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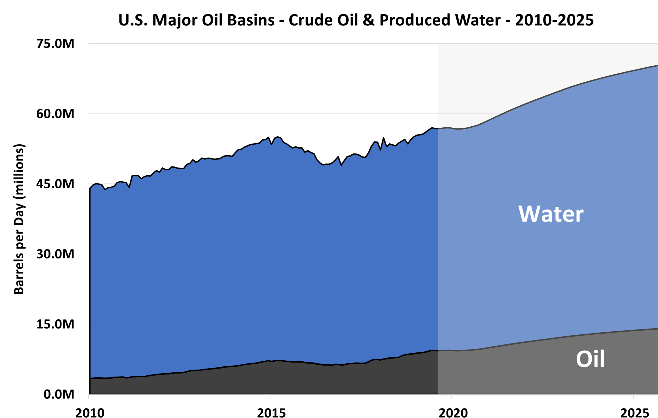
INDUSTRY BRIEF

Energy Stat: What Opportunities Exist In Oilfield Water And How Should This Emerging 'Midstream' Segment Be Valued?

In conjunction with today's 50-page U.S. Oilfield Water Primer, we're highlighting an evolving (and not well known or understood) segment of the energy landscape. First, oilfield water is among the fastest growing components of the energy space - a point we noted with a Stat back in July 2019. Water is both a major input into *hydraulic* fracturing, as well as a major output in the form of produced water (which accompanies oil and gas production). Second, and more germane to today's Stat, the water business is in the midst of a paradigm shift as it transforms from an in-sourced E&P or oilfield service activity, to one that closely mirrors the traditional U.S. Midstream G&P section of the energy value-chain. However, many investors are unfamiliar with the space, or more acclimated to evaluating oilfield water companies/assets within the context of the Oilfield Services sector - a point we'll explore. Regardless, 2019 was a busy year in the space and we expect the investment community will have growing exposure to the U.S. Oilfield Water space in 2020. **In today's stat we will: (1) refresh forecasts from our differentiated U.S. produced water model in the wake of the broader slowdown in U.S. upstream activity; (2) discuss the various functions of U.S. Oilfield Water and how this compares to U.S. midstream; (3) compare and contrast historical and current U.S. Oilfield Water and U.S. Midstream valuation; and (4) summarize other key takeaways from the accompanying U.S. Oilfield Water deep-dive.**

Reviewing our differentiated Water Production by Play Model. Recall, we've built a proprietary, bottoms-up produced water model by play ("PBP") comparable to our oil/gas models using play-specific decline curves on a per-well level and our macro activity assumptions (rather than simplistic analyses simply extrapolating an assumed water-to-oil ratio - or WOR - across an oil production forecast). Beyond that, we believe "associated" water production forecasting is still a lightly covered topic across the Street. We've updated our forecast from last May in the chart on the right. Illustrating this segment's massive growth potential, we estimate U.S. water production is currently over 47 million barrels per day, and grows to 57 mbpd by 2025. Most of this growth is confined to the Permian, where volumes grow from 18.3 mbpd to 31.8 mbpd over the same period.



Source: EIA, Drilling Info, Baker Hughes, Raymond James Research

Make no mistake, this is still an upstream sensitive business - but water production is slightly more resilient than oil/gas. Over the past 18 months, we have shifted our estimates to be "low on the Street" for U.S. oil production growth (which we've detailed extensively). Importantly though, water-oil ratios have not changed (or have even improved). Looking to 2020, our production growth estimates have shrunk from +1.1 million bpd to +0.5 mbpd for water, with oil down from +0.6 mbpd to +0.28 mbpd of growth. Another frequent exercise is production modeling at RJ vs. strip oil/gas prices — at strip, we see ~14% lower water production in 2025 and ~17% for oil versus our RJ Oil model.

What evolution is taking place in the U.S. Oilfield Water space? As we alluded to above, the water services industry is going through a series of operational and financial changes that align the business more closely to midstream - typically a higher relative value business - than oilfield services. The biggest driver of this is on the operational front, where the produced water handling and disposal business is growing to critical mass in several regions - notably the Delaware and Midland basins. This business has helped nudge the broader U.S. Oilfield Water category away from rig/completion sensitive volumes (and cash flows) to steadier, more recurring business along the lines of what we see in the U.S. Midstream space. Additionally, spot pricing is being replaced by long-term contracts and volumes are being increasingly transported by pipes rather than trucks, complete with acreage dedications - two other hallmark characteristics of the midstream space. Following a host of transactions, capital raises, and operational expansions, the space has garnered some initial notoriety from the investment community. All this begs the question, how should this emerging U.S. midstream sub-sector be valued?

Please read domestic and foreign disclosure/risk information beginning on page 9 and Analyst Certification on page 9.
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What are the various water services that companies engage in and how do they compare to "traditional midstream"? We compare and contrast water businesses to midstream below, and explore saltwater disposal wells (SWDs) in more detail lower in the page. While water businesses don't stack up well relative to regulated midstream businesses, there are a lot of similarities between it and midstream G&P - a point we expand upon below. Although midstream G&P is under some investor pressure of its own right now (as upstream activity slows, like we mentioned on page 1), there's still a valuation spread between these two sections of the energy market. Narrowing this gap would be beneficial for water businesses and help investors over time.

- **Freshwater sourcing and distribution:** The vast majority of frac water is sourced from water wells and surface water, although use of recycled water is increasing, particularly of frac flowback. Freshwater is transported to the well site via truck, hose, or pipeline — with midstream companies particularly focused on fixed pipeline delivery networks. In our view, fresh water sourcing and distribution warrants a multiple in-line with oilfield services as the business is highly dependent on E&P companies drilling new wells.

- **Saltwater disposal:** Waste water is produced during the hydraulic fracturing process (frac flowback) and - more prevalently - as a byproduct of oil and gas production (produced water or saltwater). This is a dirty business with salt, heavy metals, and naturally occurring radioactive material (NORM) suspended in the water. Typically, an activity done by E&Ps themselves, U.S. Midstream companies are becoming increasingly involved - particularly with SWDs. This business is the most conducive to midstream G&P-style arrangements - and we think valuation should be similar. Eventually, flatter water decline curves and lower required capital investment (leading to higher ROICs) could further improve relative valuation.

- **Water treatment (recycling):** Water recycling (removing bacteria, dissolved oil, and metals) is the treatment of produced or flowback water for any sort of re-use. Waste water can be reused in the fracking process. Water recycling treats a small portion of produced water today, but environmental concerns may drive increased use of recycled water by E&Ps. Although recycling is currently a low-margin proposition with low valuations, the business is evolving towards interconnected pipeline systems with steady visibility towards fracking reuse. ESG pressure and economies of scale could make further integrating recycling critical for water midstream companies. Its operational evolution, positive ESG characteristics, and growth potential could eventually drive a recycling valuation multiple in-line with the low-end of U.S. midstream over time.

