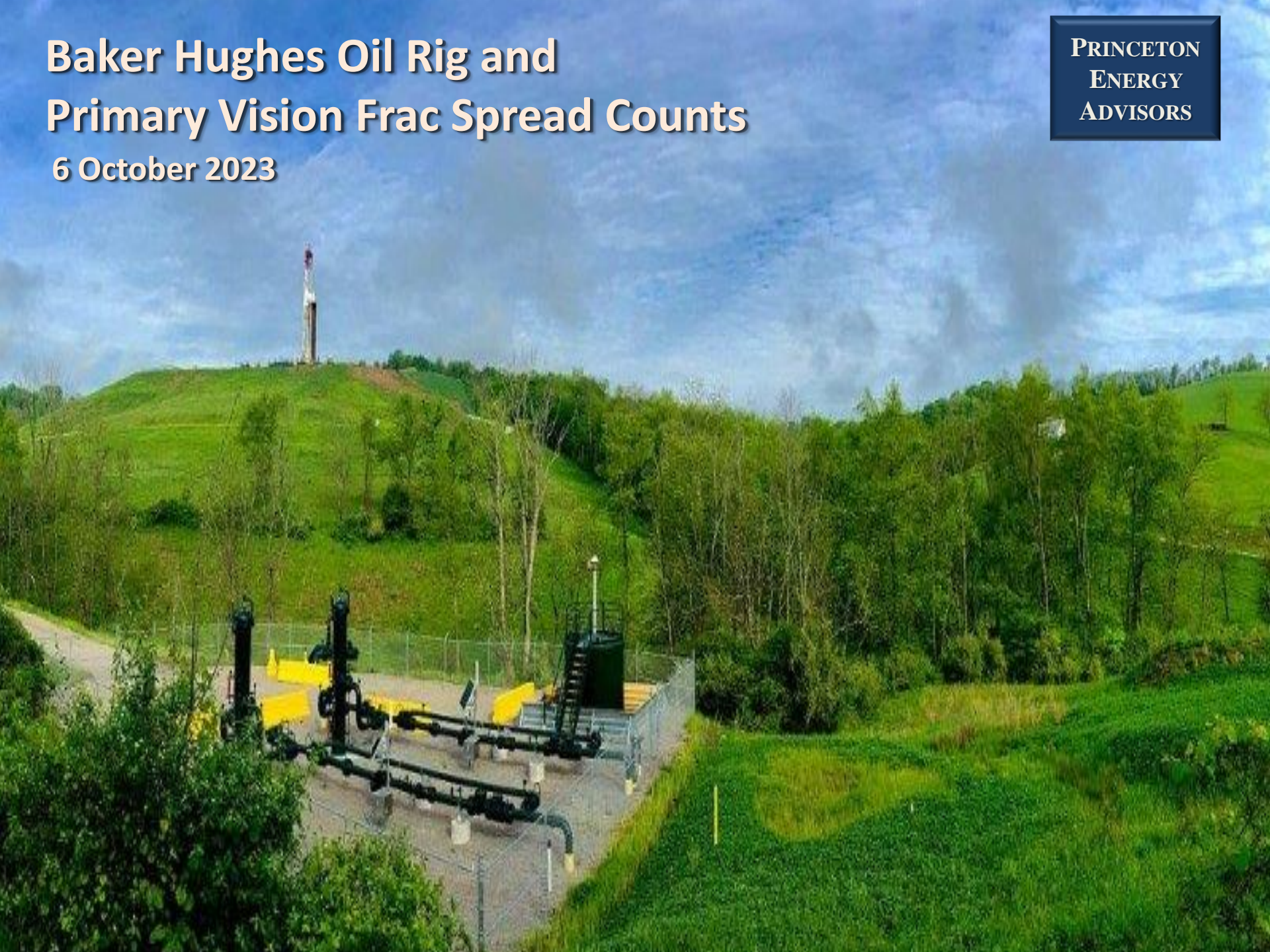


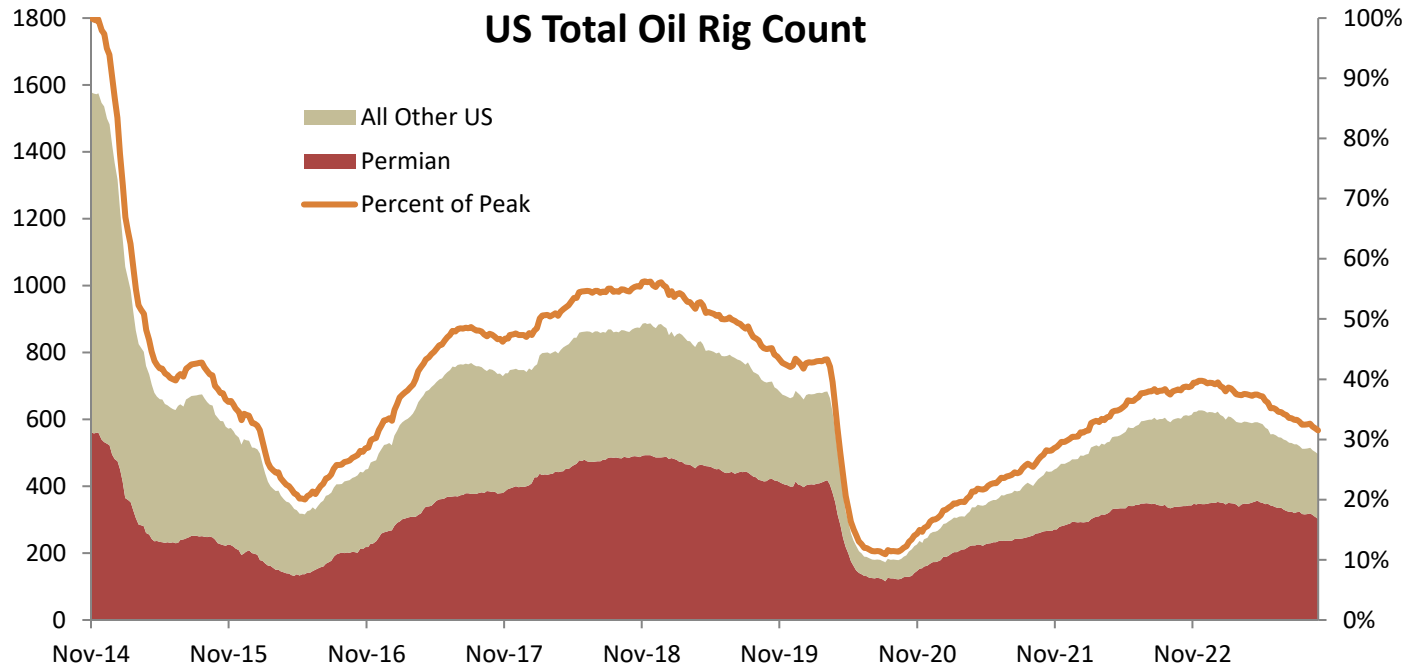
Baker Hughes Oil Rig and Primary Vision Frac Spread Counts

