



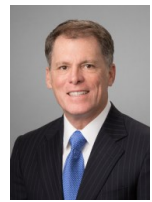
# Weekly E&P Update

February 7, 2023

Vol. 5

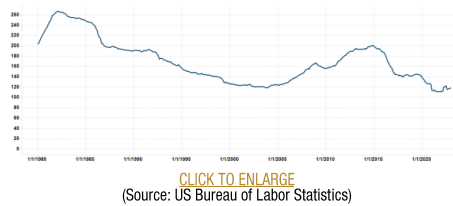
## ICYMI - Oil And Gas Extraction Labor Productivity At An All-time High

By Steve Hendrickson  
President of Ralph E. Davis Associates

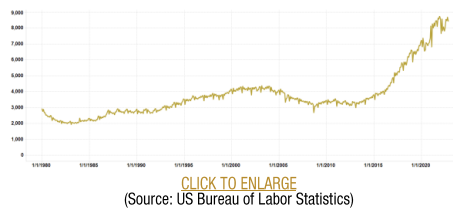


I read a [recent article](#) about the stagnation of labor productivity in the US construction industry. Actually, stagnation is a bit generous since the [report that the article is based on](#) shows that labor productivity in the construction sector peaked in 1967 and has been falling ever since.

This caused me to wonder about labor productivity in the oil and gas industry, particularly extraction. I expected that I would find a gradual increase, mainly as a result of continual improvements in computing power and software development. Still, I was surprised to see how dramatically it's increased since the shale revolution took off.



For context, the graph on the left shows the average number of people employed in oil and gas extraction each month since 1980. The data is from the US Bureau of Labor Statistics as reported on the Federal Reserve Economic Data (FRED) website. This group includes field operations personnel, engineers and geologists who "operate and/or develop oil and gas field properties" (code CES1021100001): oilfield services are not included.



To estimate labor productivity, I considered a couple of metrics and settled on barrels equivalent per month per employee. Barrels equivalent reflects combined oil and gas production (total withdrawals) on a 6:1 ratio: data are from the US Energy Information Agency website.

So what happened? As expected, the productivity of this group gradually increased starting in the early 1980s, about the same time desktop computing and increased automation of field measurement took off. This increase coincided with the beginning of twenty years of flat production (on an equivalent basis) and low prices that forced companies to reduce headcount. Then in the early 2000s, productivity declined as companies staffed up due to higher prices and a recognition that unconventional reservoirs held enormous potential. It took a while for production growth to accelerate, but when it did, productivity surged ahead.

Now we find ourselves in an almost unimaginable situation where the number of people in this subset is very low, yet at the same time, US oil production is higher than in previous decades and gas production is at a record level. And while this success story reflects a combination of continued improvements in how work gets done and the high productivity of unconventional wells, it also raises questions about whether the industry can sustain its growth without increasing the number of these types of workers.

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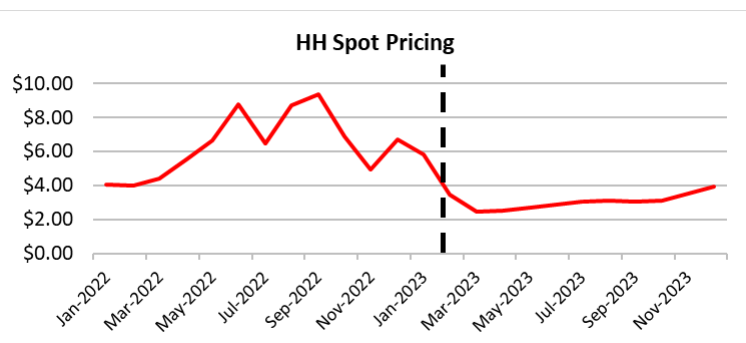
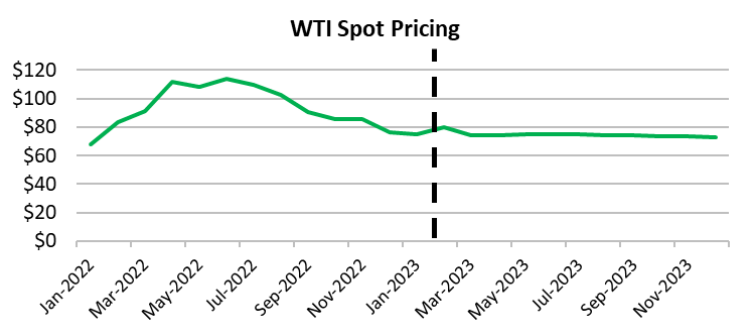
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## NYMEX FUTURE PRICING



## MONDAY'S MARKET CLOSE

### **NYMEX WTI CRUDE OIL FUTURES as of February 6, 2023 Close (\$/bbl)**

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$74.14	(\$3.26)	\$77.40	\$76.87
2024	\$70.74	(\$2.01)	\$72.75	\$71.70
2025	\$67.18	(\$1.37)	\$68.55	\$68.53
2026	\$64.11	(\$0.99)	\$65.10	\$66.40
2027	\$61.39	(\$0.73)	\$62.12	\$65.27

### **NYMEX HH NATURAL GAS FUTURES as of February 6, 2023 Close (\$/MMBtu)**

Period	Current	WoW Change	Last Week	1 Yr Ago
2023	\$3.04	(\$0.14)	\$3.18	\$3.68
2024	\$3.61	(\$0.20)	\$3.81	\$3.34
2025	\$3.86	(\$0.22)	\$4.08	\$3.18
2026	\$3.96	(\$0.17)	\$4.13	\$3.13
2027	\$3.99	(\$0.21)	\$4.20	\$3.15