Qualitative Characteristics Impacting Relative Valuation		
Basin/Play	Contracts	Service
Delaware	MVCs	Fully Integrated
Midland	Acreage Dedications	Saltwater Disposal
Bakken/Eagle Ford	Rate Agreements	Piped Recycling
Scoop/Stack - Marcellus/Utica	Handshake Agreements	Freshwater Distribution
Other	Spot Pricing	Recycling

Higher Valuation ↑

Source: Raymond James research

What other characteristics make saltwater disposal operationally and financially similar to midstream?

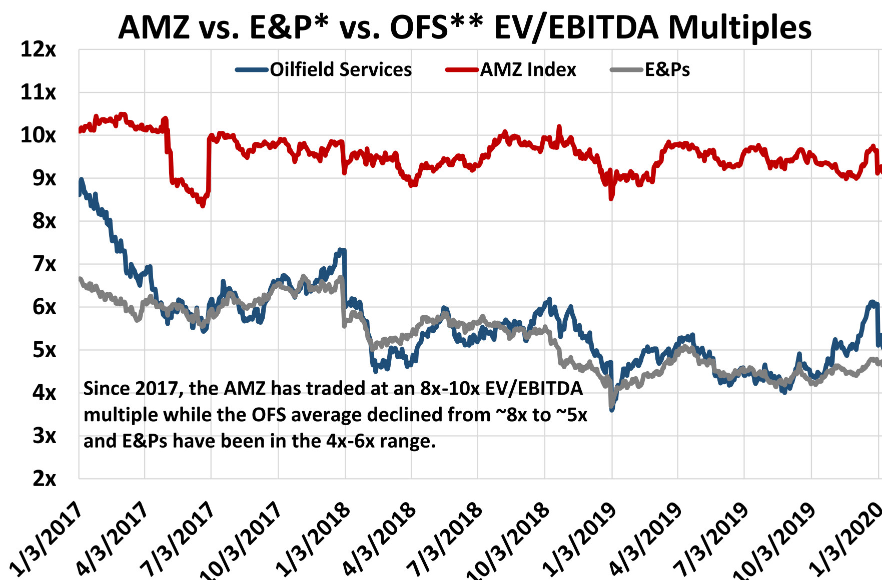
- **Operations:** Saltwater disposal primarily services producing wells and remains somewhat viable when drilling activity slows down. These services are critical to keep wells producing valuable hydrocarbons from being shut-in. These recurring cash flows - and associated growth vs. decline potential - literally mirrors midstream G&P.

- **Contracts:** This business is increasingly adopting multi-year contracts closer to the midstream model (albeit shorter 5-10 year SWD contracts vs. 10-20 year G&P deals as an illustration). These contracts typically include fixed-fee agreements (with escalators), acreage dedications, and (in some cases) minimum volume commitments - all of which are staples of "traditional midstream".

- **Network/system approach:** Midstream water companies are also adopting a "super-system" approach directly from the midstream space (e.g., transporting produced water from wellhead to central disposal sites for producer customers). These increasingly pipeline systems with network capabilities and redundancies improve reliability and margins/utilization. The ability to provide flow assurance is also a differentiator with upstream customers and facilitates acreage dedications and minimum volume commitments - again similar to midstream.

- **Potential for "downstream" integration:** A "core" SWD business could evolve towards a more integrated approach over time as recycling and re-distributing treated water for various uses (agricultural, hydraulic fracturing, etc.) are added to the mix. This would somewhat approximate G&P companies with long-haul pipelines to end-markets and their own downstream facilities.

Where do midstream valuation multiples currently stand? Investors assessing midstream water services as an oilfield services business and not "truly midstream" would represent a significant overhang to the sub-sector. In our view saltwater disposal should be considered "midstream," while other functions are sure to foster debate. In the chart to the right, we evaluate historical midstream EV/EBITDA multiples using the AMZ total return index (AMZX). Note the significant premium that midstream earns (AMZX at ~9x EV/EBITDA) vs. E&Ps and oilfield services (~4.5x to ~5x). Historically, midstream has traded even higher, in the 9-12x range.



Source: Bloomberg, Raymond James research. Priced: 1/21/20. *S&P E&P indices. **Represented by average multiple of OFS companies cited in the appendix.

However, the Midstream G&P space is often perceived as the higher risk component of midstream and typically trades at a ~1-2 turn discount to the broader sector. Stock-specific idiosyncrasies (read: counter-party growth vs. risk) can be highly important in this sub-segment. In recent months, we've seen the G&P valuation discount widen relative to the overall midstream space. This dynamic is crucial to the question of midstream water asset valuation.

Recent water transactions provide some insight into market value. As displayed in the chart to the right, water assets have historically transacted at a 5x-11x EBITDA multiple. Importantly, we've seen transaction multiples improve as water services increasingly resembles traditional midstream. Moving forward, we believe a set of important distinctions will dictate water asset quality (and transaction multiples, as a result). As with G&P assets, basins will play an important role, with assets in the Permian (especially the Delaware) earning a premium relative to non-Permian assets.

M&A Comps - Water Disposal & Infrastructure

Date	Buyer	Target	Primary Area/Basin	Transaction Value ($MM)	EBITDA Multiple
7/9/14	NGL Energy Partners	Undisclosed	Eagle FordPermian	$82.9	5.2x
9/18/15	Antero Midstream Partners	Antero Resources	Appalachia	$1,035.9	8.8x
11/5/15	Rice Midstream Partners LP	Rice Energy	Appalachia	$200.0	5.4x
7/18/17	Select Energy Services	Rockwater Energy Solutions	Multiple	$515.8	7.4x
9/12/17	Enable Midstream Partners LP	Align Midstream	Ark-LA-TX	$300.0	10.0x
2/7/18	Tallgrass Energy Partners LP	Buckhorn	Bakken	$140.0	5.0x
10/5/18	Nuverra Environmental Solutions	Clearwater Solutions	Marcellus / Utica	$41.9	5.6x
10/31/18	WaterBridge	Halcon	Delaware	$325.0	11.0x
12/20/18	WaterBridge	NGL Energy Partners assets	Delaware	$239.0	7.5x
5/14/19	NGL Energy Partners	Mesquite Disposal	Permian	$890.0	7.0x
5/17/19	GIC	Waterbridge minority interest	Multiple	$560.0	9.0x
5/23/19	Initial Public Offering	Rattler Midstream LP	Permian	$2,652.0	9.5x
9/26/19	NGL Energy Partners	Hillstone	Permian	$600.0	7.0x
			Average	**$583.3**	**7.6x**
			Median	**$325.0**	**7.4x**

Source: Raymond James research, NGL Company Materials

Further, contract profile will be key, with sizable acreage dedications and minimum volume dedications elevating multiples. Finally, infrastructure buildout remains important, as interconnected pipelines provide improved margins. We expect private water company IPOs to shed more light on the transaction market over the next few years (to throw an example out there, Waterbridge, which potentially has the largest water services footprint in the U.S. would be a primary candidate). In the table above, average/median water valuations land in the ~7.5x multiple range despite a broad mix of geographies, sizes, and qualities - a positive statement overall for the "water as midstream" theme - and especially for Delaware midstream water businesses.

