MICK 2022 Oil & Gas Report – E&P
Momentum Continues
Despite Recent Headwinds

Despite the headwinds from the left side of our federal government seeking to impose the green agenda to displace fossil fuels with more carbon-friendly sources (i.e., solar and wind), the U.S. E&P sector managed to hold its own in 2022 in terms of business growth, which was demonstrated through a year over year increase in onshore drilling activities, as well as a gradual increase in U.S. daily oil/gas production. As a result, oil/gas exploration and production ("**E&P**") capital raising within the retail financial sector saw a significant up-tick in 2022.

As was the case prior to COVID (2020), the fortunes for the E&P sector remain on a roller coaster ride into 2023, as oil prices, which reached $130 per barrel (bbl) in May 2022 and have settled into a more stable pricing pattern (i.e., $77 bbl WTI, Feb. 8, 2023). As to the prospects for natural gas, prices in the short term have fallen from the prices observed through much of 2022 due to a pattern of unseasonably warm weather. On a cautious note, natural gas storage levels come March 2023 will likely test domestic U.S. gas prices through much of this year, which hinges upon whether the warmer weather stays from now until April. Notwithstanding, the need for U.S. natural gas abroad on a long-term scale should help to present opportunities for better pricing into 2024 and future years (i.e., due to a gradually increasing capacity to export gas to Europe, as well as the effects of the lingering Russian-Ukraine conflict that could affect gas supplies into 2024).

Energy Sector Capital Summary

In 2022, we covered thirteen (13) companies which operate within the upstream sector of the energy value chain. This group collectively funded 22 private placement programs and raised $1.093 billion to support drilling and infrastructure, mineral rights acquisitions, and related E&P initiatives/projects within the retail investment channel. This represented a 96% year over year increase in private capital funding from what was reported by these companies in 2021 (i.e., ten sponsors, $555.974 million). This also resulted in the highest capital raise year from the E&P sponsor group that we cover since 2014.

Leading the way in terms of fundraising was U.S. Energy Development Corp. ("**U.S. Energy**"), at $332.68 million, which was followed by Mewbourne Development Corporation ("**Mewbourne**"), at $250.0 million, and MDS Energy ("**MDS**"), at $225.0 million. In terms of funding growth, eight of these sponsors reported year over year gains in fundraising, which helped to continue their capital raising momentum established in 2021 after the headwinds of the pandemic began to dissipate (i.e., with $273 million being the capital raise from the E&P group in 2020 during the pandemic year). A chart of the fundraising totals of the E&P sponsors we covered is provided below:

Table 1 - Capital Raised

Company	Strategy	2022 Raise	2021 Raise	2020 Raise
Mewbourne	*Drilling*-horizontal wells in the Permian Basin, Texas Panhandle, and Anadarko Basin	$250.00 MM	$119.80 MM	$55.31 MM

MDS	*Drilling*-horizontal wells in the Marcellus Shale Play	$225.00 MM	$146.919 MM	$60.0 MM
APX	*Drilling*-vertical Mississippian oil targets in the Illinois Basin	No raise 2022	$19.0 MM	$12.0 MM
S.T.L.	*Drilling*- horizontal wells in the Marcellus Shale Play	$42.50 MM	$29.5 MM	$17.3 MM
U.S. Energy	*Drilling*-horizontal drilling in the Permian Basin, Powder River, and Eagle Ford Shale Plays; the QOF is also an opportunity fund seeking working interests and other upstream assets	$267.93 MM drilling; $56.65 MM QOF; $8.10 MM §1031 program	$145.0 MM drilling; and $45.0 MM QOF program	$64.0 MM drilling; and $20.0 MM QOF program
Waveland	*Opportunity Fund* targeting minerals and non-operated working interests in the Bakken Shale Play	$42.64 MM	$13.255 MM	$22.0 MM
Resource Royalty	*§1031 Programs* acquiring minerals and royalties in STACK Play of Oklahoma	$32.9 MM	$11.067 MM	$5.373 MM
Montego Minerals	*§1031 Programs* acquiring minerals and royalties in the Permian Basin and East Texas	$62.20 MM	$19.730 MM	$12.5 MM
JHO	*Drilling*-shallower vertical oil zones in Tennessee	$5.00 MM	$6.704 MM	$4.35 MM
White Hawk Energy	*Royalty Fund* acquiring mineral rights, royalties, and overriding royalties	$65.70 MM	NA	NA
Barrow Shaver Resources	*Drilling*-horizontal wells in the E. Texas Bossier and Cotton Valley Plays	$4.50 MM	NA	NA
Texakoma Resources, LLC	*Drilling*-horizontal wells in the Granite Wash Play in Texas	$30.00 MM*	$20.00 MM	$15.00 MM