## INDUSTRY METRICS—QUICK SNAPSHOT

	<b>Current</b>	<b>Last Week</b>	<b>WoW Change</b>	<b>%Change</b>
Crude Oil Near-Month Price (\$/bbl)	\$75.92	\$80.48	(\$4.56)	(6%)
Natural Gas Near-Month Price (\$/MMBtu)	\$2.46	\$3.00	(\$0.55)	(18%)
Weekly Upstream-Deal Transaction Value (\$MM)	\$0.00	\$1,602.00	(\$1,602.00)	(100%)
Weekly Number of Upstream-Deal Transactions	2	3	(1)	(33%)
Current Total US Rig Count	759	771	(12)	(2%)
US Field Crude Oil Production (MMbbl/day)	12.2	12.2	-	0%
US Field Dry Natural Gas Production (Bcf/day)	104.1	105.4	(1.3)	(1%)
Commercial Crude Oil Stocks-Excluding SPR (MMbbl)	453	449	4.1	0.9%
Natural Gas Stocks-Working Gas Underground Storage (Bcf)	2,583	2,729	(146)	(5%)
Total Drilled But Uncompleted Wells (DUC-Last Month)	4,577	4,577	-	0%

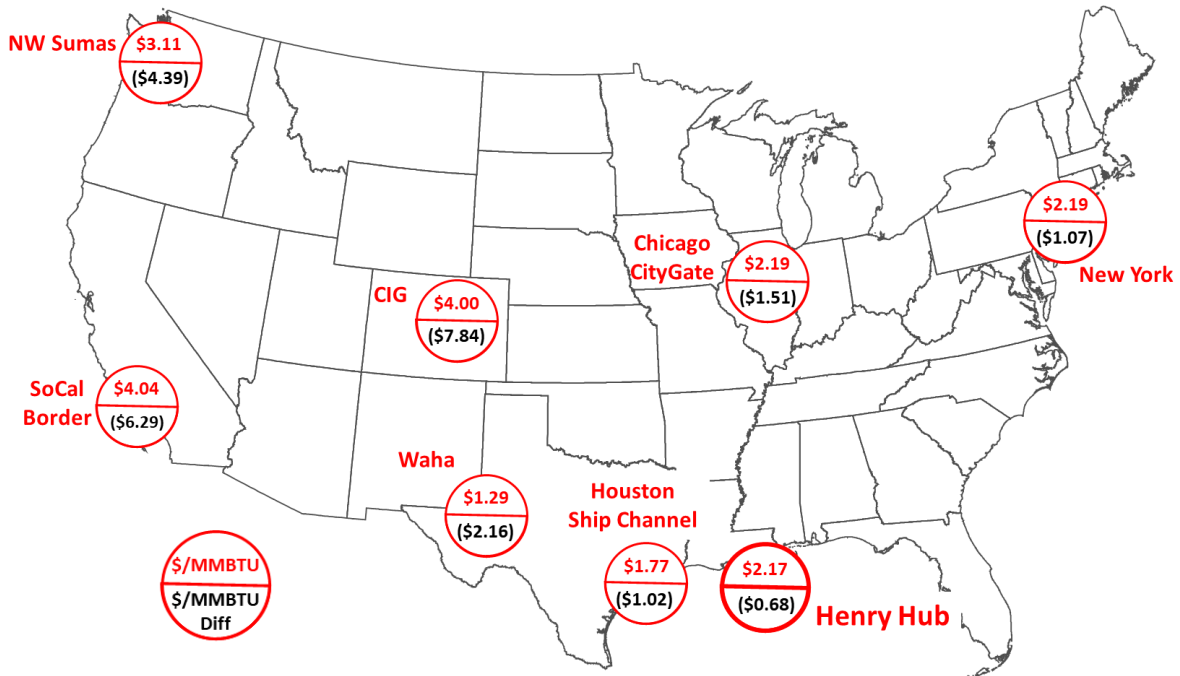
\*Source—Energy Information Administration, United States (EIA)

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

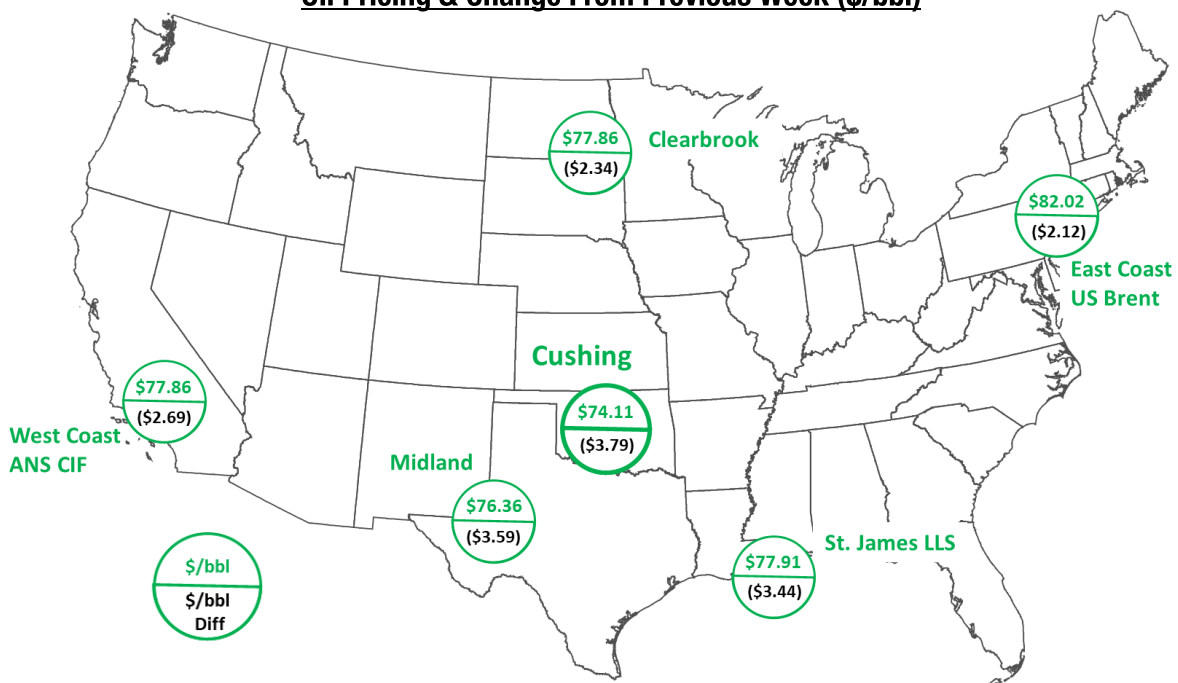


**US COMMODITY PRICES CONTINUED**

**Natural Gas Pricing & Change From Previous Week (\$/MMBTu)**



**Oil Pricing & Change From Previous Week (\$/bbl)**



\*Source—Bloomberg LP



## **SELECTED INDUSTRY HEADLINES**

### **Energy Workforce & Technology Council: Oilfield Services Employment Highest Since March 2020**

Employment in the U.S. oilfield services and equipment sector rose by an estimated 3,069 jobs to 652,090 in January, according to preliminary data from the Bureau of Labor Statistics after adjustments and analysis by the Energy Workforce & Technology Council.