Other key takeaways from the accompanying U.S. Oilfield Water deep-dive: While our Stat this week focused primarily on valuation, our oilfield water primer takes a much deeper look at the activities involved in water management. This includes:

- **Detailed SWD Economics & Water Super-System evaluation.** Water as midstream in many ways relies upon contracts, which justify fixed asset investments. These fixed assets, at their greatest scale, create water super-systems with potential to meaningful produce the cost to complete wells and deal with produced water. We believe the industry is headed for larger water midstream companies that capture the

benefits of scale that can arise. In addition, we take a look at why SWDs make for such profitable investments, and why the barriers to entry are trending upwards as permitting becomes more difficult.

- **Full-cycle water management dissection.** We break down all the steps of pre- and post-frac water management, and the activities entailed at each step. This expands upon our valuation discussion from the Stat today, including the investment characteristics such as capital intensity and barriers to entry for each activity.
- **The future of the water midstream asset class.** As PE water midstream companies look to monetize their investments, we predict one final wave of consolidation as companies prepare for public markets. This is particularly true in the Permian, where we estimate over 200 companies own fewer than 10 disposal wells (with 30 companies above this line). Additionally, we believe upwards of 70% of active SWDs in the Permian are still owned by E&P companies, which have clear incentives to monetize these assets. Consolidation is both inevitable and a priority in the space.
- **Water volume modeling in light of "peak shale" productivity concerns.** In the face of slowing gains in new well productivity (which may even turn negative in coming years), we address "peak shale" concerns and how our model has changed from its first publishing in July of 2019. Child well productivity declines are **real** in the Permian, but thus far we lack evidence that this has affected water-oil-ratios.

Conclusion. Water services represents a significant growth opportunity for midstream companies - U.S. oilfield water production is currently just over ~47 million barrels per day, and our proprietary model projects it grows to ~56 million barrels by 2025. Growth will be centralized in the Delaware where the water-to-oil ratio is estimated above ~4:1 and hydrocarbon production economics are among the best in the U.S. Beyond this volume forecast, we view saltwater disposal as the "crown jewel" of midstream water services due to: 1) its necessity in order to keep production flowing; 2) the more recurring nature of its volume/cash flows (relative to other water services); 3) barriers to entry in SWD permitting; and 4) network effects similar to midstream. Water recycling is another important service that we think has under-appreciated growth potential from a low-margin, low valuation business to one with economies of scale and "looped" integration with SWD operations (not to mention its ESG tailwinds). We outline why these water businesses, which historically traded at ~5x EV/EBITDA could see multiple expansion of ~50% or more over time. Within this space, E&Ps are likely to continue evaluating options to eliminate in-house water treatment, distribution, and disposal in order to reduce capex and improve free cash flows, which will provide further opportunities for 3rd party companies. Valuations permitting, this could facilitate further M&A activity - with private players and public carve-outs gearing towards IPOs as their businesses reach critical mass. We think investor exposure to this space is only just getting started. If these themes seem intriguing, we encourage readers to explore our Oilfield Water primer also published this morning.

RJ covered stocks to highlight:

- **NGL (Outperform):** As shown in the appendix table below, NGL currently trades at a 2021E EV/EBITDA multiple of ~7.1x compared to G&P stocks at ~8.2x. We believe the stock is undervalued given its leverage to water services in the Delaware and NGL's ownership of the Grand Mesa pipeline and expect the stock to re-rate as water volumes from its Hillstone and Mesquite acquisitions ramp.
- **RTLR (Outperform):** The stock trades at a 2021E EV/EBITDA multiple of ~7.0x compared to G&P stocks at ~8.2x. Although earnings from its long-haul pipeline interests are in question, we view RTLR as deserving of a valuation in-line with G&P due to the partnership's contract quality (15-year contracts with extension potential) and supportive relationship with FANG.
- **NOV (Outperform):** National Oilwell Varco is a major producer of oilfield equipment, that provides a "picks and shovels" play on water midstream growth. Produced water is more corrosive than steel can handle, but requires higher pressure than HDPE can handle. This leads many operators to turn to NOV's fiberglass pipes, which has seen large orders that make up the spines of many water systems.

Appendix 1: Midstream G&P Comps table

RAYMOND JAMES ENERGY RESEARCH COMPARISON TABLES: MIDSTREAM G&P													
Ticker	Name	Price	Forward Yield		Price / DCF		Enterprise Value / EBITDA		2018-21 Dist.	2018-20 DCFPS/U	Market Cap ($ MM)	Enterprise Value ($MM)
		1/24/20	2020E	2021E	2020E	2021E	2020E	2021E	CAGR	CAGR	2020	2020
MIDSTREAM G&P												
ALTM	ALTUS MIDSTREAM	$2.06	0.0%	9.7%	1.0x	0.8x	11.4x	8.3x	NM	NM	$154	$2,196
AM	ANTERO MIDSTREAM CORPORATION	$6.19	19.9%	19.9%	4.7x	4.2x	7.4x	6.8x	31.5%	NM	$3,034	$6,067
CEQP	CRESTWOOD EQUITY PARTNERS LP	$30.22	8.1%	8.5%	6.3x	6.3x	8.5x	8.2x	2.4%	23.3%	$2,187	$5,152
DCP	DCP MIDSTREAM LP	$22.77	13.7%	13.7%	6.3x	6.0x	9.5x	9.3x	0.0%	0.7%	$4,745	$10,643
ENLC	ENLINK MIDSTREAM LLC	$5.49	9.1%	9.1%	3.7x	3.7x	7.8x	7.6x	NM	8.5%	$2,689	$8,568
EQM	EQT MIDSTREAM PARTNERS, L.P.	$25.58	18.1%	18.2%	5.3x	10.5x	9.1x	8.8x	1.8%	9.6%	$5,128	$12,152
NBLX	NOBLE MIDSTREAM PARTNERS	$22.70	12.7%	14.0%	6.3x	5.4x	14.9x	7.7x	9.7%	32.4%	$2,048	$3,907
OMP	OASIS MIDSTREAM PARTNERS LP	$16.55	14.6%	16.9%	2.2x	2.1x	7.0x	5.8x	12.9%	59.7%	$332	$1,079
WES	WESTERN GAS PARTNERS, L.P.	$18.70	13.6%	14.0%	6.0x	5.6x	9.6x	8.6x	2.6%	65.3%	$8,472	$16,251
MIDSTREAM G&P AVERAGE			12.2%	13.8%	4.7x	4.9x	9.5x	7.9x	8.7%	28.5%	$3,199	$7,335
MIDSTREAM G&P MEDIAN			13.6%	14.0%	5.3x	5.4x	9.1x	8.2x	2.6%	23.3%	$2,689	$6,067
NGL	NGL ENERGY PARTNERS LP	$10.69	14.6%	14.6%	3.7x	3.2x	7.9x	7.1x	0.0%	30.9%	$1,349	$5,385
RTLR	RATTLER MIDSTREAM PARTNERS LP	$16.62	6.9%	8.1%	7.8x	7.0x	8.0x	7.0x	NM	NM	$2,341	$2,666

Source: Company / partnership presentations, Raymond James estimates; Factset.