6 October 2023

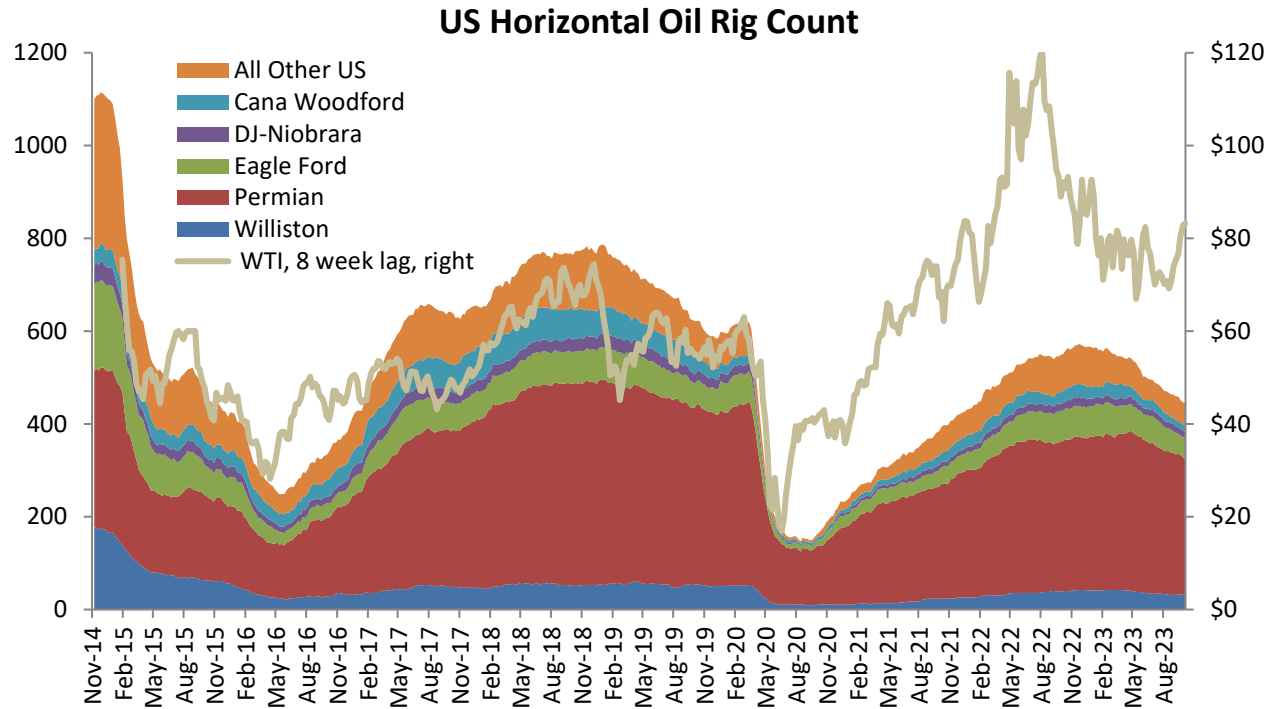
PRINCETON
ENERGY
ADVISORS



- The Permian led rig declines this week.
- Rig counts
 - Total oil rig counts: -5 to 497
 - Horizontal oil rig counts: -2 to 445
 - The Permian horizontal oil rig count: -2
 - The Canadian horizontal oil rig count had a bad week, down 8 to 106 and 33 below last year for the week
- The US horizontal oil rig count is falling at a pace of -3.5 / week on a 4 wma basis.
 - This number has been negative for 44 of the last 45 weeks
- Frac spreads rose, +5 to 260
 - As earlier, this is still too high for the current rig count, as DUCs continue to fall.
 - To hold DUCs steady, the spread count must fall by 26
- Exxon is reportedly [making an offer](#) for Pioneer
 - The absorption of Pioneer into an established player like Exxon would once again mark the end of the shale revolution