### **Turkey's Ceyhan Oil Port Disrupted By Weather As Earthquake Damage Assessed**

Adverse weather conditions are disrupting loadings at Turkey's Ceyhan port, where damage is being assessed in wake of the recent twin earthquakes.

### **Saudi Arabia Unexpectedly Raises Oil Prices For Next Month**

Saudi Arabia unexpectedly raised oil prices for its main market of Asia, while also lifting those for US and European customers.

### **Texas Railroad Commission: Texas Natural Gas Supply Chain "Held Strong" During Winter Storm**

For the second time this winter, the state's natural gas supply chain was tested and performed as needed to keep heating and lights on for millions and millions of Texans.

### **German Jan-Nov Oil Imports Up 9.4%, Bill Up 77.4% (LOGIN CREDENTIALS REQUIRED)**

German crude oil import volumes rose 9.4% in the first 11 months of 2022 on a year-on-year basis as the economy recovered from the COVID-19 pandemic, while the bill rose sharply due to higher prices, recent official data showed.

### **EU Playing Catch-Up To Secure Sustainable Energy**

Even though the EU lead the energy transition, it is now in the position of catch-up to secure sustainable energy to its citizens.

### **New Western Measures Aim To Turn Up The Heat On Putin's Oil Revenues. Analysts Are Underwhelmed**

The Group of Seven wealthy countries, the European Union and Australia recently agreed to limit the price of Russian diesel and other refined petroleum products.

### **Will OPEC Abandon Its Output Cuts Amid Soaring Chinese Demand**

A strong rebound in China's oil demand this year may lead to the OPEC+ group reconsidering its production targets and quotas.

### **What Would War-End Mean For Global Oil And Gas?**

The end of the war in Ukraine would reduce pressure on Western governments to continue expanding sanctions on Russia's oil and gas sector.

### **India Will Buy Oil From 'Wherever We Have To' If Terms Are Beneficial, Energy Minister Says**

India is the third largest oil consumer in the world, and according to Hardeep Singh Puri, accounts for 30% of global consumption.

### **Why The White House Is Wrong About Oil Major Share Buybacks**

The Biden Administration has accused oil majors of buying back shares instead of boosting production, but oil majors have been doing both.

### **Oil Rises 1% In Choppy Trade On China Demand Hopes**

Oil prices edged higher in choppy trading on Monday, buoyed by prospects for China's recovery after the relaxation of COVID-19 restrictions.

### **Analysts Predict 42% Decline In Russian Oil Production By 2035**

Russia's oil output could decrease from 12 million barrels per day in 2019 to 7-9 million bpd in 2035, according to recent reports.

### **How Are The Leading Countries Faring On The Path To Net Zero? (LOGIN CREDENTIALS REQUIRED)**

Most Organisation for Economic Co-operation and Development (OECD) nations aim to reach net zero by 2050, while developing countries plan to get there a decade or two later.

### **Europe Bans Russian Diesel And Other Oil Products**

The EU is now barring imports of Russian diesel and other products from Russian refineries used throughout Europe.

### **Venezuela Is Scrambling To Make The Most Of The Global Oil Shortage**

Despite easing sanctions and some additional funds flowing into Venezuela's oil industry, the country is struggling to get it's production to where it needs to be.





## **SELECTED RECENT TRANSACTIONS**

### **Alliance Resource Partners, L.P. Announces \$72.3 Million Mineral Acquisition**

Alliance Resource Partners, L.P. recently announced a \$72.3 million acquisition of oil & gas mineral interests in the Permian Basin from JC Resources LP.

### **INPEX Sells Eagle Ford Tight Oil Production And Development Assets To Repsol**

Japan's INPEX Corporation has sold its Eagle Ford assets to Repsol Oil & Gas USA, a subsidiary of Spanish energy company Repsol.

### **Elk Range Royalties Announces Acquisition in the Permian Basin and Launch of Elk Range Royalties II**

Elk Range Royalties, LP recently announced it has closed an acquisition of Permian Basin mineral and royalty interests pursuant to a purchase and sale agreement with Tower Rock Oil & Gas and its affiliates.

### **Arena Energy Acquires Gulf of Mexico Shelf Properties from Cox Operating, LLC**

Arena Energy, LLC recently announced it has closed on the acquisition of Cox Operating, LLC's interest in two fields located in the shallow waters of the Gulf of Mexico.

### **Matador Resources Company Announces Strategic Bolt-on Delaware Basin Acquisition**

Matador Resources Company recently announced that a wholly-owned subsidiary of Matador has entered into a definitive agreement to acquire Advance Energy Partners Holdings, LLC.

### **Black Mountain Energy Secures Earthstone Energy Oil And Gas Field, New Mexico**

Black Mountain Energy has recently agreed to acquire 100 per cent of NYSE-listed Earthstone Energy's interest in an existing oil and gas field in the Permian Basin in New Mexico.

### **Vitol's VTX To Acquire Delaware Basin Resources**

Vitol Inc.'s US upstream company, VTX Energy Partners LLC, has agreed to acquire Delaware Basin Resources, Midland, Tex., and associated surface and water businesses. A purchase price was not disclosed.