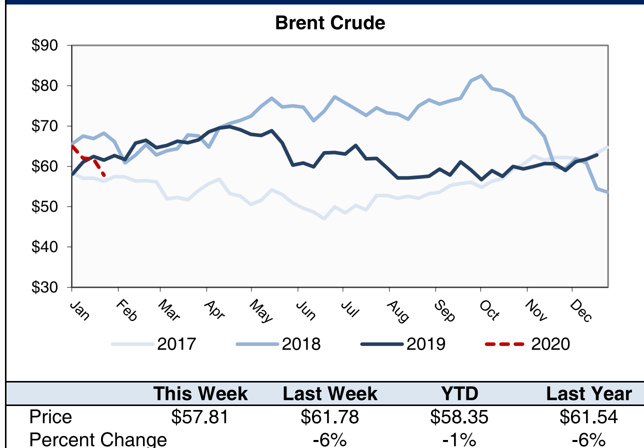
Appendix 2: OFS EV/EBITDA Constituents

U.S. On-Shore Oilfield Services Companies	
HAL	PUMP
LBRT	RES
NBR	RNGR
NEX	SOI
NINE	TTI
NR	WHD
PTEN	WTTR

Raymond James Weekly Oilfield Review

For the week ending: 1/24/2020

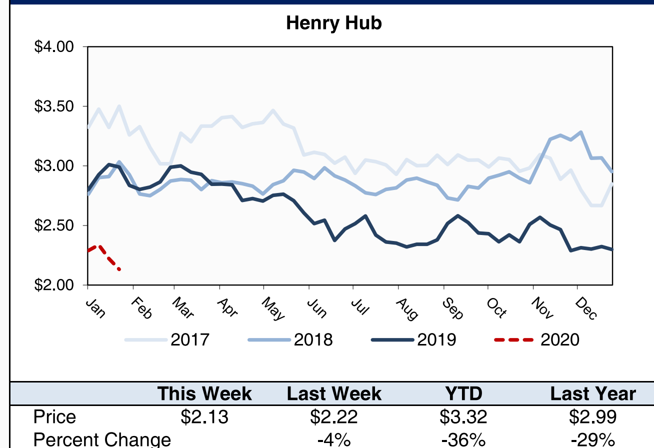
12 Month Oil Calendar Strip



	This Week	Last Week	YTD	Last Year
Price	$57.81	$61.78	$58.35	$61.54
Percent Change		-6%	-1%	-6%

Source: Bloomberg, Raymond James

12 Month Gas Calendar Strip



	This Week	Last Week	YTD	Last Year
Price	$2.13	$2.22	$3.32	$2.99
Percent Change		-4%	-36%	-29%

Source: Bloomberg, Raymond James

	This Week 1/24/2020	Last Week 1/17/2020	Last Year 1/25/2019	Change From: Last Week	Change From: Last Year
U.S.Rig Activity - Onshore					
U.S. Oil	676	673	862	0.4%	-22%
U.S. Gas	115	120	197	-4.2%	-42%
U.S. Total	**791**	**793**	**1059**	**-0.3%**	**-25%**
U.S. Horizontal	710	709	932	0.1%	-24%
U.S. Directional	47	44	59	6.8%	-20%
U.S. Offshore - Gulf of Mexico					
U.S. Offshore	21	20	20	5.0%	5%
Fleet Size	69	69	72	0.0%	-4%
# Contracted	40	40	33	0.0%	21%
Utilization	58%	58%	46%	0.0%	26%
Canadian Rig Activity					
Rig Count	244	244	232	0.0%	5%
Stock Prices					
OSX	68.40	74.99	97.86	-8.8%	-30%
S&P 500	3,295.45	3,329.62	2,664.76	-1.0%	24%
DJIA	28,989.73	29,348.10	24,737.20	-1.2%	17%
Alerian MLP Index	213.61	226.55	248.77	-5.7%	-14%
S&P E&P	3,111.56	3,111.56	4,655.46	0.0%	-33%
Inventories					
U.S. Gas Storage (Bcf)	2,947	3,039	2,370	-3.0%	24%
Canadian Gas Storage (Bcf)	477	510	515	-6.6%	-7%
Total Petroleum Inventory (k)	1,294,398	1,296,298	1,267,110	-0.1%	2%
Spot Prices (US$)					
Oil (Brent)	$60.81	$64.85	$61.64	-6.2%	-1%
Oil (W.T.I. Cushing)	**$54.35**	**$58.54**	**$53.69**	**-7.2%**	**1%**
NGL Composite	$20.50	$20.89	$26.20	-1.9%	-22%
Gas (Henry Hub)	$1.89	$2.00	$3.18	-5.5%	-40%
Residual Fuel Oil (New York)	$11.11	$10.52	$10.15	5.5%	9%
Gas (AECO)	$1.57	$1.82	$1.51	-13.7%	4%

Sources: Baker Hughes, ODS-Petrodata, API, EIA, Oil Week, Bloomberg, Raymond James