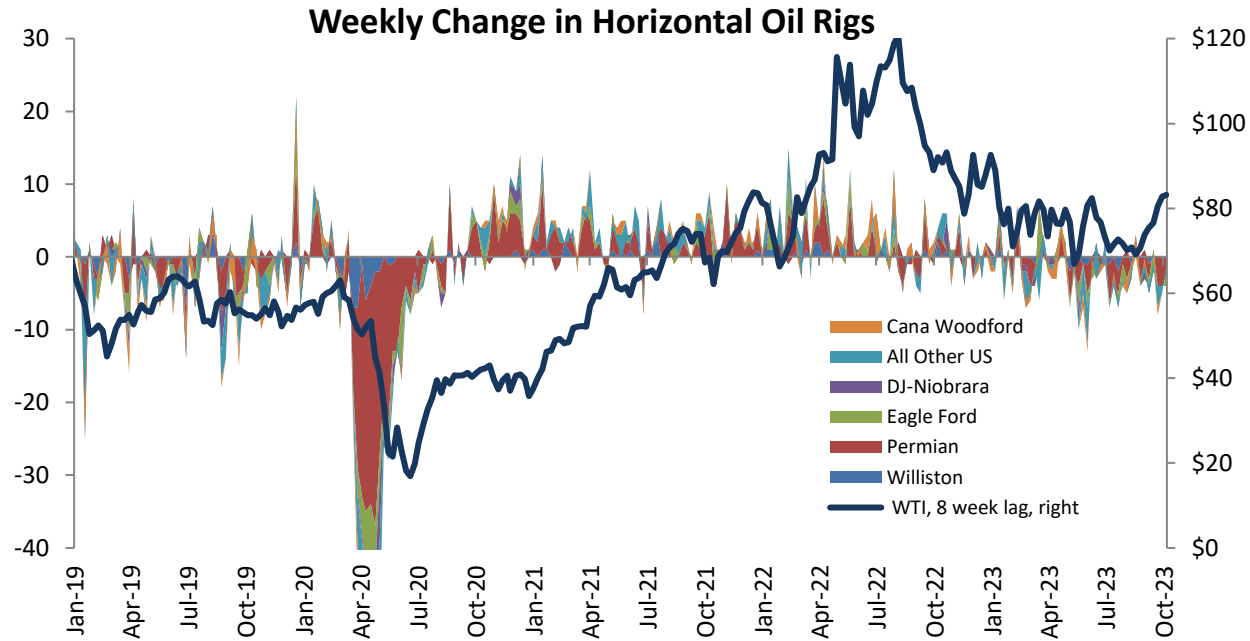


- Total oil rigs: -5 to 497
- Permian: -6
- All Other US: +1



- Horizontal oil rigs: -2 to 445
- Permian: -4
- All Other US: +2

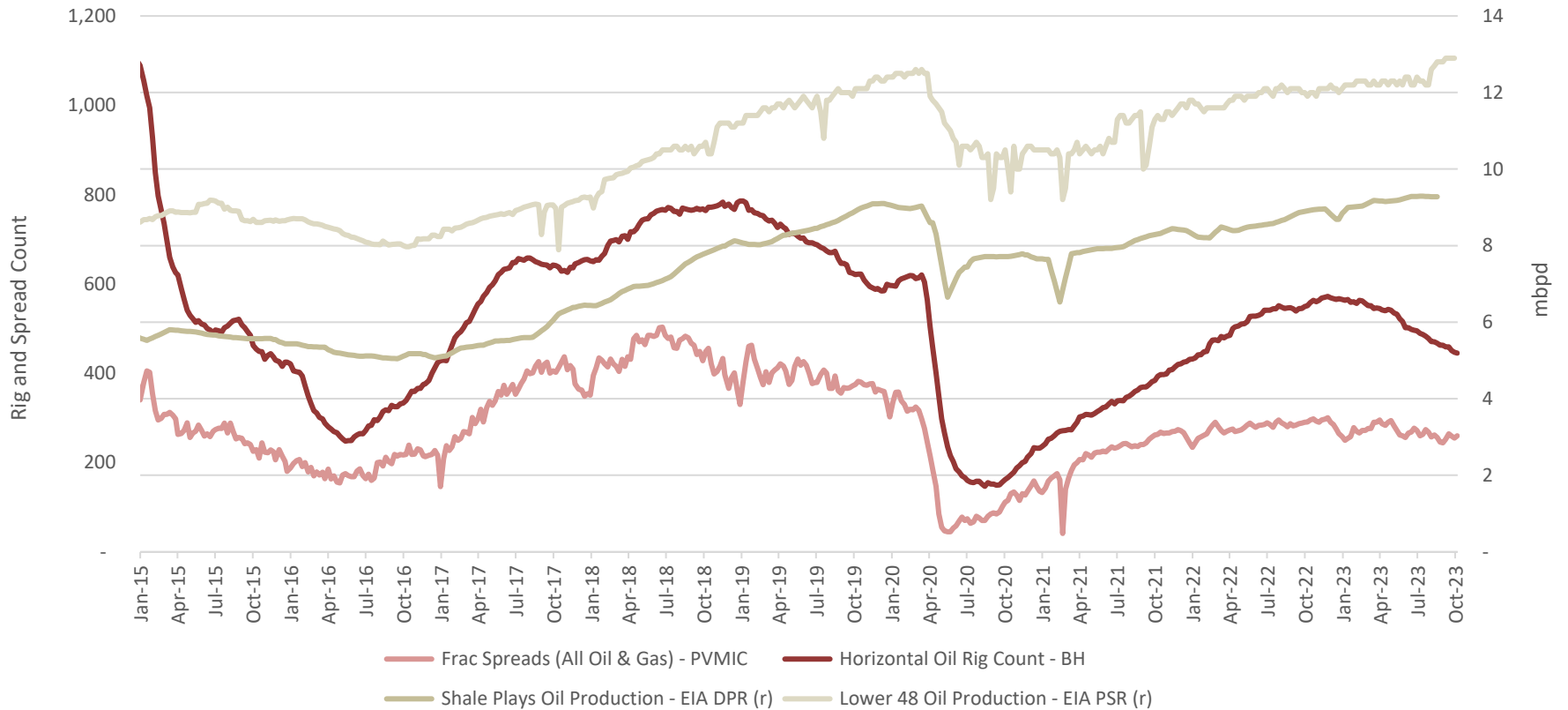
Weekly Change in Horizontal Oil Rig Count by Basin



• By Basin	Change	Count
- Williston	-1	32
- Permian	-4	292
- Eagle Ford	+2	45
- DJ Niobrara	0	14
- Cana Wdford	0	13
- Other US	+1	49
- Total	-2	445