### **WildFire Energy Announces Eagle Ford Acquisition From Chesapeake Energy Corporation**

WildFire Energy recently announced the acquisition of approximately 377,000 net acres and approximately 1,350 wells in the Brazos Valley region of its Eagle Ford asset from Chesapeake Energy Corporation.

### **Whitehawk Energy Announces Agreement To Acquire Core Haynesville Shale Natural Gas Mineral And Royalty Assets For Up To \$105 Million**

Whitehawk Energy, LLC recently announced a definitive agreement to acquire up to \$105 million of natural gas mineral and royalty assets primarily located in northwestern Louisiana.

### **Permian Resources Announces Portfolio Optimization Transactions**

Permian Resources Corporation recently announced that it has entered into a series of portfolio management transactions, comprising of a bolt-on acquisition, a divestiture of non-operated production and acreage and a divestiture of a portion of its water infrastructure assets in Reeves County, Texas.

### **HNCR Sponsored SPAC Files For \$120 Million Business Combination**

Houston Natural Resources Corp. (HNRC) announced that its subsidiary Houston Natural Resources, Inc, through its majority owned HNRAC Sponsors, LLC, sponsored a Special Purpose Acquisition Corp (SPAC), HNR Acquisition Corp (HNRA), and entered into a membership purchase agreement with Pogo Resources and two affiliates (Pogo) for a purchase price of \$120 million dollars.

### **Arena Energy Announces Strategic Acquisition of Gulf of Mexico Shelf Properties from GOM Shelf, LLC**

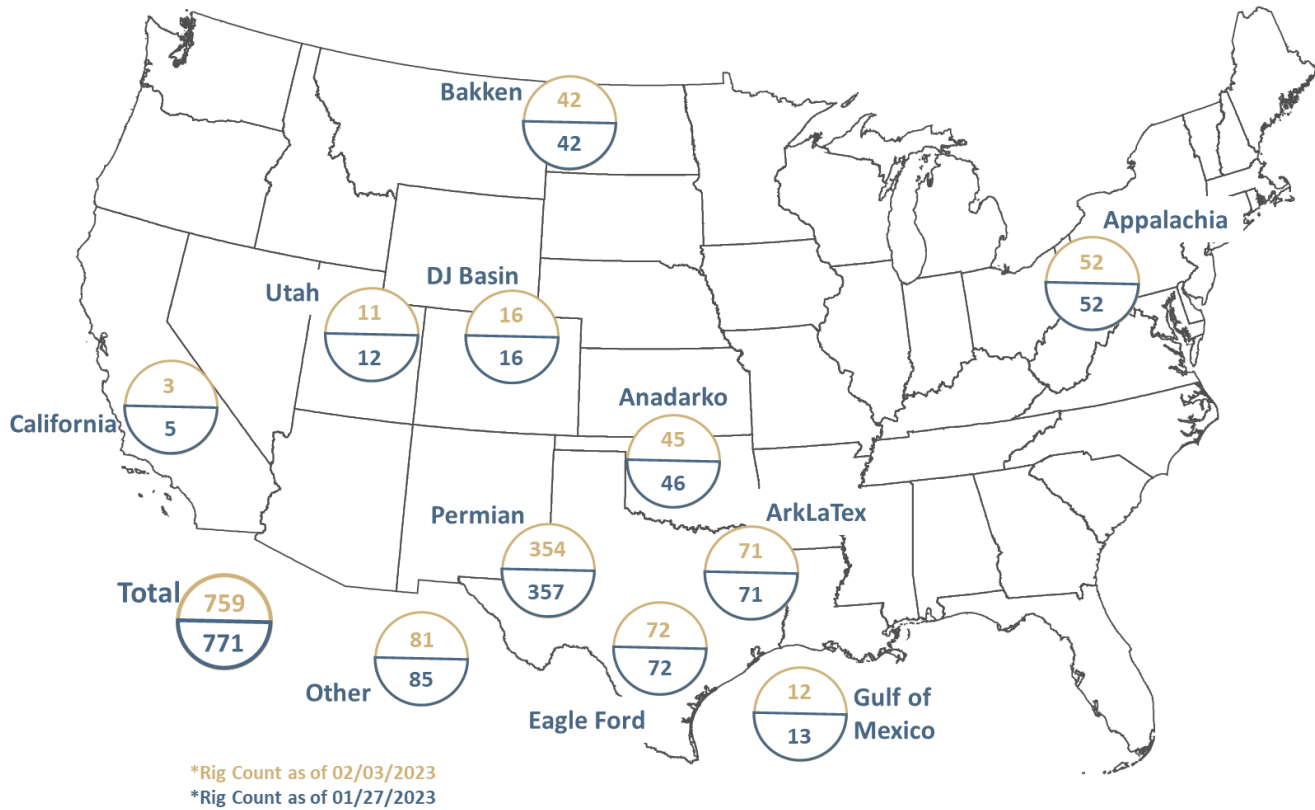
Arena Energy, LLC ("Arena"), a leading independent oil and gas exploration company focused on the Gulf of Mexico Shelf, recently announced it has closed on the acquisition of seven blocks and twelve platforms in the Gulf of Mexico from GOM Shelf, LLC.

### **PHX Minerals Reports Fiscal 2022 Results and Haynesville, SCOOP Acquisitions**

PHX Minerals Inc. recently announced that it acquired 923 net royalty acres in the SCOOP and Haynesville plays for approximately \$13.5 million in its fiscal fourth quarter of 2022.