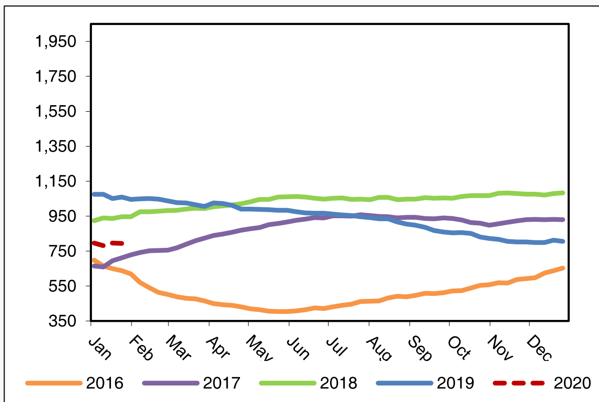
U.S. Rig Count Breakdown

	1/24/2020	1/17/2020	W/W Δ	YTD Δ	YTD % Δ	Y/Y Δ	Y/Y % Δ
Total Count							
U.S. Rig Count	**794**	**796**	**(2)**	**(2)**	**0%**	**(265)**	**-25%**
By Basin*							
Permian	403	400	3	6	2%	(78)	-16%
Eagle Ford	79	79	0	3	4%	(10)	-11%
Bakken	53	53	0	2	4%	(5)	-9%
Haynesville/Bossier	43	45	(2)	(6)	-12%	(12)	-22%
Marcellus	39	40	(1)	(1)	-3%	(19)	-33%
Cana Woodford	27	26	1	2	8%	(55)	-67%
Gulf of Mexico	21	20	1	(1)	-5%	(1)	-5%
Powder River Basin	18	19	(1)	0	0%	(1)	-5%
DJ Basin	17	17	0	(1)	-6%	(8)	-32%
San Joaquin Basin	11	11	0	0	0%	7	175%
Utica	11	10	1	0	0%	(7)	-39%
Uinta	5	5	0	1	25%	(3)	-38%
Pinedale	4	5	(1)	(2)	-33%	(6)	-60%
Piceance Basin	3	3	0	0	0%	(4)	-57%
Mississippi Lime	3	3	0	0	0%	(5)	-63%
Arkoma Woodford	2	2	0	(1)	-33%	(5)	-71%
Barnett	1	1	0	0	0%	(2)	-67%
Granite Wash	1	1	0	1	n/a	(2)	-67%
Other	53	56	(3)	(5)	-9%	(49)	-48%
Drill For							
Oil	676	673	3	6	1%	(186)	-22%
Dry Gas	67	70	(3)	(9)	-12%	(32)	-33%
Wet Gas	49	50	(2)	1	2%	(50)	-51%
Miscellaneous	3	3	0	0	0%	3	0
Trajectory							
Horizontal Oil	611	607	4	15	3%	(155)	-20%
Horizontal Gas	99	102	(3)	(6)	-6%	(67)	-40%
Horizontal	710	709	1	9	1%	(222)	-24%
% Horizontal	89%	89%	0%	1%		1%	
Vertical/Directional Oil	65	66	(1)	(9)	-12%	(31)	-32%
Vertical/Directional Gas	16	18	(2)	(2)	-11%	(15)	-48%
Vertical/Directional	84	87	(3)	(11)	-12%	(43)	-34%

Source: Baker Hughes, Inc, Raymond James research

Includes all trajectories

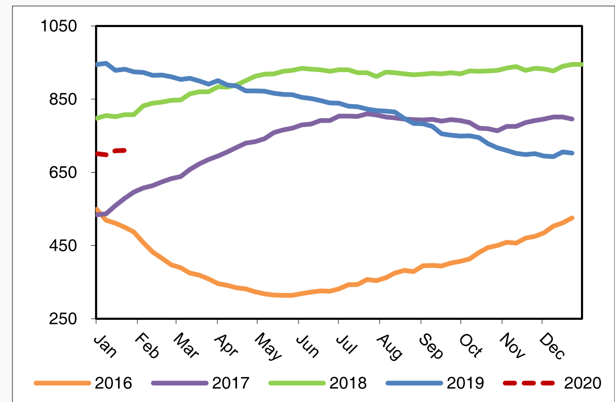
Total U.S. Rig Count



	This Week	Last Week	Beginning of Year	Last Year
Rig Count	794	796	796	1050
Percent Change		-0.3%	-0.3%	-24.4%

Source: Baker Hughes

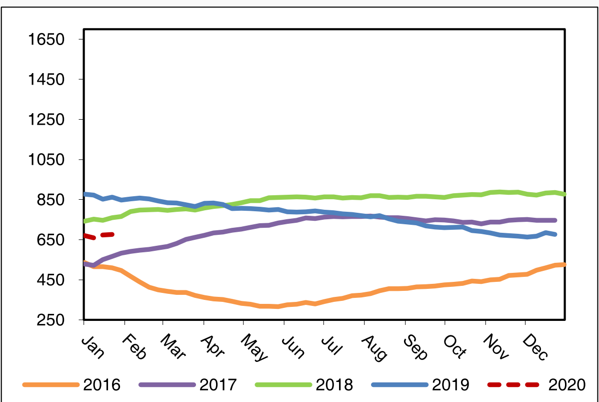
Horizontal Rig Count



	This Week	Last Week	Beginning of Year	Last Year
Rig Count	710	709	701	929
Percent Change		0.1%	1.3%	-23.6%

Source: Baker Hughes

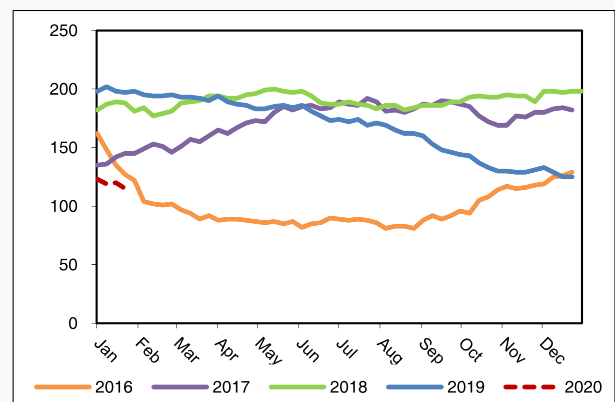
Oil Rig Count



	This Week	Last Week	Beginning of Year	Last Year
Rig Count	676	673	670	852
Percent Change		0.4%	0.9%	-20.7%

Source: Baker Hughes

Gas Rig Count



	This Week	Last Week	Beginning of Year	Last Year
Rig Count	115	120	123	198
Percent Change		-4.2%	-6.5%	-41.9%

Source: Baker Hughes

Company Citations

Company Name	Ticker	Exchange	Closing Price	RJ Rating	RJ Entity
National Oilwell Varco, Inc.	NOV	NYSE	$21.88	MO2	Raymond James & Associates
NGL Energy Partners LP	NGL	NYSE	$10.69	MO2	Raymond James & Associates
Rattler Midstream LP	RTLR	NASDAQ	$16.62	MO2	Raymond James & Associates

Prices are as of the most recent close on the indicated exchange. See Disclosure section for rating definitions. Stocks that do not trade on a U.S. national exchange may not be registered for sale in all U.S. states. NC=not covered.

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	RJA	**RJL**	**RJA**	**RJL**
Strong Buy and Outperform (Buy)	55%	61%	21%	23%
Market Perform (Hold)	41%	36%	12%	20%
Underperform (Sell)	4%	3%	8%	0%

** Columns may not add to 100% due to rounding.*

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Medium Risk/Income (M/INC) Lower to average risk equities of companies with sound financials, consistent earnings, and dividend yields above that of the S&P 500. Many securities in this category are structured with a focus on providing a consistent dividend or return of capital.