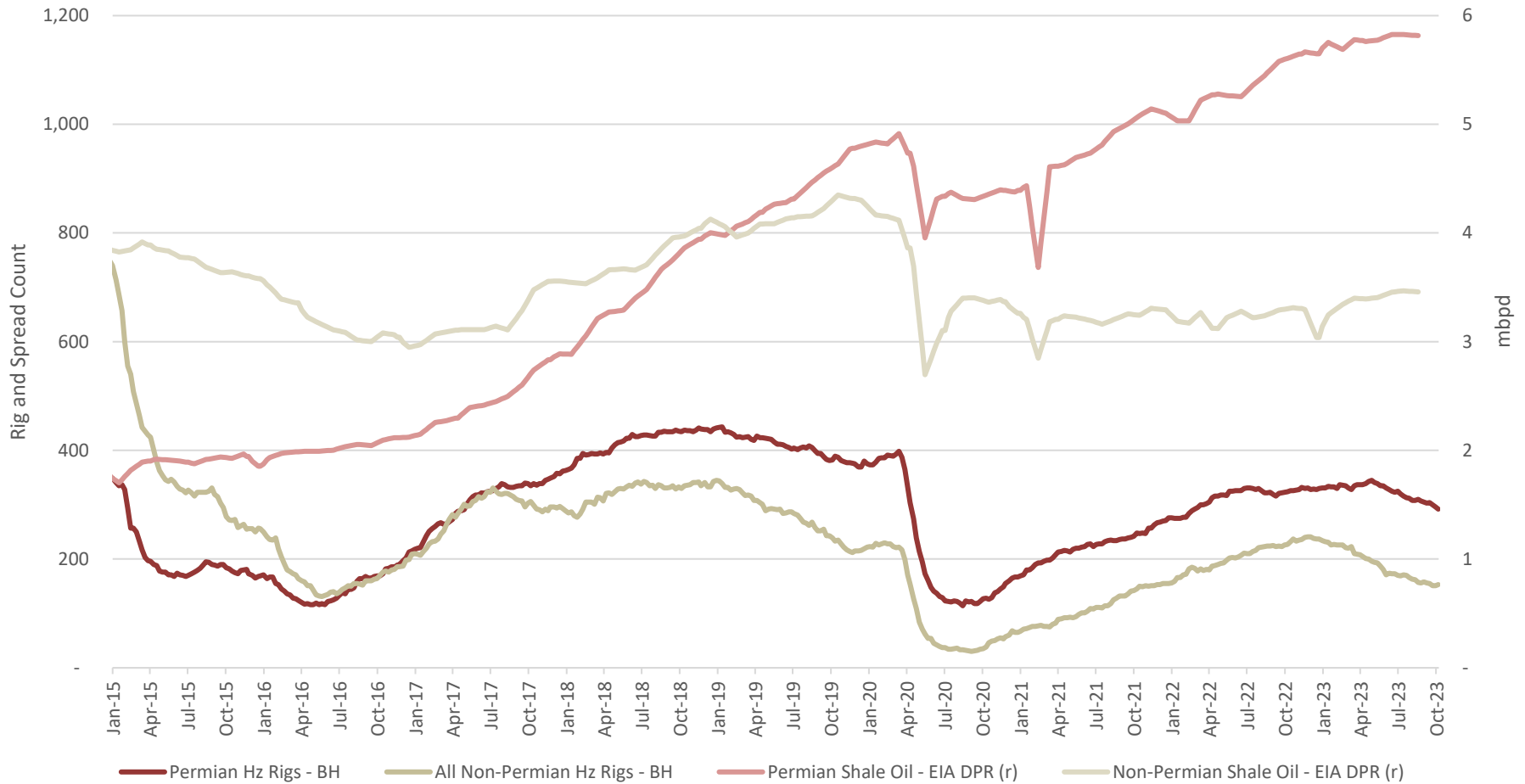
Rigs, Spreads and US Oil Production