## RIG ACTIVITY BY US REGION

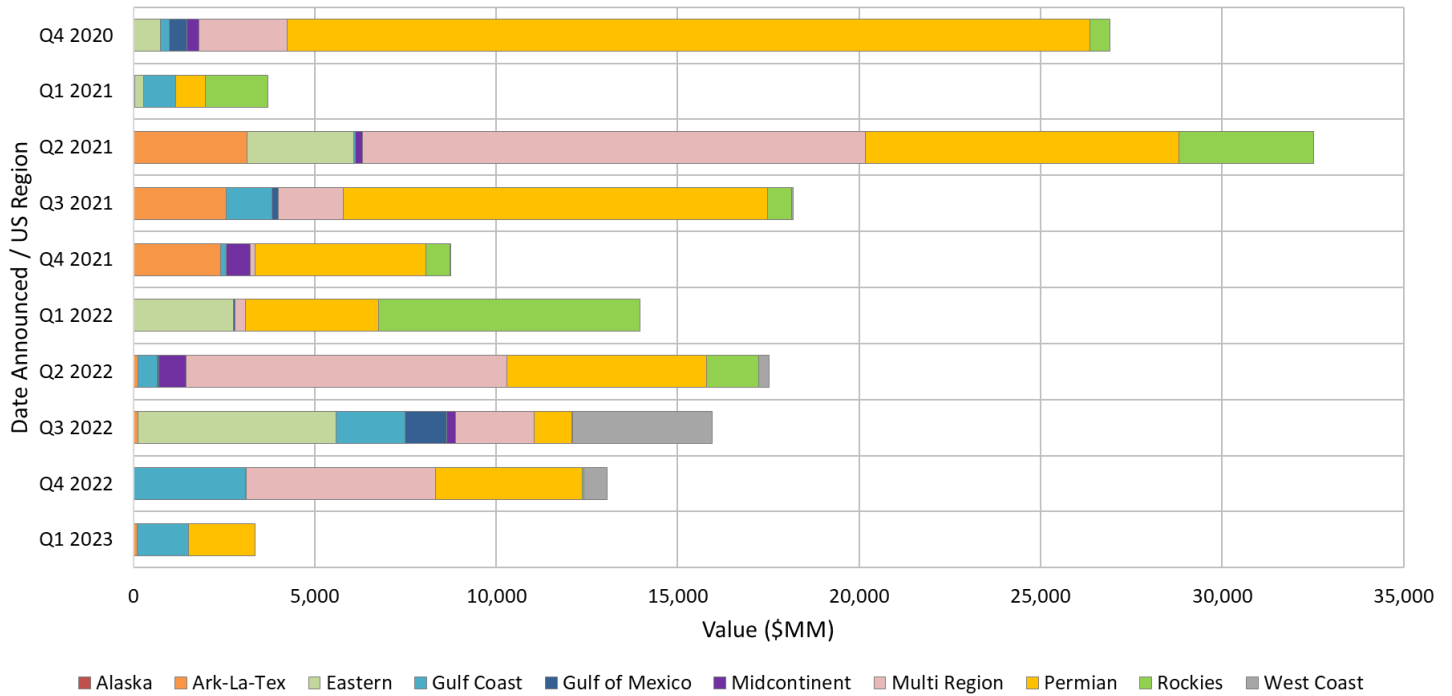


	Week Ending 02/03/2023		Week Ending 01/27/2023		Week Ending 02/04/2022
U.S. Rig Breakouts	Count	+/-	Count	+/-	Count
Oil	599	(10)	609	102	497
Gas	158	(2)	160	45	116
Not Specified	2	0	2	2	0
Directional	38	(7)	45	4	34
Horizontal	700	(5)	705	145	555
Vertical	21	0	21	(3)	24
Land (Inc Others)	745	(11)	756	150	595
Inland Waters	2	0	2	0	2
Offshore	12	(1)	13	(4)	16
<b>US Total</b>	<b>759</b>	<b>(12)</b>	<b>771</b>	<b>146</b>	<b>613</b>