Medium Risk/Growth (M/GRW) Lower to average risk equities of companies with sound financials, consistent earnings growth, the potential for long-term price appreciation, a potential dividend yield, and/or share repurchase program.

High Risk/Income (H/INC) Medium to higher risk equities of companies that are structured with a focus on providing a meaningful dividend but may face less predictable earnings (or losses), more leveraged balance sheets, rapidly changing market dynamics, financial and competitive issues, higher price volatility (beta), and potential risk of principal. Securities of companies in this category may have a less predictable income stream from dividends or distributions of capital.

High Risk/Growth (H/GRW) Medium to higher risk equities of companies in fast growing and competitive industries, with less predictable earnings (or losses), more leveraged balance sheets, rapidly changing market dynamics, financial or legal issues, higher price volatility (beta), and potential

risk of principal.

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NGL Energy Partners LP	Raymond James & Associates received non-securities related compensation from NGL Energy Partners LP within the past 12 months.
NGL Energy Partners LP, National Oilwell Varco, Inc. and Rattler Midstream LP	Raymond James & Associates, Inc. makes a market in the shares of NGL Energy Partners LP, National Oilwell Varco, Inc. and Rattler Midstream LP.
NGL Energy Partners LP and Rattler Midstream LP	Raymond James & Associates has managed or co-managed an offering of securities for NGL Energy Partners LP and Rattler Midstream LP within the past 12 months.

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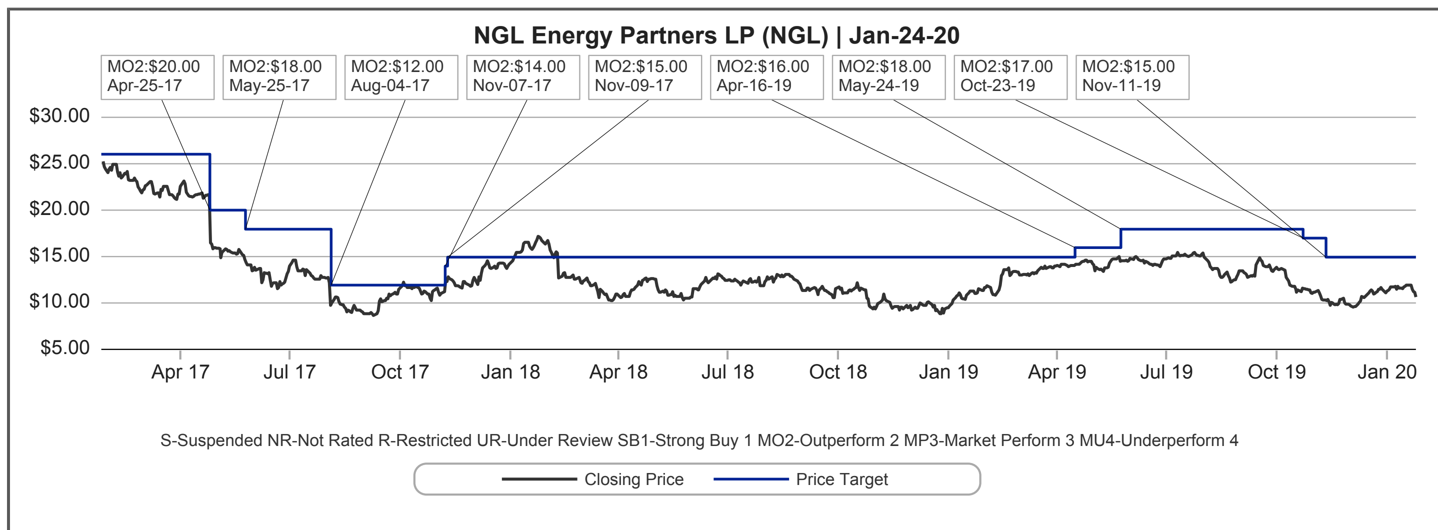
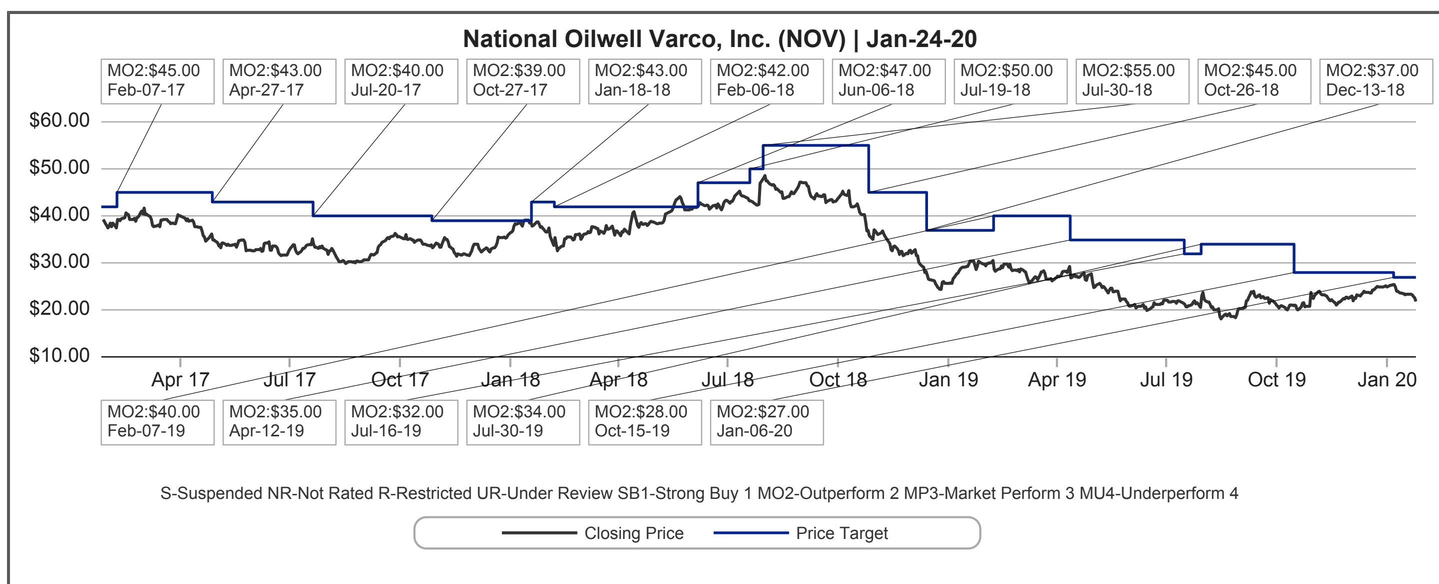
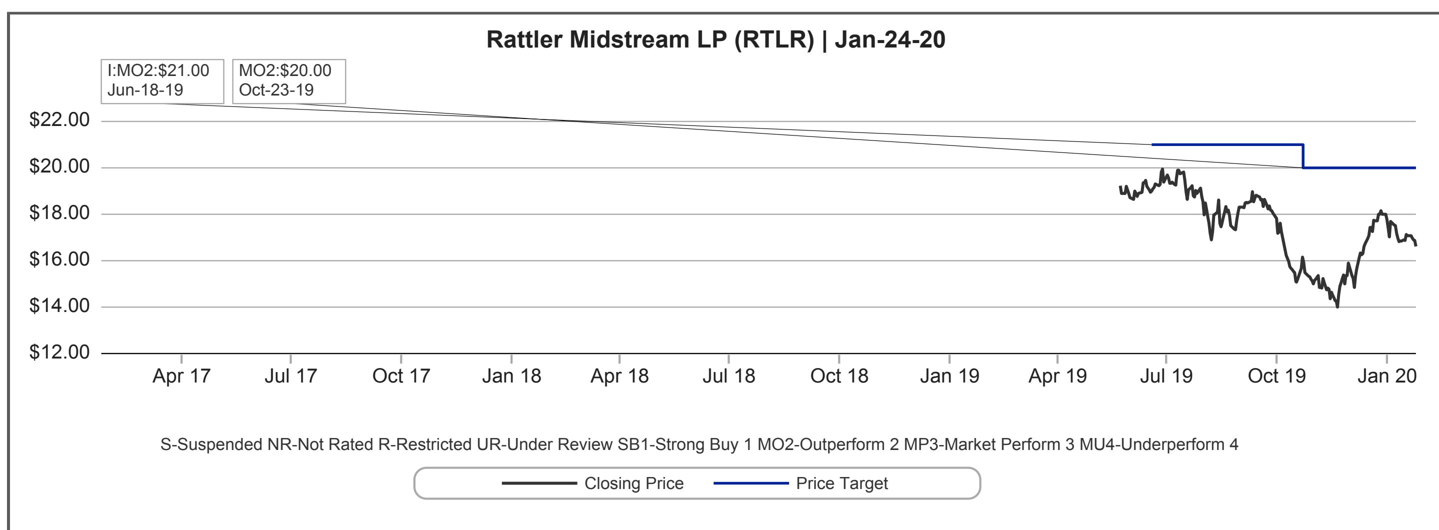
Target Prices: The information below indicates our target price and rating changes for the subject companies over the past three years.