*Texakoma Resources raised capital through its captive broker-dealer for drilling within its one-well program platform in 2020-22; this sponsor will resume its launch of a diversified program platform in 2023.

2022 E&P Capital by Strategy

Total Capital:	$1,093,340,000
Contributing Sponsors:	12[1]
Drilling:	$824,930,000 (75%)
Opportunity Funds:	$99,340,000 (9%) (includes a QOZ fund)
Minerals/Royalties:	$168,900,000 (16%) (61% structured as direct interest)

Nine Internal Revenue Code ("**IRC**") §1031 eligible programs were wholly or partially funded in 2022 by Resource Royalty, Montego Minerals, and U.S. Energy. Overall, the §1031 energy program capital in 2022 ($103.20 million) increased from what was reported in 2021 ($31 million) and 2020 ($18 MM). Driving this upward trend in §1031 capital was the doubling of §1031 eligible offerings last year (i.e., nine offerings funded in 2022 vs. five in 2020), which was fueled by better oil/gas fundamentals coming out of COVID, as well certain acquisition related opportunities that have surfaced from the movement within the public E&P sector to monetize

non-operated drilling location assets in response to ESG, as well as Wall Street's expectations in general (i.e., with shareholders placing pressure on companies to use cash flows to pay distributions as opposed to enhancing drilling budgets). Based upon current oil market fundamentals and perhaps *longer-term* natural gas pricing due to anticipated LNG export growth, this E&P sponsor group appears to be fairly positioned to achieve a respectable volume of capital raising in 2023 and 2024.

We note that the size of the E&P sponsor group that we cover has been stable over the past couple of years (e.g., ten to twelve sponsors in 2017-2022), with drilling programs outpacing royalties and opportunistic funds in terms of fundraising. Due to the numerous pricing cycles we have dealt with, the fundraising of this sponsor group has been incredibly choppy since 2017 ($330 MM 2017, $401 MM 2018, $369 MM 2019, $273 MM 2020, $556 MM in 2021, and $1.1 billion 2022). This choppiness was caused by multiple headwinds that included severe market volatility, coupled with the fact that the sector continues to seek the reestablishment of investor trust that was lost because of performance failures by several companies that no longer raise capital in the retail channel. Based upon current oil market fundamentals in the near term, as well as longer term natural gas fundamentals, the E&P sponsor group appears to be reasonably positioned to maintain its momentum going into this year.

Alternative Energy Side Note

Representing the other side of the energy value chain, e2comply, LLC ("**e2C**") entered the retail broker-dealer channel in late 2020 and raised approximately $90 million from accredited investors in 2021 and 2022 pursuant to its senior secured bond offering, as well as an additional $28.50 million in 2022 from its Series B preferred share offering. The proceeds from these offerings are expected to be used by e2C to help fund its manufacturing of back-up power systems that enable certain companies that require power on a 24-7 basis (e.g., hospitals, utilities, bakeries) to function on a continuous basis, while also allowing such companies to run the back-up system at times when it is cost-effective to do so (which helps the consumer businesses to save money on their monthly power costs). Driving the appeal of e2C's offering, in part, was the Texas power crisis of 2021, which was caused by a winter storm that caused the state's electric grid operator to lose control of the power supply, leaving millions of people and many businesses without access to electricity. Subject to ongoing due diligence in 2023, e2C appears to be positioned to continue momentum with its capital raising efforts this year.

What's Driving
the Market Today?