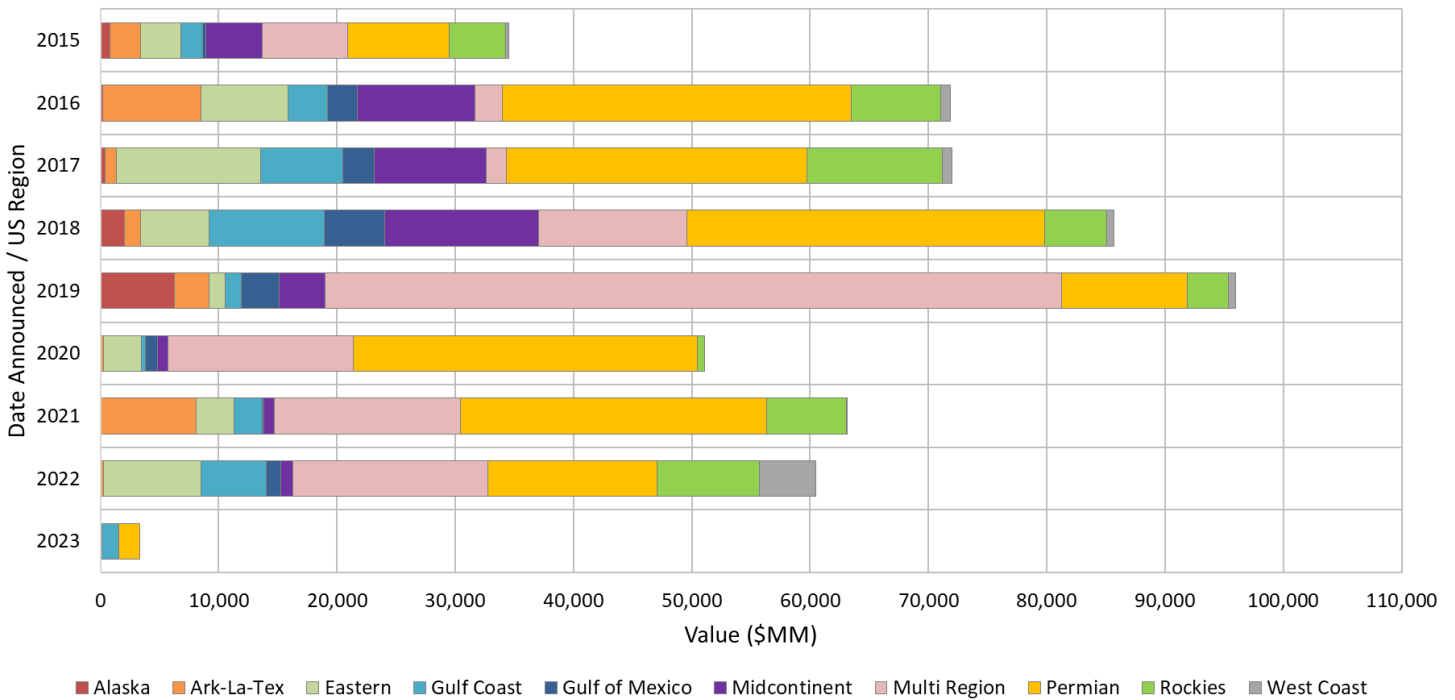
\*Source—Baker Hughes Weekly Rig Counts



## DEAL VALUE BY US REGION (BY QUARTER)



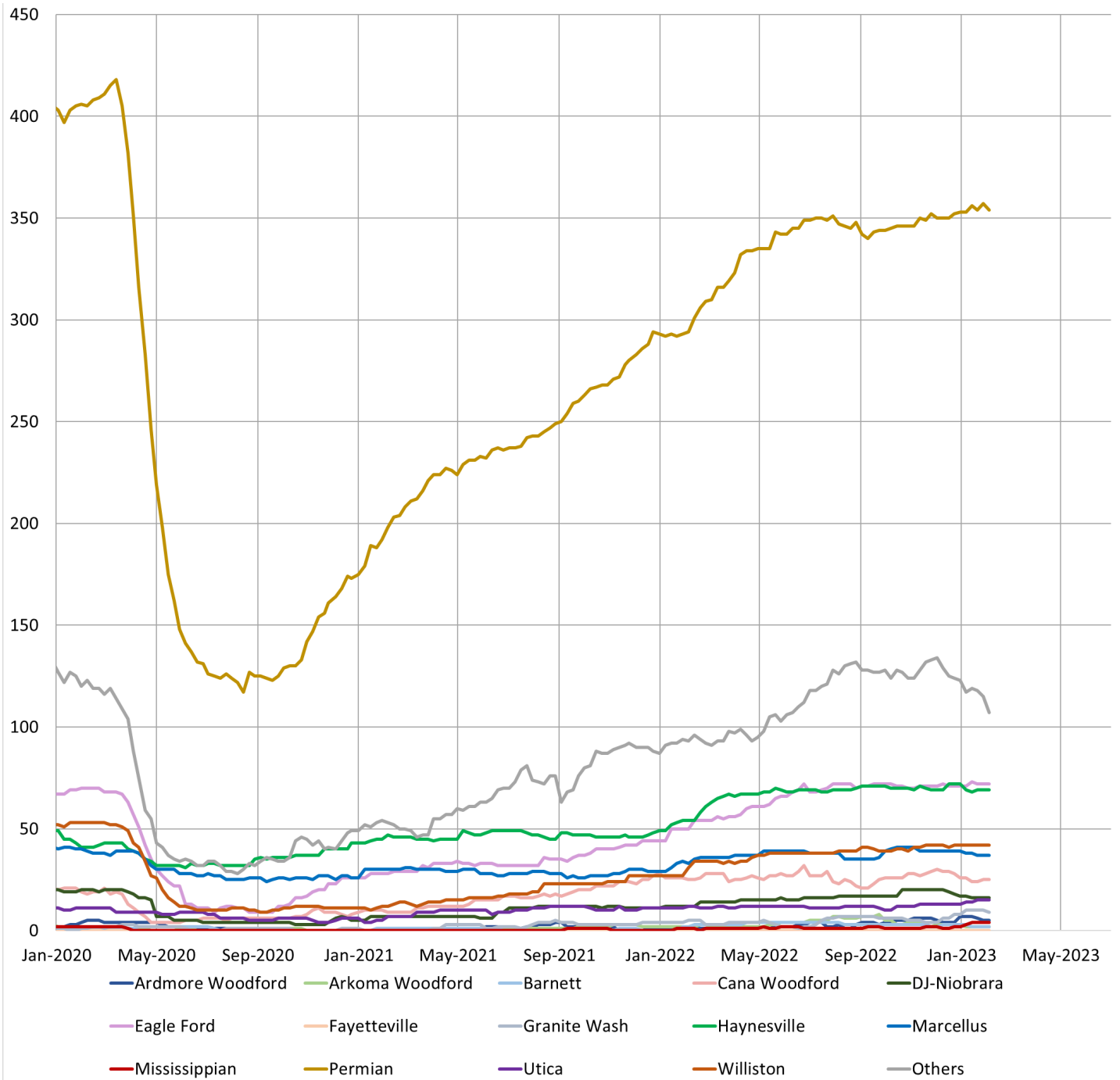
## DEAL VALUE BY US REGION (BY YEAR)



\*Source—PLS M&A Database (Charts exclude terminated deals)