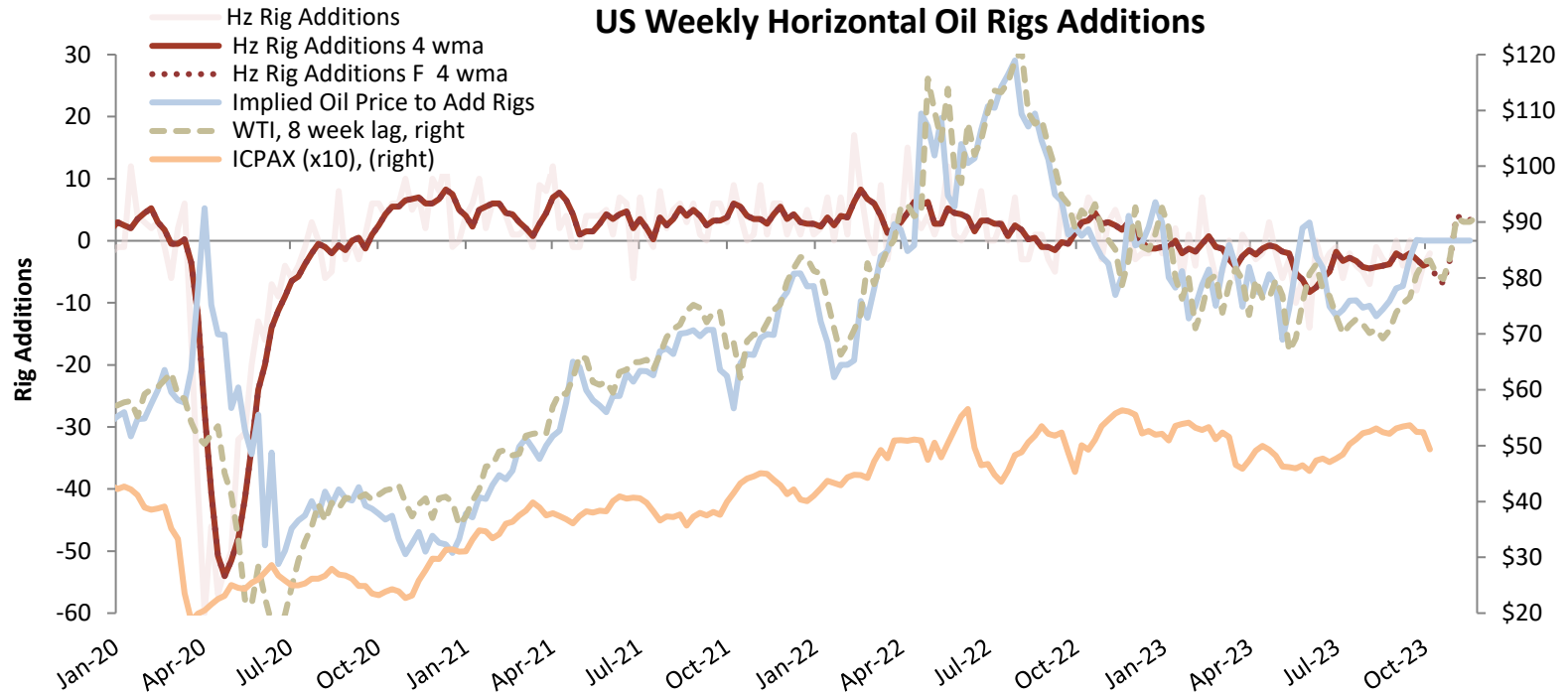
Rigs, Spreads and US Crude and Condensate Production



