins, where operators continue to experiment with completion techniques and well spacing to improve recovery factors. However, as we’ve experienced in other plays, development efforts are constrained by geological limits and diminishing reservoir quality in some areas.

Two Challenges

The first obstacle to maintaining production is the high decline rate of existing wells. We estimate the existing horizontal wells in the Delaware Basin have an aggregate first-year decline of around 40%; for the existing Midland Basin producers this figure is about 45%. The aggregate PDP decline curves have a b-factor of about 1.1, so decline lessens over time. Nevertheless, operators must continuously drill new wells to offset these significant decline rates.

The second challenge is declining well productivity as the best acreage is developed first. One way to quantify this is the average cumulative barrels per foot by vintage. In the graph below, newer wells (2022-2024) in the Delaware Basin are underperforming earlier vintages by 10-20% per foot. Part of this decline is due to increased lateral lengths, as longer wells for various reasons tend to have lower recoveries per foot, but the development of lower quality areas and benches is the main factor. We observe that even wells with similar lateral lengths are generating lower recoveries over time.



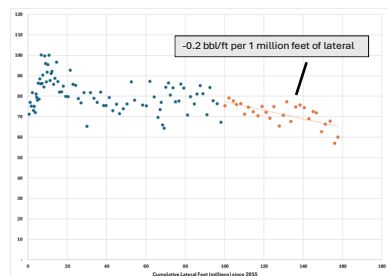
[CLICK TO ENLARGE](#)

(Source: Enverus, RED Analysis)

The Midland Basin has yet to show a decline in per-foot productivity, but its wells generally produce less per foot than those in the Delaware Basin. New wells in the Midland typically recover around 45 barrels per foot, while recent completions in the Delaware Basin are expected to ultimately recover about 65 barrels per foot.

Development Pace and the Future

The decline in per-foot productivity isn’t time-dependent, however; it’s tied to development intensity. At higher development rates, the better areas are exhausted faster. As shown below, in the Delaware Basin, after a stable development period, the estimated ultimate recovery (EUR) per foot has been declining over the last couple of years by about 0.2 barrels per foot for every million feet of lateral drilled (each point is a month of new completions).



[CLICK TO ENLARGE](#)

(Source: Enverus, RED Analysis)

Despite this, production can likely be maintained for several years—provided per-foot performance doesn’t decline further. However, history suggests continued degradation, which means more rigs will be needed. Our model, which incorporates the decline of the existing wells and diminishing returns to new drilling, indicates the Delaware Basin will require a 15% annual increase in rig count to maintain current production. At that pace, the rig count would double in five years.

The Big Picture

At some point, the Midland Basin is also likely to experience diminishing returns, requiring more rigs as well. Meanwhile, vertical wells will continue their steady decline, necessitating additional unconventional drilling just to keep production steady.

So, has the Permian reached peak oil? Not necessarily, but maintaining production will require an increasingly aggressive development pace. Growing production would be even more challenging, likely to demand significantly more rigs and possibly external capital investment. In short, while the Permian’s best days may not be behind it, the road ahead is getting steeper.

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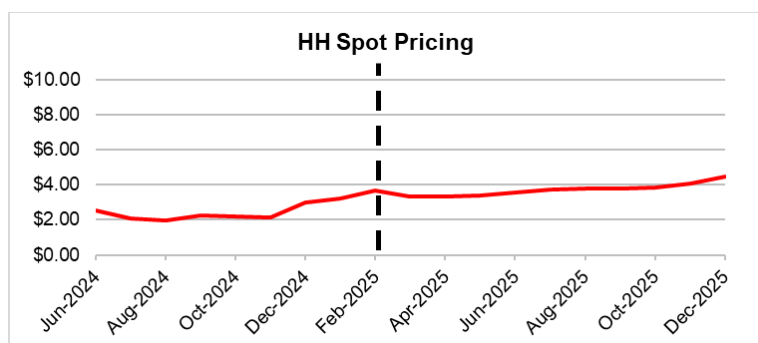
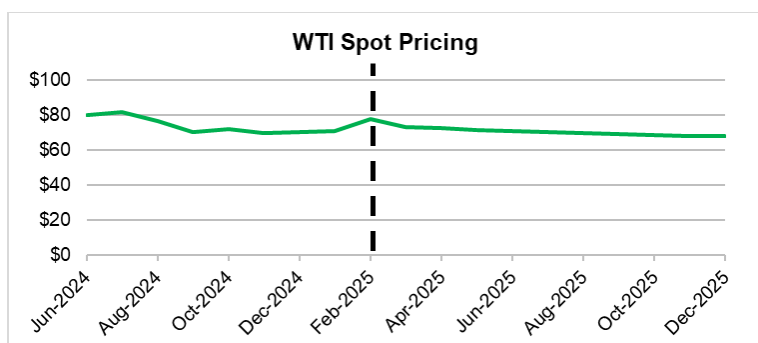
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NYMEX FUTURE PRICING



MONDAY'S MARKET CLOSE

NYMEX WTI CRUDE OIL FUTURES as of February 03, 2025 Close (\$/bbl)

Period	Current	WoW Change	Last Week	1 Yr Ago
2025	\$70.19	(\$0.40)	\$70.59	\$68.77
2026	\$66.06	(\$0.67)	\$66.73	\$65.92
2027	\$64.34	(\$0.56)	\$64.89	\$64.23
2028	\$63.45	(\$0.48)	\$63.93	\$63.44
2029	\$62.86	(\$0.45)	\$63.31	\$63.26

NYMEX HH NATURAL GAS FUTURES as of February 03, 2025 Close (\$/MMBtu)

Period	Current	WoW Change	Last Week	1 Yr Ago
2025	\$3.75	\$0.02	\$3.73	\$3.43
2026	\$3.97	(\$0.01)	\$3.98	\$3.76
2027	\$3.79	(\$0.05)	\$3.84	\$3.78
2028	\$3.65	(\$0.07)	\$3.72	\$3.76
2029	\$3.55	(\$0.03)	\$3.58	\$3.76