## RIG ACTIVITY BY US REGION

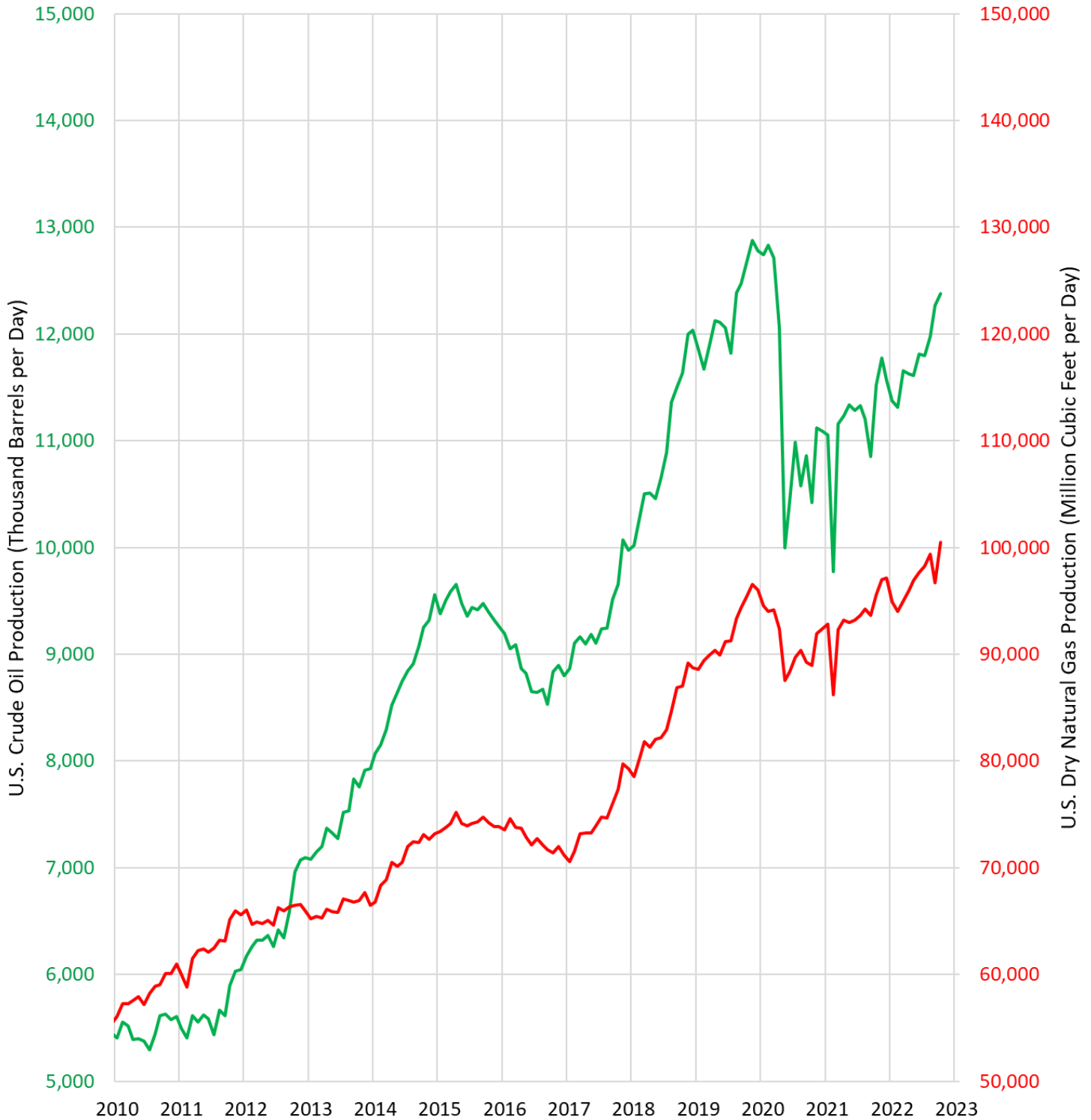


\*Source—Baker Hughes Weekly Rig Counts





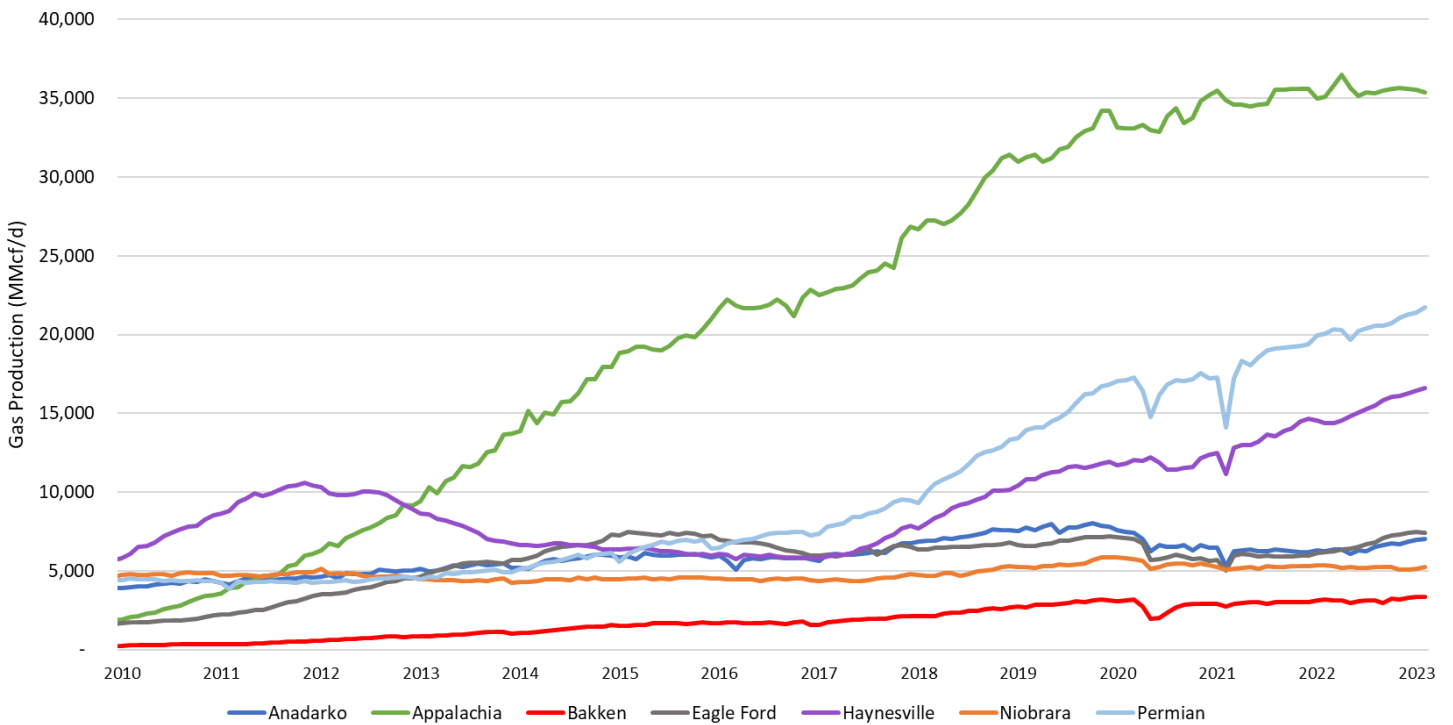
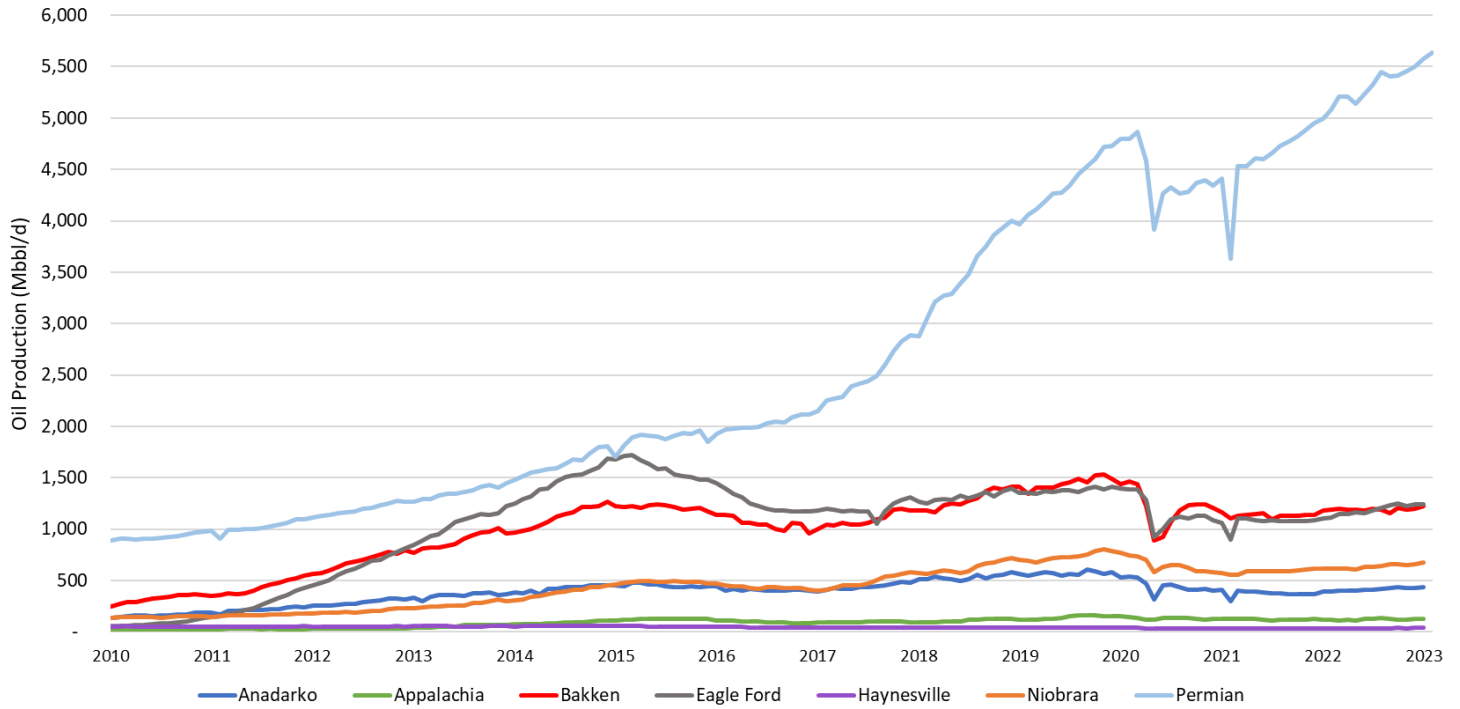
**US DAILY CRUDE (MMbbl) & DRY NATURAL GAS PRODUCTION (MMcf)**



\*Source—Energy Information Administration, United States (EIA)



## HISTORICAL PRODUCTION OF SELECTED US SHALE REGIONS



\*Source—Energy Information Administration, United States (EIA)



## **UPCOMING EVENTS**

### **January 2023**

[SPE Hydraulic Fracturing Technology Conference & Exhibition](#)

January 31-  
February 1

The Woodlands, TX

### **February 2023**

[NAPE Summit 2023](#)

February 1-3

Houston, TX

[Argus Americas Crude Summit](#)

February 15-17

Houston, TX

[GoM Energy Transformation Conference](#)

February 21

Houston, TX

### **March 2023**

[CERAWeek 2023](#)

March 6-10

Houston, TX

[4th American LNG Forum](#)

March 13-14

Houston, TX

[Qnections 2023](#)

March 27-29

Las Vegas, NV

[DUG Haynesville Conference & Exhibition](#)

March 28-29

Shreveport, LA

### **April 2023**

[World Oilman's Minerals & Royalty Conference \(MARC\)](#)

April 10-11

Houston, TX

### **May 2023**

[Offshore Technology Conference 2023](#)

May 1-4

Houston, TX

[DUG Permian Basin & Eagle Ford Conference & Exhibition](#)

May 22-24

Fort Worth, 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).



**Yvonne Trujillo** is a Senior Petroleum Engineer at Ralph E. Davis Associates, an Opportune LLP company. Yvonne has over 25 years experience in the oil and gas industry with extensive expertise in reserves engineering, SEC and PRMS/SPE reporting and economics and asset evaluation in conventional and unconventional reservoirs in the U.S. Lower 48. Yvonne earned a B.S. in Mechanical Engineering at Simon Bolivar University in Caracas, Venezuela and an M.S. in Petroleum Engineering at the University of Houston.



**David Edwards** is a Petroleum Engineer at Ralph E. Davis Associates, an Opportune LLP company. David has over two years of reserves engineering experience. Before RED, David was a Petroleum Engineer at Energy Advisors Group where he handled the technical processes for marketed conventional and unconventional assets across the Lower 48. He began his career with Longfellow Energy where he contributed to its engineering, operations, and A&D teams. David holds an MBA from The University of Texas Permian Basin and a B.S. in Petroleum Engineering from The University of Oklahoma.