The following market information was derived from multiple informational sources:

Oil

As of February 7, 2023, the WTI spot price for oil was $76.68 per barrel ("**bbl**") of oil, with the Brent spot price being $83.29 per bbl. The Energy Information Administration ("**EIA**") forecasts WTI spot prices to average $83 per bbl in 2023, **but with the EIA's estimate for 2024 dropping to $78 per bbl**.

Within its Short-Term Energy Outlook ("**STEO**") published in January 2023, the EIA reported a measure of stability in terms of oil supply and demand, with oil consumption worldwide (99.40 million bbls day) generally keeping pace with worldwide production (99.98 million bbls day). While the EIA anticipates oil prices to fluctuate from $75-85 bbl in 2023 and 2024 because of moderate consumption growth (102.80 million bbls per day estimated for 2023), the EIA has also acknowledged the concerns within the energy markets about global economic conditions and the pace in which China will continue to ease its COVID restrictions.

Domestically, the EIA reported in its January STEO that U.S. oil production reached 12.40 million bbls a day in October/November 2022, the most in any month since March 2020. The EIA expects that that oil production will average 12.40 million bbls per day in 2023 and 12.80 million bbls per day in 2024, which if attained would bring the U.S. E&P sector back to its production levels achieved prior to the onset of COVID in early 2022. **This rising trend in U.S. oil production is part of the thesis for the EIA's belief that oil inventories will keep pace with the moderate increase in world oil consumption this year and next.**

The EIA's oil pricing sentiment runs parallel with a pricing survey conducted by Reuters in December 2022. Reuters' survey of 30 economists and analysist forecasted that Brent Crude will average $89 bbl in 2023, thereby suggesting that oil prices may very well fall within a general range of $70-85 bbl on WTI in 2023 (i.e., due to a historical pricing spread of about 5-10%). Again, a darkening global economic backdrop fueled by COVID flareups in China, coupled with inflationary pressures in the U.S. and elsewhere will probably test such prices at times throughout 2023 and going into 2024. The magnitude of such uncertainties is exemplified within the U.S. futures market, which anticipates lower prices going into the next couple of years.

February 6, 2023

NYMEX Contract Month	Contract Price
Mar. 2023	$74.74/bbl
Sept. 2023	$74.11/bbl
Mar. 2024	$71.85/bbl
Mar. 2025	$68.10/bbl
Mar. 2026	$65.20/bbl

In his market report shown on February 2, 2023, Dan Steffens, President of the Energy Prospectus Group, presented a number of circumstances suggesting that oil/gas will continue as the predominant sources of world energy from now through 2050. While estimating the renewable sector's share of the world energy market will grow from 15% in 2020 to about 27% in 2050, the intermittency of solar/wind, couple with the need for fossil fuels as a supporting energy source for solar/wind infrastructure is expected to result in moderate consumption growth for all fossil fuels over the next 30 years. A chart illustrating oil/gas' estimated place within the world's energy value chain over the next 30 years is shown below:

Quadrillion BTU
Consumed Worldwide

Energy	2020	2030	2040	2050	CAGR

Source					2020-2050
ALL	602	705	795	886	1.30%
Renewables	89	136	184	235	3.30%
Nuclear/Biofuel	45	52	56	56	0.60%
Coal	156	156	168	177	0.40%
Nat. Gas	147	166	178	193	0.90%
Crude	165	195	209	225	1.0%

Source: EIA 2023

Natural Gas

On February 7, 2023, the natural gas spot price at Henry Hub was $2.60 per mcf, which is down considerably from the 2022 average of $6.45 per mcf. The drop in natural gas prices was occasioned by multiple headwinds that included (i) an unseasonably warm winter in the U.S., as well as (ii) a recent movement by the Biden administration and the U.S. Consumer Product Safety Commission to ban natural gas stove sales. The Biden administration's attack on natural gas stoves came about because of a research report published in December 2022 suggesting that 12% of childhood asthma cases in the U.S. can be attributed to natural gas stove use (but with Senator Joe Manchin and other Republican leaders vehemently contesting such findings in D.C.).