INDUSTRY METRICS—QUICK SNAPSHOT

	Current	Last Week	WoW Change	%Change
Crude Oil Near-Month Price (\$/bbl)	\$74.14	\$74.54	(\$0.40)	(0.5%)
Natural Gas Near-Month Price (\$/MMBtu)	\$3.23	\$3.79	(\$0.56)	(15%)
Weekly Upstream-Deal Transaction Value (\$MM)	\$5,859.74	\$0.00	\$5,859.74	-
Weekly Number of Upstream-Deal Transactions	4	1	3	300%
Current Total US Rig Count	582	576	6	1%
US Field Crude Oil Production (MMbbl/day)	13.2	13.5	(0.2)	(2%)
US Field Dry Natural Gas Production (Bcf/day)	110.4	110.2	0.2	0.2%
Commercial Crude Oil Stocks-Excluding SPR (MMbbl)	415	412	4	0.8%
Natural Gas Stocks-Working Gas Underground Storage (Bcf)	2,571	2,892	(321)	(11%)
All Basin Drilled But Uncompleted Wells (DUC-Last Quarter)	5,238	5,238	0	-

*Source—Energy Information Administration (EIA), Bloomberg LP

*Source—Baker Hughes North America Rotary Rig Count & Enverus M&A Database

COMMODITY FUTURES - MONDAY'S MARKET CLOSE

	Current	1-Month Change	3-Month Change	6-Month Change	Year Ago Change
WTI					
Prompt	\$73.16	-0.40 [-0.54%]	+1.69 [2.36%]	+0.22 [0.30%]	+0.38 [0.52%]
Bal25	\$70.19	-1.12 [-1.57%]	-1.28 [-1.79%]	-1.81 [-2.51%]	-1.98 [-2.75%]
Cal26	\$66.06	-1.69 [-2.49%]	-3.47 [-4.99%]	-3.28 [-4.73%]	-2.71 [-3.94%]
Cal27	\$64.34	-1.42 [-2.17%]	-2.63 [-3.92%]	-2.49 [-3.73%]	-1.58 [-2.40%]
Cal28	\$63.45	-1.13 [-1.74%]	-1.92 [-2.94%]	-1.69 [-2.59%]	-0.78 [-1.21%]
Cal29	\$62.86	-0.92 [-1.44%]	-1.66 [-2.58%]	-1.20 [-1.88%]	-0.58 [-0.91%]
Brent					
Prompt	\$75.96	-0.34 [-0.45%]	+0.88 [1.17%]	-0.34 [-0.45%]	-2.03 [-2.60%]
Bal25	\$73.44	-0.97 [-1.31%]	-0.18 [-0.25%]	-2.52 [-3.31%]	-3.37 [-4.39%]
Cal26	\$69.91	-1.57 [-2.19%]	-1.38 [-1.93%]	-4.08 [-5.52%]	-3.75 [-5.08%]
Cal27	\$68.41	-1.40 [-2.01%]	-1.62 [-2.31%]	-3.28 [-4.57%]	-2.89 [-4.06%]
Cal28	\$67.81	-1.16 [-1.68%]	-1.57 [-2.26%]	-2.44 [-3.48%]	-2.14 [-3.05%]
Cal29	\$67.47	-1.01 [-1.48%]	-1.57 [-2.28%]	-1.92 [-2.76%]	-1.86 [-2.68%]
Henry Hub					
Prompt	\$3.35	-0.32 [-8.71%]	+0.57 [20.53%]	+1.41 [72.61%]	+1.27 [61.00%]
Bal25	\$3.75	+0.21 [5.95%]	+0.97 [34.81%]	+1.36 [57.00%]	+1.21 [47.91%]
Cal26	\$3.97	+0.09 [2.30%]	+0.92 [30.04%]	+0.82 [25.85%]	+0.54 [15.59%]
Cal27	\$3.79	0.00 [0.09%]	+0.20 [5.48%]	+0.28 [8.06%]	+0.03 [0.82%]
Cal28	\$3.65	-0.05 [-1.27%]	-0.02 [-0.52%]	+0.08 [2.31%]	-0.13 [-3.48%]
Cal29	\$3.55	+0.03 [0.92%]	-0.09 [-2.57%]	+0.05 [1.39%]	-0.22 [-5.80%]
Heating Oil					
Prompt	\$2.46	+0.08 [4.04%]	+0.10 [4.88%]	-0.22 [-9.25%]	-0.09 [-4.14%]
Bal25	\$2.33	+0.06 [2.63%]	+0.15 [7.51%]	+0.03 [1.19%]	-0.09 [-3.82%]
Cal26	\$2.24	+0.01 [0.44%]	-0.08 [-3.72%]	-0.09 [-4.43%]	-0.06 [-2.96%]
Cal27	\$2.19	-0.01 [-0.39%]	-0.04 [-1.98%]	-0.06 [-2.75%]	-0.04 [-1.91%]
Cal28	\$2.16	-0.01 [-0.44%]	-0.03 [-1.60%]	-0.02 [-0.90%]	0.00 [-0.03%]
RBOB					
Prompt	\$2.12	+0.11 [4.58%]	+0.18 [7.84%]	+0.17 [7.16%]	-0.26 [-9.60%]
Bal25	\$2.17	+0.05 [2.15%]	+0.05 [2.11%]	+0.02 [0.70%]	-0.22 [-8.65%]
Cal26	\$1.99	+0.01 [0.62%]	-0.05 [-2.00%]	-0.07 [-2.88%]	-0.16 [-6.51%]
Cal27	\$1.96	+0.01 [0.49%]	-0.09 [-3.88%]	-0.08 [-3.63%]	-0.12 [-5.37%]
Cal28	\$1.96	+0.01 [0.42%]	-0.08 [-3.47%]	-0.06 [-2.79%]	-0.10 [-4.59%]

*Source—Bloomberg LP

SELECTED INDUSTRY HEADLINES

US Upstream M&A Hit \$105 Billion in 2024, But Momentum Slows

US upstream dealmaking is showing clear signs of slowing, according to a year-end report from Enverus Intelligence Research, which recorded \$105 billion in mergers and acquisitions for 2024.