Valuation Methodology

NGL Energy Partners LP

Our valuation methodology is based on a blended valuation comprising 1) a 10-year, three-stage distribution/dividend discount model (DDM), 2) forward price-to-distributable cash flow (P/DCF) multiples relative to comparable industry peers, and 3) forward enterprise value-to-EBITDA (EV/EBITDA) multiples relative to comparable industry peers. Our DDM assumes 1) cash distributions/dividends based on our forward-looking assumptions of the asset base, 2) a general cost of equity/discount rate/required rate of return for LP holders approximating either the capital asset pricing model (CAPM), the distribution/dividend discount model (forward yield plus growth), or the bond yield plus equity risk premium approach, and 3) a perpetual growth rate/terminal growth rate based on the growth profile of the partnership/company.

National Oilwell Varco, Inc.

Valuation Methodology: For NOV, our valuation methodology utilizes a relative EV/EBITDA multiple and also takes into consideration the company's P/E ratio in comparison to comparable P/E ratios from a peer group and its own historical trading levels.

Rattler Midstream LP

Our valuation methodology is based on a blended valuation comprising 1) a 10-year, three-stage distribution/dividend discount model (DDM), 2) forward price-to-distributable cash flow (P/DCF) multiples relative to comparable industry peers, and 3) forward enterprise value-to-EBITDA (EV/EBITDA) multiples relative to comparable industry peers. Our DDM assumes 1) cash distributions/dividends based on our forward-looking assumptions of the asset base, 2) a general cost of equity/discount rate/required rate of return for LP holders approximating either the capital

asset pricing model (CAPM), the distribution/dividend discount model (forward yield plus growth), or the bond yield plus equity risk premium approach, and 3) a perpetual growth rate/terminal growth rate based on the growth profile of the partnership/company.

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Company-Specific Risks

NGL Energy Partners LP

Inability to Remove the General Partner
Consistent with the MLP structure, Class A common unitholders are not entitled to elect the partnership's general partner or the general partner's directors. Even if unitholders are dissatisfied, they cannot remove the general partner except in rare circumstances. Given that a majority of holders vote to remove the general partner, they would also have the right to elect a successor general partner.

Counterparty Risk
NGL Energy Partners relies on third parties for services, product, and demand. As a result, the partnership could be impacted in a number of ways by counterparty risk. NGL Energy's business would be adversely affected if the operations of its refinery, producer, or other customers experienced significant interruption. In addition, the partnership relies on third parties for pipeline, truck, rail, and barge transportation services in its crude oil logistics segment. In its natural gas liquids logistics segment, the partnership relies on third-party operators for several of its NGL terminals. While NGL Energy mitigates its commodity exposure through its: 1) back-to-back purchase and sale structure of crude oil and NGLs in these two logistics businesses; and 2) fee-based contracts (some with acreage dedications or volume commitments) in the Water Services segment, commodity price volatility could have an adverse effect on profits and cash flow. In its Retail Propane segment, the volatility in commodity prices could have an adverse effect on propane margins. Given that price is a natural response to demand, materially lower prices could affect throughput volumes in all four of NGL Energy's segments. Despite structural measures that help create a "fixed" margin mechanism in its Crude and NGL Logistics segments, in some cases, price volatility may also impact margins. Separately, there is no guarantee concerning the future activities of the partnership. NGL Energy could purchase assets with greater commodity exposure to fluctuations in commodity prices.

Acquisition/Integration Risk
While acquisitions are a critical component of the partnership's growth strategy, NGL Energy Partners may be unable to make such acquisitions under accretive terms and/or obtain the necessary financing to fund these acquisitions. Even if such an acquisition is completed, the risk that it will be unsuccessful still exists due to integration risk, overpayment risk, environmental liabilities, and the risk of asset underperformance following the acquisition. These risks could impair NGL Energy's ability to grow cash distributions.

Interest Rate Risk
Interest rate movements can impact yield-oriented investments such as MLPs. Increasing interest rates could have an adverse effect on NGL Energy's unit price if alternative yield-oriented investments become more attractive. Rising interest rates could also increase the partnership's financing costs, thereby reducing the amount of cash flow available for distribution to common unitholders. It is worth noting that NGL Energy has particular exposure to interest rate volatility given that interest on its credit facility is set by a variable rate.