As a result of the above-mentioned headwinds, the EIA anticipates that the Henry Hub spot price will average $3.40 per mcf in 2023, down almost 50% from last year. Despite this, longer-term fundamentals for natural gas are more promising as the U.S. ramps up its liquid natural gas ("**LNG**") exporting capacity. On an international level, the EIA reports that the U.S. has become a leading exporter of LNG, which averaged 11.20 bcf per day through the first half of last year. On this point, Reuters reported in December 2022 *"... that U.S. LNG exporters boosted shipments to Europe by more than 137% in the first 11 months of 2022 from the same period in 2021, thereby supplying more than half of Europe's imported LNG and helping the region weather a more than 54% plunge in piped shipments from Russia.*" As reported by Reuters, the U.S. appears positioned to remain Europe's top LNG seller in 2023, as U.S. exporters have greater volumes of LNG available for spot market purchases than other major exporters.

Strip February 6, 2023

NYMEX Contract Month	Contract Price
Mar. 2023	$2.56/mcf
Apr. 2023	$2.64/mcf
May 2023	$2.79/mcf
June 2023	$2.97/mcf
Mar. 2024	$3.75/mcf
Mar. 2025	$4.03/mcf
Mar. 2026	$4.08/mcf

Natural gas price average – past five years

2018	$3.15/mcf
2019	$2.58/mcf
2020	$2.03/mcf
2021	$3.89/mcf
2022	$6.45/mcf

What's Going
On in the Field?

In November 2022, U.S. oil production was 12.375 million bbls per day, which was 1.0 million bbls per day more than what was reported in January of last year. Despite this significant growth in our daily production, oil prices have managed to rebound from a two-year low of $65 per bbl (December 9, 2021) due to the resurgence of oil consumption across the globe. This increase in domestic production is further reflected by a higher U.S. rig count, which has increased from 392 rigs running in February 2021 to 745 rigs running currently.

Basin	Feb. 3, 2023 Rig Count	Feb. 2022 Rig Count	Feb. 2021 Rig Count	Jan. 2020 Pre-COVID
Arkoma/Woodford Region	32	26	9	23
Barnett Shale	2	2	1	2
DJ-Niobrara	16	12	5	20
Eagle Ford Shale	72	50	28	67
Granite Wash	9	5	0	1
East Texas & Haynesville Shale	69	54	47	49
Marcellus Shale	37	33	30	40
Mississippian Play	4	1	0	2
Permian Basin	354	294	198	403
Utica Shale	15	12	7	11
Williston Basin/Bakken	42	31	12	52

Baker Hughes, 2/3/23, 2/4/22, 3/6/21

On a positive note, oil drilling has increased to various levels within ten of the eleven oil/gas basins covered by Baker Hughes' data. The major U.S. basins that have experienced the most growth from a year ago include the Eagle Ford (up 44%), Permian (20%), Granite Wash Play (80%), and Bakken Play (35%). Certain natural gas producing areas have also managed to hang on to some of the momentum from 2022, as evidenced by the rig counts within the Arkoma/Woodford (up 14%), Utica (up 20%), and Marcellus Play (up 12%).

Motivation to Drill –
What are the Break-Evens?

Despite the market fundamentals for oil in 2023-24, a stable market commands a world supply/demand balance. Against this backdrop, today's oil market fundamentals present opportunities for U.S. E&P companies to continue their profits into this year by increasing their

drilling. An illustration "*suggesting*" how much profit can potentially be achieved by oil/gas producers is shown in the following table (with break-evens reported on a "**per bbl**" basis):

Break Even Points

Play	**Avg. Break Even Drilling**	**Avg. Price to Recover Op. Costs**
Permian-Midland	$51	$29
Permian-Delaware	$50	$28
Permian-Other	$54	$33
Eagle Ford	$48	$23
Other U.S. Shale	$60	$35
Other U.S. Non-Shale	$69	$38