E&Ps Pivot From the Pricey Permian

SM Energy, Ovintiv and Devon Energy were rumored to be hunting for Permian M&A—but they ultimately inked deals in cheaper basins.

Senate Confirms Fossil Fuel CEO Chris Wright as Energy Secretary

The Senate on Monday confirmed fossil fuel executive Chris Wright to serve as energy secretary, a key post to promote President Donald Trump's efforts to achieve U.S. "energy dominance" in the global market.

U.S. Frackers and Saudi Officials Tell Trump They Won't Drill More (LOGIN REQUIRED)

President says lower prices will solve many of the country's problems but finds early resistance in the oil market

US Oil Production Falls in November From Record High in October, EIA Says

U.S. crude oil production fell by 122,000 barrels per day in November to 13.314 million bpd, down from a monthly record high of 13.436 million bpd in October, the U.S. Energy Information Administration said in its Petroleum Supply Monthly report on Friday.

US Interior Department Takes First Steps to Carry Out Trump Energy Agenda

The U.S. Interior Department on Monday unveiled a suite of orders aimed at carrying out President Donald Trump's agenda to maximize domestic energy and minerals production and slash red tape.

Crude Prices Fall on US-China Trade Clash

Crude prices fell on Tuesday as U.S. tariffs on China took effect and Beijing retaliated with its own measures, heightening trade war fears, while U.S. President Trump delayed steep levies on Canada and Mexico for a month.

Natural Gas and Oil Forecast: Supply Risks vs. Weak Demand—What's Driving Prices Now?

Oil prices surged on Monday amid escalating geopolitical tensions, driven by concerns over potential supply disruptions from key crude exporters.

US Gas Production Nears Record High as E&Ps Relay Caution About Growing Too Fast

Robust seasonal demand and more favorable prices are driving a recovery in US natural gas production after January's freeze-induced slump, with output climbing to near-record levels of 106 Bcf/d over the weekend amid Appalachia and Texas volume gains, according to S&P Global Commodity Insights.

Trump's Tariffs to Have Limited Impact on Oil, Gas Prices, Goldman Sachs Says

The new tariffs imposed by U.S. President Donald Trump on imports from Canada, Mexico, and China are likely to have a limited near-term impact on global oil and gas prices, Goldman Sachs said in a note on Sunday.

Milder Forecasts Pare Natural Gas Gains as China Enacts LNG Tariffs (LOGIN REQUIRED)

Natural gas futures reversed their bullish momentum in early trading on Tuesday as weather models trended warmer overnight and China announced tariffs on U.S. LNG imports.

The Small Nuclear Reactor Revolution Is Underway

Small modular reactor technology has improved immensely in recent years, as several nuclear power companies around the globe aim to launch small-scale nuclear projects to provide clean energy within the next decade.

SELECTED RECENT TRANSACTIONS

Viper Buys \$330 Million Midland Interests in Shadow of \$4.5 Billion Dropdown

Viper Energy has entered into a definitive purchase agreement to buy mineral and royalty interests from Morita Ranches Minerals LLC in a cash-and-equity deal valued at about \$330 million.

Elk Range Acquires Permian, Eagle Ford Minerals and Royalties

Elk Range Royalties LP is acquiring Newton Financial Corp., Concord Oil Co. and Mission Oil Co., which together own mineral and royalty interests across the Permian Basin and Eagle Ford Shale, Dallas-based Elk said Jan. 29.

Diversified to Acquire Maverick, Enter Permian Basin in \$1.3 Billion Deal

Diversified Energy will acquire EIG's Maverick Natural Resources, adding acreage that offsets Diversified's core Western Anadarko position and Permian Basin assets in the northern Delaware.

Amplify Energy to Merge With Juniper Capital's Upstream Rocky Mountain Companies

Amplify Energy has entered into a definitive merger agreement with privately held Juniper Capital to combine with certain Juniper portfolio companies which own substantial oil-weighted producing assets and significant leasehold interests in the DJ and Powder River Basins.

W&T Offshore Secures Settlement and Strategic Asset Sale

The company is making strategic moves by selling a non-core interest in Garden Banks Blocks 385 and 386 for \$12.3 million.

Kimbell Royalty Partners Acquires Midland Basin Assets for \$231 Million

Kimbell Royalty Partners, LP an owner of oil and gas mineral and royalty interests in approximately 17 million gross acres in 28 states, today announced that it has agreed to acquire mineral and royalty interests held by a private seller in a cash and unit transaction valued at approximately \$231 million.

Diversified Energy Company to Acquire Operated Properties of Summit Natural Resources LLC for \$45 Million

Diversified Energy Company PLC agreed to acquire operated natural gas properties and related facilities of Summit Natural Resources LLC for \$45 million on January 6, 2025.

Vitesse Inks a \$222 Million Strategic Expansion Deal to Acquire Lucero Energy

Vitesse Energy, Inc. VTS recently announced an all-stock transaction deal to acquire Lucero Energy, an oil and gas producer operating on the North Dakota side of the Williston Basin.

China's CNOOC Sells US Assets to Britain's INEOS

China's CNOOC Ltd has sold its U.S. subsidiary, together with its upstream oil and gas assets in the Gulf of Mexico, to British chemicals group INEOS, according to a CNOOC statement issued on Saturday.