Permian & Non-Permian Shale Oil Production and Hz Oil Rigs

Permian and Non-Permian Shale Oil Production and Horizontal Rigs

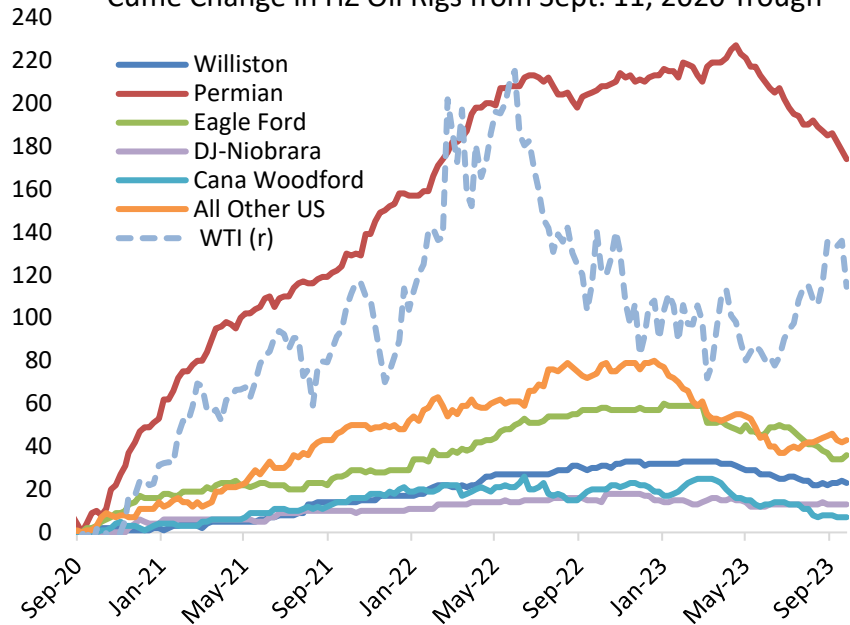




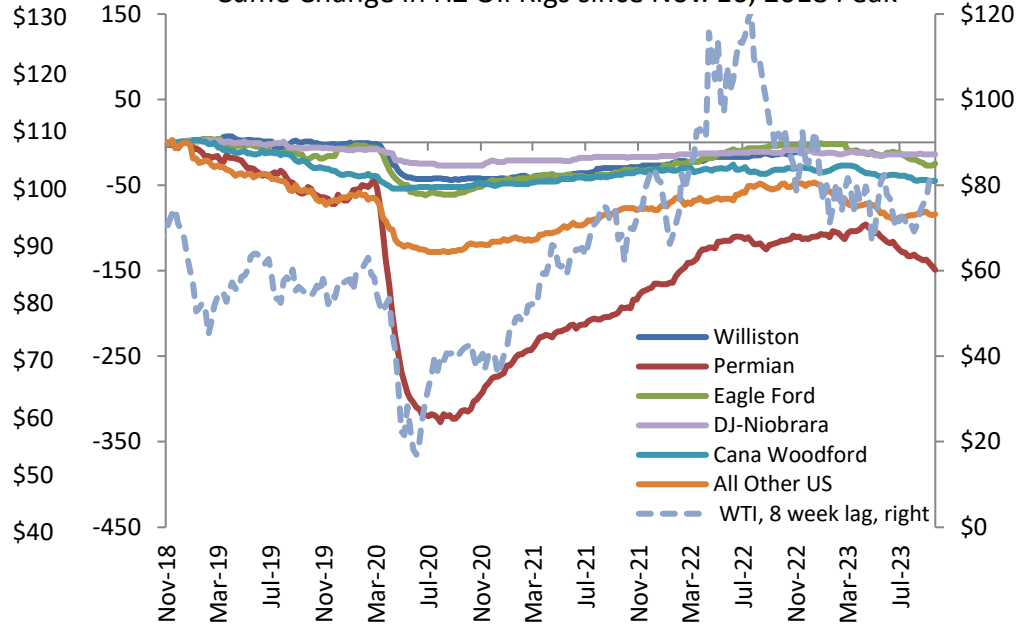
- The 4 wma pace of horizontal rig additions rose to -3.5 / week, negative for the 44th time in the last 45 weeks
- With an eight-week lag, the breakeven to add horizontal oil rigs remained at \$86 / barrel on a WTI basis with \$83 on the screen