Federal Reserve Bank of Dallas survey
Report updated Jan. 12, 2023

Based upon the findings of a survey published by the Federal Reserve Bank of Dallas (Dec. 29, 2022), many E&P companies are, in fact, gearing up to increase their drilling over the next 12 months. Within a survey of several executives from 149 oil/gas drilling and field service companies, the average forecasted oil price for year-end 2022 was $73 per bbl, with the group of executives predicting natural gas to end the year at $5.93 per mcf. Coincidentally, and based upon their viewpoints about oil/gas prices, 64% of the executives from the 148 surveyed companies stated that their companies intend to increase their cap. ex. spending over the next 12 months, with another 22% also stating their plans to maintain their present cap. ex. spending levels. Of 90 surveyed drilling company executives, the three biggest perceived headwinds to increasing their oil/gas production in 2023 are (i) drilling cost inflation, (ii) maturing asset bases, and (iii) capital availability. *While acknowledging that there are forces that might serve to temper the E&P sector's motivation to drill (e.g., the Biden administration's disdain for the sector),* ***money continues to talk****.*

Market Volatility –
Revisiting Where We Have Been

It goes without saying that the past 20 years have been a roller coaster ride for oil/gas prices, as we have seen oil as high as $140 per bbl (July 2008) and as low as negative $37 per bbl (April 2020). While bull markets are a welcomed development for those that guide investors seeking to put money into the E&P sector, history teaches us that we need to be disciplined in terms of our return expectations. The cycles of the past several years can be summarized as follows:

- A floundering real estate market in 2007-2008 due to the sub-prime loan market collapse motivated many in the financial services sector to move money from real estate to crude, which drove oil prices to $140 bbl in July 2008. However, the Great Recession that hit in late 2008 dropped oil back to $30 bbl before a recovery to $60-80 bbl occurring late 2009/2010.

- The shale boom that took U.S. oil production from under four million bbls oil per day in late 2008 to more than nine million bbls per day in 2014 over-supplied the global

market. Saudi Arabia's failed attempt to regain market share in 2014 caused the oil price to decline from over $100 per bbl to under $30 per bbl. The double bottom in early 2016 appeared to be the end of this cycle, and oil moved back over $70 per bbl in the summer of 2018.

- The U.S. vs. China trade war took oil back under $50 per bbl. The signing of phase one of the trade agreement had oil back on track to the $70s. In the first week of 2020, oil was trading over $62 per bbl, and everyone thought the price was heading higher.
- Then came COVID and the oil crash in April 2020. From April through the first week of May, we saw prices settle below $20 bbl and even dip below $0 for a day.
- COVID began to loosen its grip on world economies in 2021, which caused the world's appetite for crude to resume significantly. This caused worldwide oil consumption to spike from 91 million bbls day in 2020 to 97 million bbls day in 2021, yet oil prices moved back to an $80-90 bbl level in January 2022.
- The Russian-Ukraine crisis escalated in earnest in February 2022, sending oil prices soaring above $130 bbl, and with the perception of constrained natural gas supplies also causing prices to average $6.45 mcf last year.
- Finally, the balancing of world oil supply/demand results in oil prices returning to a more stabilized level in January 2023. Unseasonably warm weather, coupled with pressure from the Biden administration to curb sales of natural gas stoves also resulted in natural gas prices dropping below $3 per mcf in early February 2023.

Despite the rhetoric in the press, White House and on Wall Street about renewable energy displacing crude as the world's chief source of energy, the world's need for crude as a viable energy source remains steadfast. **That said, we MUST not forget the inherent volatility risks associated with oil/gas commodities, and how that has played to the chagrin of many public and private E&P companies over the past several years that over borrowed and eventually collapsed**.

The Need to Stay Disciplined
With Your E&P Due Diligence

Despite some welcomed optimism about the prospects of oil (currently) and natural gas (longer-term, late 2023 and 2024), we must remain steadfast in our underwriting of oil/gas companies, because no one is immune to the next pricing cycle. As such, we must pay attention to break even prices and the break points whereby an E&P sponsor's pro forma becomes unprofitable. As cap. ex. and lease operating costs have increased by 50% and greater in many areas as a result of recent oil pricing trends, we must *stay the course* in the quest for sponsors and products that have the best possibilities for success under less fortunate circumstances. **As we have written in our past year-end reports, stay committed to cautious due diligence. As history has taught us, the next cycle will come – we just don't know when**.

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