Vitesse Energy to Acquire Lucero Energy

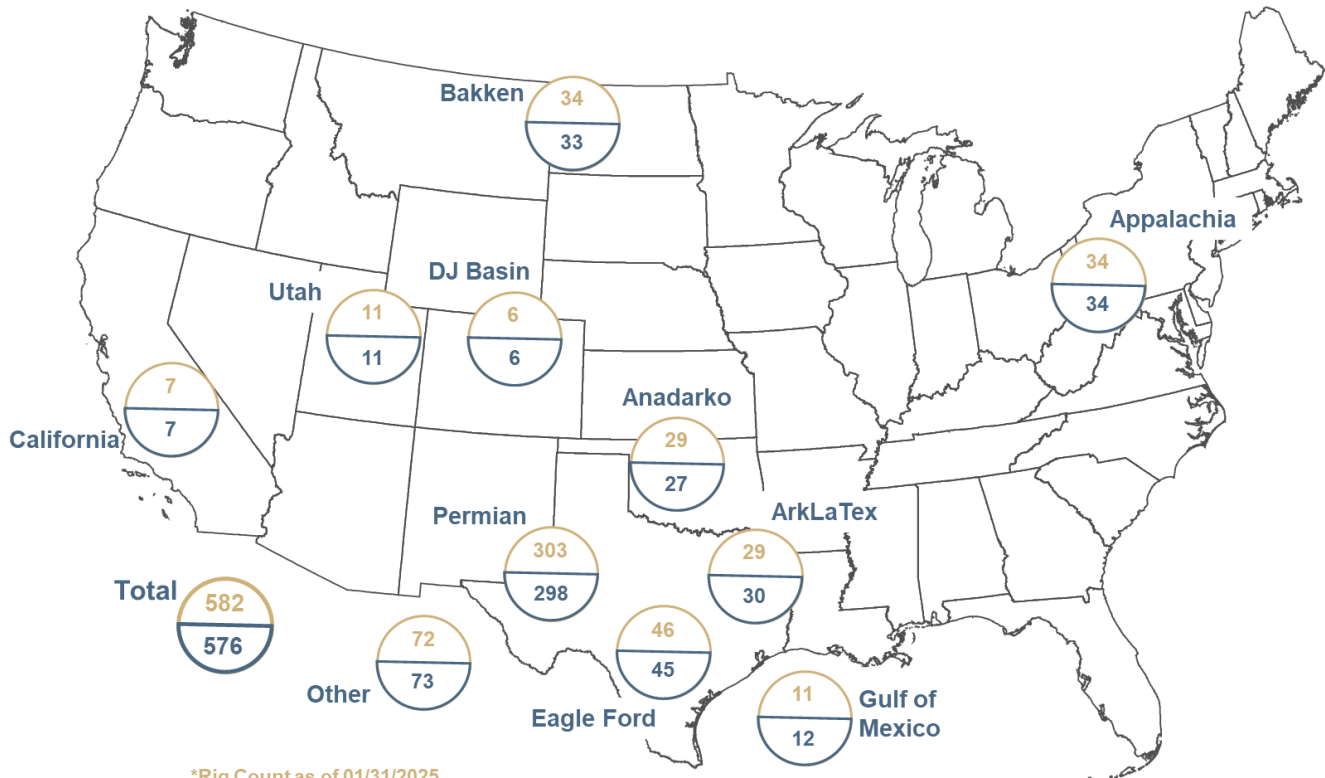
Vitesse Energy is set to acquire Lucero Energy in an all-stock transaction valued at \$222 million, enhancing Vitesse's financial standing and operational scope.

Freehold Royalties Announces Strategic Midland Basin Royalty Acquisition and Bought Deal Equity Financing

Freehold Royalties Ltd. has entered into a definitive agreement with a private seller to acquire mineral title and royalty interests in the core of the Midland Basin in Texas for approximately \$216 million.