Dependence on Capital Markets
MLPs pay out a significant portion of available cash in the form of distributions to unitholders. When growth projects/acquisitions become available, partnerships typically access the capital markets for the necessary funds to finance this growth. Market conditions may or may not be attractive for NGL Energy at the time it seeks external funding, which may result in higher capital costs, lower returns, and in some instances, the inability to fund growth.

Distributions Are Not Guaranteed
The actual amount of cash distributed to NGL Energy unitholders may fluctuate and will depend on NGL Energy's ability to capture consistent margins in its four business segments. The partnership's ability to maintain adequate and stable coverage can fluctuate from quarter to quarter depending on the volumes and prices at which the partnership buys and sells its products, demand for its services, its ability to maintain steady operating costs, working capital changes, and macroeconomic and sociopolitical factors.

Competition Risk
NGL Energy competes with other gatherers, transporters, marketers, brokers, and aggregators, including refiners, independents, and major integrated companies as well as their marketing affiliates, which may have greater capital resources and/or a larger supply of crude oil and NGLs.

Its ability to compete could be harmed by a competitor's construction of new assets or redeployment of existing assets so as to capture market share, the perception that competitors offer better service, and the availability of alternative supply located closer to customers. Moreover, while the partnership intends to grow its business by identifying organic and inorganic opportunities, there is no guarantee that the partnership will be successful at securing such growth. Any of these factors could result in customers utilizing the assets and services of competitors or price degradation, either of which could impact operating results, financial position, cash flow, and coverage.

Terrorism

Pipelines and other midstream energy assets could be targets of terrorist activities. NGL Energy may be subject to an elevated risk of terrorism. There is no guarantee that insurance to protect against these events will be available at reasonable rates in the future. The partnership may also face rising compliance costs to adhere to new government-imposed security measures.

Regulatory Risk

The ownership, operation, and development of midstream energy assets involve numerous regulatory, environmental, political, and legal uncertainties that are outside of NGL Energy's control. Environmental laws and regulations have recently raised operating costs for the oil and refined products industry. Compliance with such laws and regulations may cause the partnership to incur higher integrity and maintenance costs in the future.

National Oilwell Varco, Inc.

International Exposure Poses Potential Risk National-Oilwell has been expanding its international presence to take advantage of opportunities that have arisen worldwide. National- Oilwell conducts business in the Middle East, Africa, Southeast Asia, South America, and other international markets. This expansion exposes National-Oilwell to a certain degree of risk associated with international operations. Such risks include potentially volatile political climates, exchange rate fluctuations, import-export quotas, and other forms of governmental regulation. While National-Oilwell has taken measures to ease this risk, it is a possibility that foreign government interruptions for oil and gas-related activity could occur, hindering operations in such areas. As international expansion continues to grow, the exposure to such risks will also increase.

Projected Cost Savings From Acquisitions Could Be Insufficient National Oilwell Varco has made several acquisitions over the past few years to increase market share and enhance product offerings. Factors could arise in the marketplace that would prevent National Oilwell from realizing anticipated synergies and hinder its ability to integrate acquisitions into the overall business model. Combining organizations could have a negative impact on operations by interrupting the activities or businesses of National Oilwell Varco.

Impact of Volatile Commodities National-Oilwell Varco's business primarily is dependent on the state of the oil and gas industry and capital expenditures for exploration, production, and transmission activities. The amount oil and gas operators allocate for capital expenditures generally depends on oil and gas prices. While we believe that the supply/demand fundamentals suggest a rebound in commodity prices, investors should be aware oil and natural gas prices tend to be volatile and the near-term outlook suggests continued lower oil prices. Furthermore, a sustained downturn in either U.S. natural gas prices or worldwide oil prices would undoubtedly lead to lower levels of oilfield activity continuingbeyond what we are currently experiencing

High-Risk Suitability Rating

We assign a High Risk suitability rating to NOV shares based on the highly cyclical nature of commodity prices, which can cause shares to meaningfully underperform the broader market during times of commodity market distress. Such cycles can be brought on by factors including, but not limited to, geopolitical issues, supply disruptions, economic slowdown, and/or periods of over-investment.

Rattler Midstream LP

The amount of cash Rattler Midstream LP distributes to its unitholders depends principally upon the cash generated from operations. Since the cash generated from operations will fluctuate from quarter to quarter, Rattler Midstream LP may not be able to maintain future quarterly distributions at the current level. Rattler's ability to pay quarterly distributions depends primarily on cash flow, including cash flow from financial reserves and working capital borrowings, and not solely on profitability, which is affected by non-cash items. As a result, Rattler Midstream LP may pay cash distributions during periods when it records net losses and may be unable to pay cash distributions during periods when it records net income.

Rattler Midstream LP is subject to risks associated with nonpayment or nonperformance by customers to which Rattler Midstream LP provides services and sells commodities. With one predominant customer upon its IPO, Rattler operates at a substantial customer concentration risk. Further, some of Rattler's future customers may be highly leveraged or under-capitalized and subject to their own operating and regulatory risk; these customers could have increased risk that could result in default on their obligations to Rattler Midstream LP.

While acquisitions are not a primary component of the company's growth strategy, Rattler Midstream LP may be unable to make such acquisitions under accretive terms and/or obtain the necessary financing to fund these acquisitions. Even if such an acquisition is completed, the risk that it will be unsuccessful still exists due to integration risk, overpayment risk, environmental liabilities, and the risk of asset underperformance following the acquisition. These risks could impair Rattler's ability to make cash distributions. Management attempts to minimize these risks by performing extensive due diligence.

Interest rate movements can affect yield-based investments, such as Rattler Midstream LP. Increasing interest rates could have an adverse effect on Rattler's share price as alternative yield investments, such as U.S. Treasuries, become more attractive. In addition, increased debt service cost and interest expense might negatively affect the partnership's distributable cash flow.

Midstream companies pay out a significant portion of available cash in the form of distributions to shareholders. When growth projects/ acquisitions become available, companies typically tap the capital markets for the necessary financing to fund such projects. Market conditions may or may not be attractive for Rattler Midstream LP at the time it needs external funding.

Although very limited, RTLR's operations or margins could eventually be exposed to volatility in commodity prices indirectly through its volume exposure to Diamondback (FANG). While a midstream company's revenues are typically generated primarily by tolling fees, margin-based businesses can be directly and/or indirectly impacted by increases or decreases in commodity prices. This technically results in some indirect exposure at the Rattler level.

High Risk/Income Suitability rating: While RTLR is largely insulated from direct exposure to commodity prices, it does have indirect exposure to commodity prices given its dependence on volume growth in the Permian. Additionally, Rattler lacks customer diversity as the entirety of the partnership's earnings relies on volumes from FANG. Although we regard Diamondback as a strong E&P and strong sponsor, we have to acknowledge that RTLR would benefit from a more varied customer base. Given the partnership's indirect exposure to commodity pricing and dependence on FANG, we view a high risk/income suitability rating as appropriate.

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