CNX to Acquire Appalachian Basin Natural Gas Business From Apex Energy

RIG ACTIVITY BY US REGION

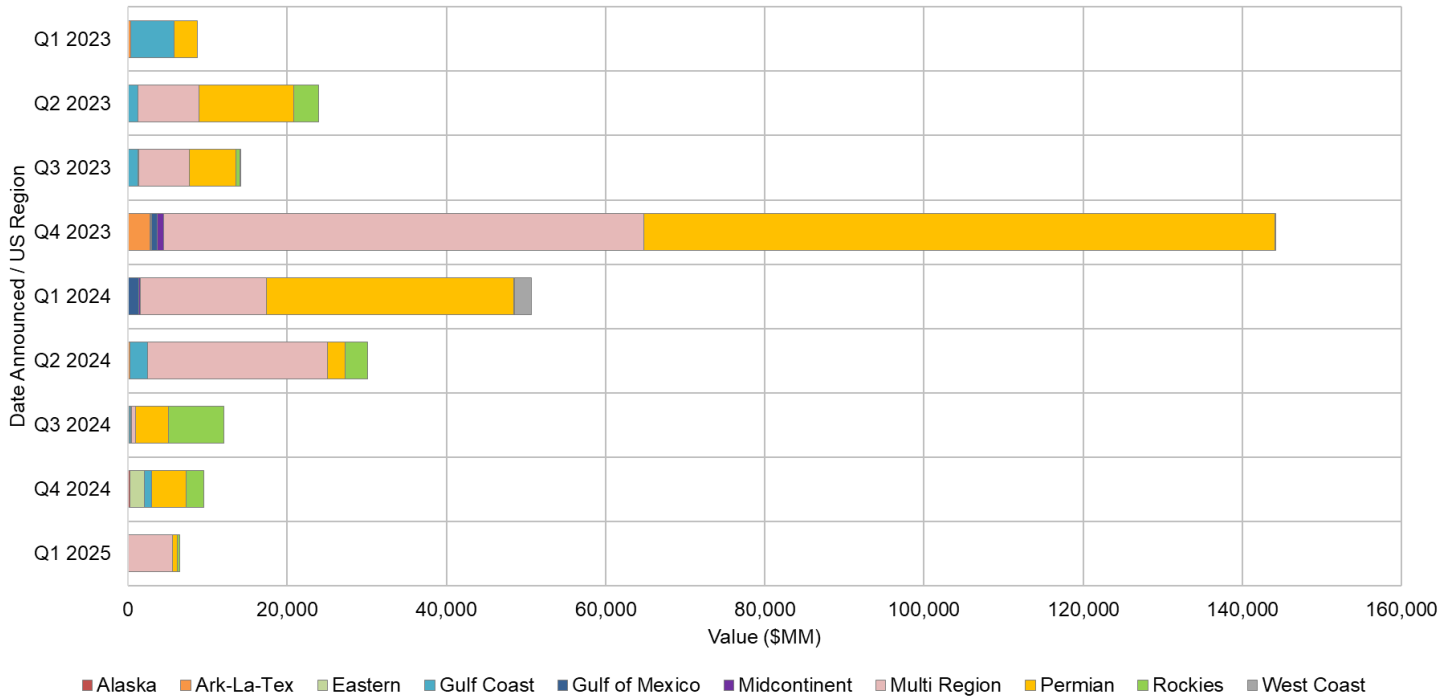


*Rig Count as of 01/31/2025
*Rig Count as of 01/24/2025

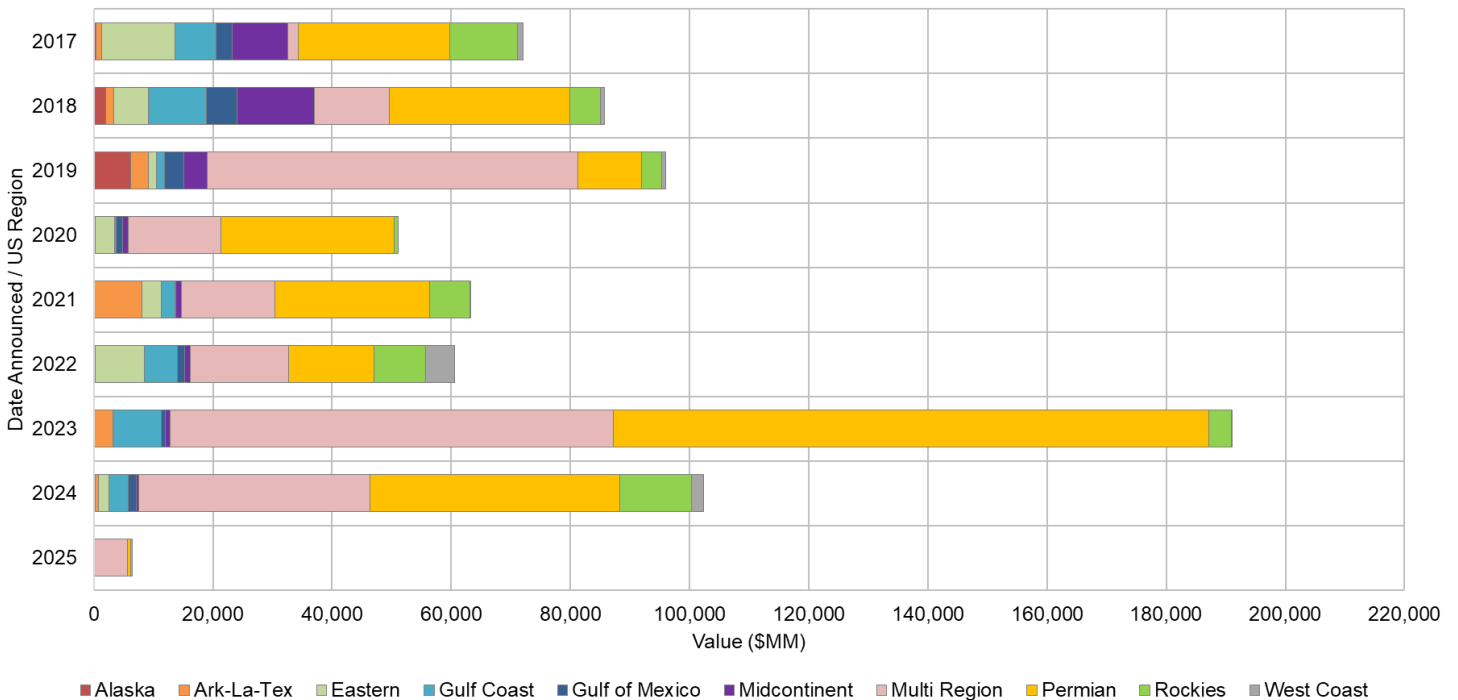
	Week Ending 01/31/2025			Week Ending 01/24/2025		Week Ending 02/02/2024
U.S. Rig Breakouts	Count	+/-	Count	+/-	Count	
Oil	479	7	472	(20)	499	
Gas	98	(1)	99	(19)	117	
Not Specified	5	0	5	2	3	
Directional	50	(1)	51	1	49	
Horizontal	519	8	511	(39)	558	
Vertical	13	(1)	14	1	12	
Land (Inc Others)	567	7	560	(33)	600	
Inland Waters	2	0	2	2	0	
Offshore	13	(1)	14	(6)	19	
US Total	582	6	576	(37)	619	

*Source—Baker Hughes North America Rotary Rig Count

DEAL VALUE BY US REGION (BY QUARTER)

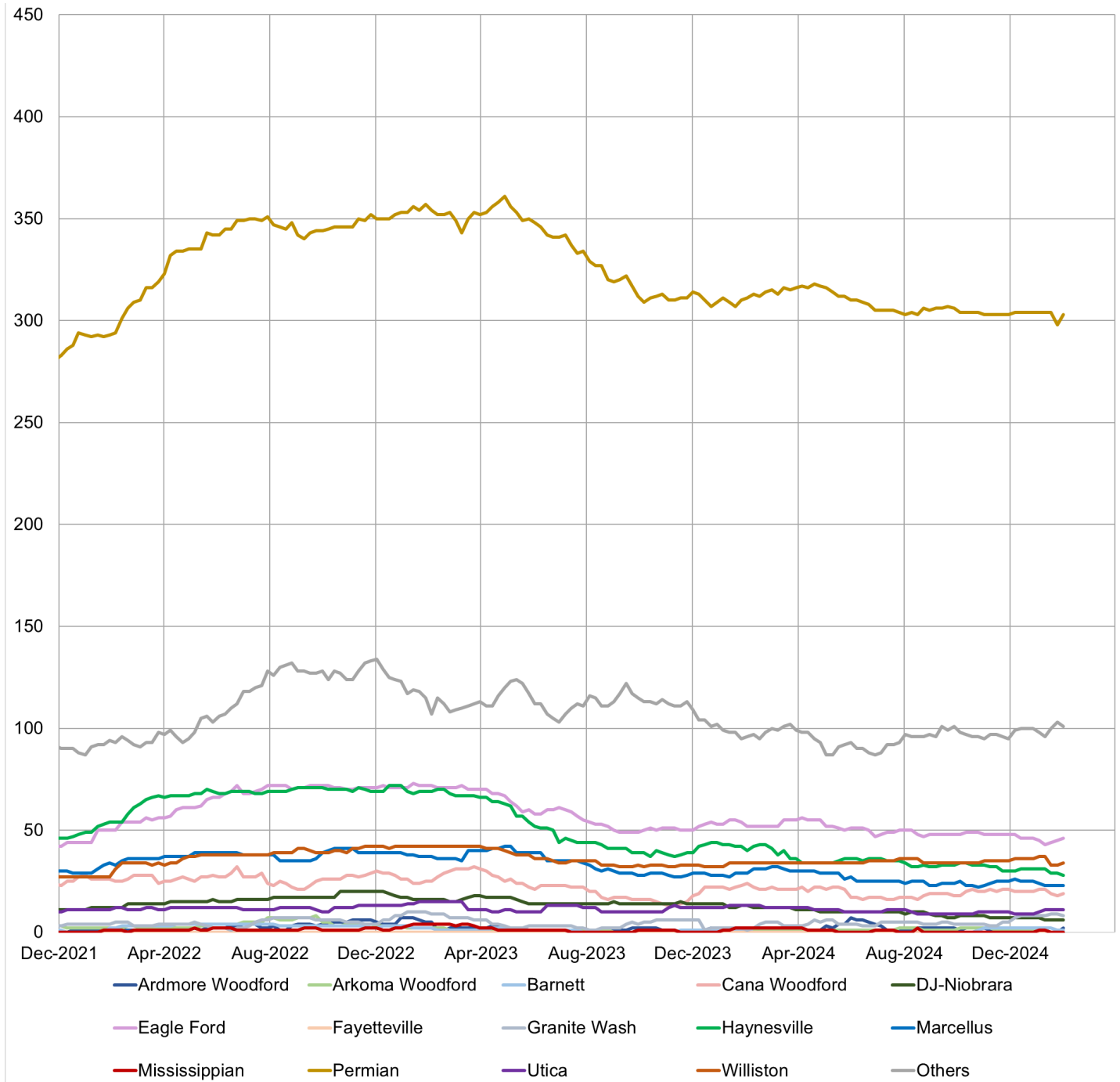


DEAL VALUE BY US REGION (BY YEAR)



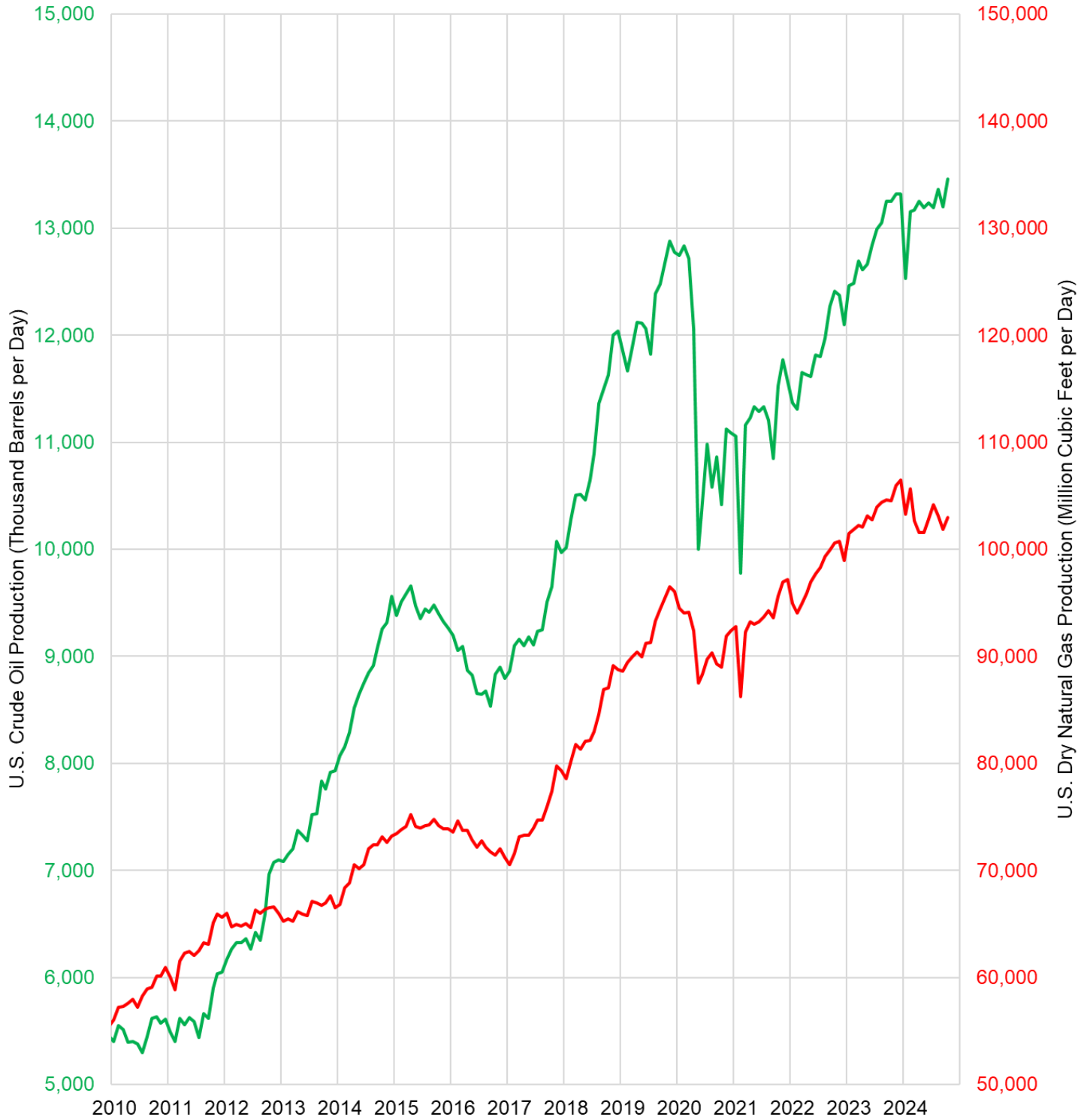
*Source—Enverus M&A Data- (Charts exclude terminated deals)

RIG ACTIVITY BY US REGION



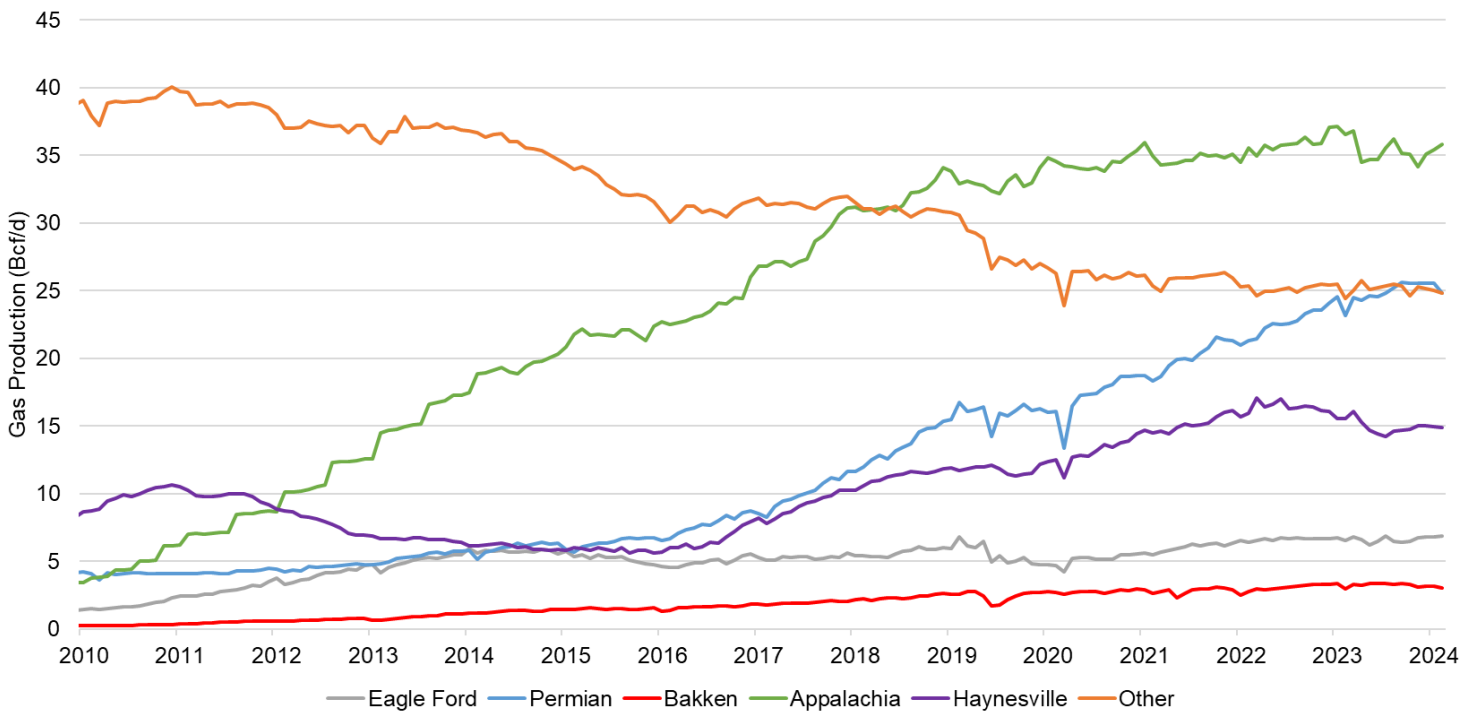
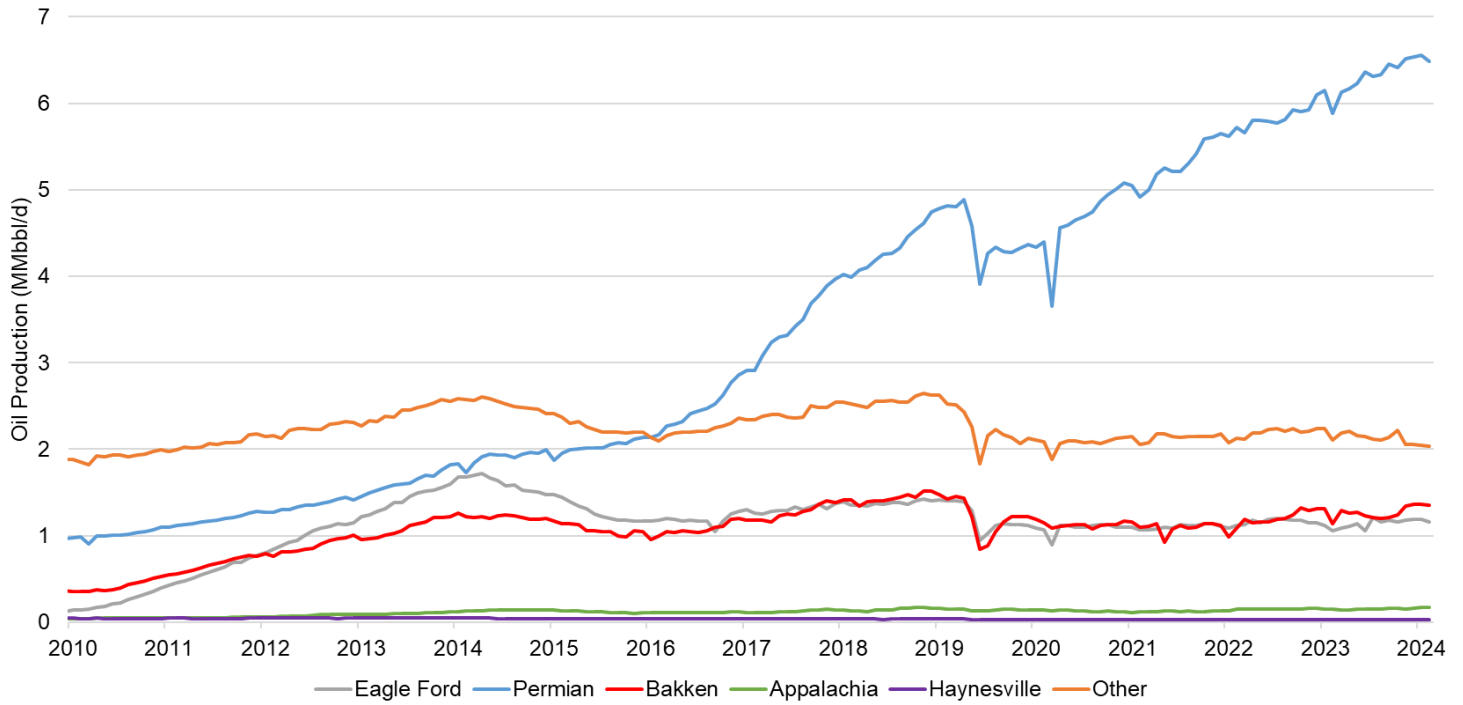
*Source—Baker Hughes North America Rotary Rig Count

US DAILY CRUDE (MMbbl) & DRY NATURAL GAS PRODUCTION (MMcf)



*Source—Energy Information Administration (EIA)

HISTORICAL PRODUCTION OF SELECTED US SHALE REGIONS



*Source—Energy Information Administration (EIA)



UPCOMING EVENTS

February 2025

<u>SPE Hydraulic Fracturing Technology Conference</u>	February 4-6	The Woodlands, TX
<u>NAPE Summit</u>	February 5-7	Houston, TX
<u>KIPP Better Together Breakfast</u>	February 11	Tulsa, OK
<u>SPE GCS - A&D Symposium</u>	February 26	Houston, TX

March 2025

<u>U.S. Men's Clay Court Championship</u>	March 29 - April 6	Houston, TX
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April 2025

<u>Texas Bankruptcy Bench/Bar Conference</u>	April 2	Houston, TX
<u>Quorum Qnections 25</u>	April 22-24	Las Vegas, NV
<u>World Oilman's Poker Tournament</u>	April 23-25	Las Vegas, NV
<u>Hunger Free Golf Classic</u>	April 25	Houston, TX

*Denotes an Opportune Sponsored Event

ABOUT RALPH E. DAVIS ASSOCIATES

Ralph E. Davis Associates LLC (RED) is an industry-leading petroleum engineering and geosciences firm committed to satisfying the individual needs of clients. We accomplish this by holding ourselves to the highest standards of integrity and professionalism to deliver honest, direct and actionable insights to help clients achieve their strategic objectives. We distinguish ourselves by combining reservoir engineering, geoscience evaluation techniques and advanced data analytics with economic analyses to provide our clients with individual, customized solutions.

Banks, bondholders, private equity firms, financial institutions and law firms around the world trust in RED's diverse services and unrivaled upstream oil and gas expertise to deliver comprehensive solutions that help clients make informed decisions. We add value to every engagement by employing a team approach, leveraging Opportune LLP's experienced bench of experts in transactional due diligence, tax advisory, investment banking, restructuring and valuation.

We offer technical and economic analyses to deliver our clients a complete, independent, accurate and detailed assessment of the value of their assets. We apply a robust set of technical capabilities to assist our clients. Our capabilities include:

- Reservoir engineering and geosciences
- Economic forecasting and reporting
- Data analytics and geospatial analysis

KEY CONTACTS



Steve Hendrickson is the President of Ralph E. Davis Associates, an Opportune LLP company. Steve has over 35 years of professional leadership experience in the energy industry with a proven track record of adding value through acquisitions, development and operations. Steve is a licensed professional engineer in the state of Texas, and holds an M.S. in Finance from the University of Houston and a B.S. in Chemical Engineering from The University of Texas at Austin. He recently served as a board member of the Society of Petroleum Evaluation Engineers (SPEE) and is a registered FINRA representative.



John Beaird is Vice President of Ralph E. Davis Associates, an Opportune LLP company. John has 39 years of oil and gas management, reservoir engineering, and petroleum economics evaluation experience. Recent relevant experience includes the Permian, Western Gulf, Tx-La-Miss Salt, Mid-Continent, Denver-Julesburg, Wind River, Williston Basin, and Appalachian Basins. John is a registered Petroleum Engineer in the State of Texas and holds a B.S. in Petroleum Engineering from Louisiana Tech University. He is also an active member of the Society of Petroleum Evaluation Engineers (SPEE).



David Edwards is a Petroleum Engineer at Ralph E. Davis Associates, an Opportune LLP company. David has over four years of reserves engineering experience in conventional and unconventional reservoirs. Before RED, David was a Petroleum Engineer at a lower middle market A&D advisory firm where he handled the technical processes for marketed assets. He began his career with an operator in Dallas, where he contributed to its engineering, operations, and A&D teams. David holds an M.B.A. from The University of Texas Permian Basin and a B.S. in Petroleum Engineering from The University of Oklahoma.