US Horizontal Oil Rig Change from Peak and Trough

Cume Change in HZ Oil Rigs from Sept. 11, 2020 Trough

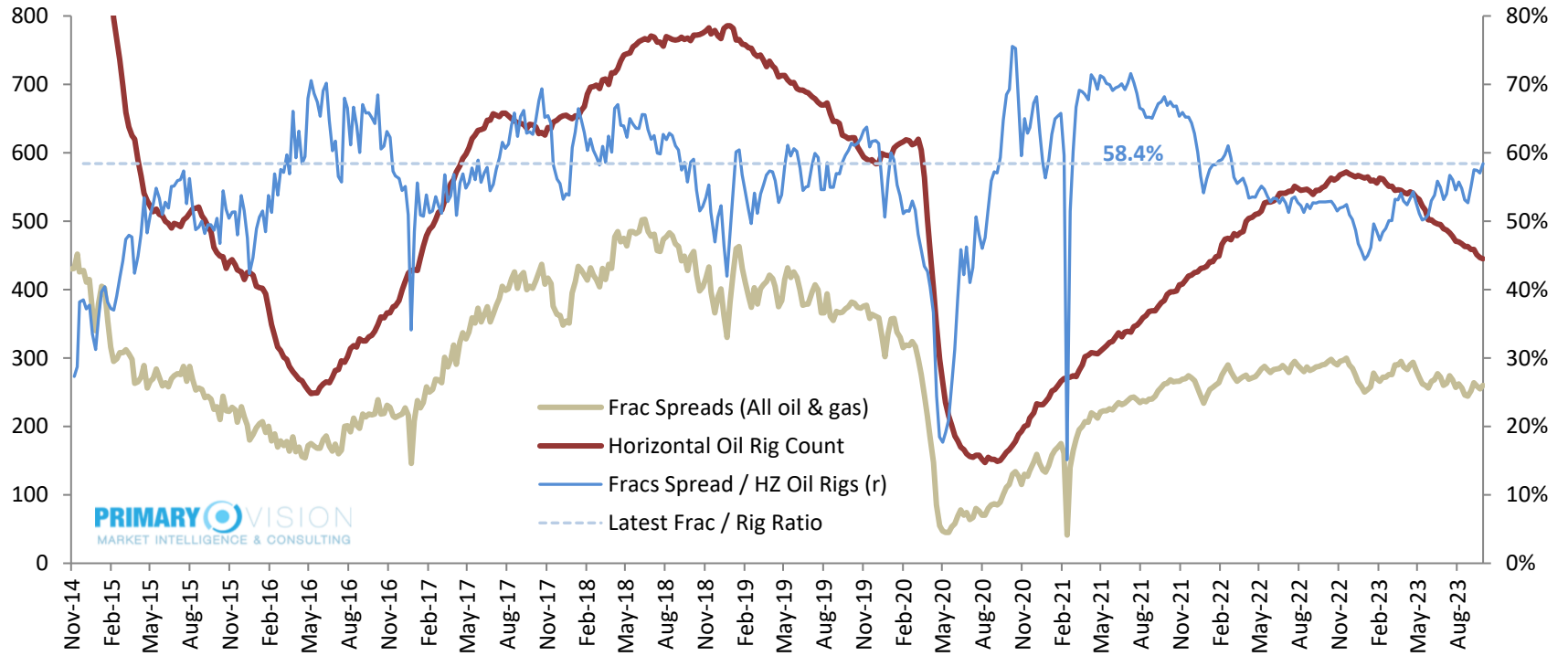


Cume Change in HZ Oil Rigs since Nov. 16, 2018 Peak



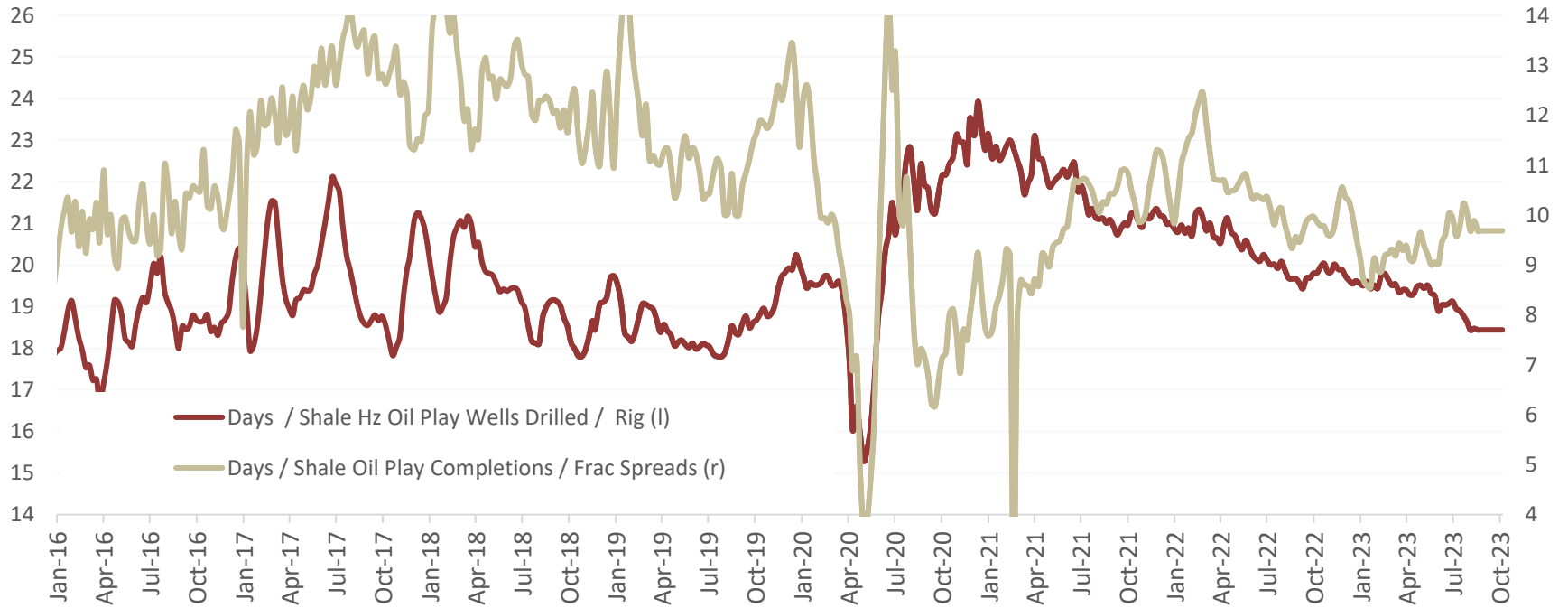
	Latest HZ Rig Count	Trough August 14, 2020			Prior Peak Nov. 16, 2018				
		Trough Count	Rig Change	Percent Change	Pct of Rig Gained	Peak Count	Rig Change	Percent Change	Pct of Rigs Lost
- Williston	32	11	21	191%	7%	53	(21)	-40%	6%
- Permian	292	114	178	156%	60%	441	(149)	-34%	44%
- Eagle Ford	45	10	35	350%	12%	70	(25)	-36%	7%
- DJ Niobrara	14	1	13	1300%	4%	28	(14)	-50%	4%
- Cana Wdford	13	6	7	117%	2%	58	(45)	-78%	13%
- Other US	49	5	44	880%	15%	133	(84)	-63%	25%
- Total	445	147	298	203%	100%	783	(338)	-43%	100%
		<i>05/22/20</i>							
- Frac Spreads	260	45	215	478%		433	(173)	-40%	
<i>Spread Ratio</i>	<i>58.4%</i>	<i>30.6%</i>				<i>55.3%</i>			

Frac Spreads and Horizontal Oil Rigs



- Frac spreads were -4 to 255

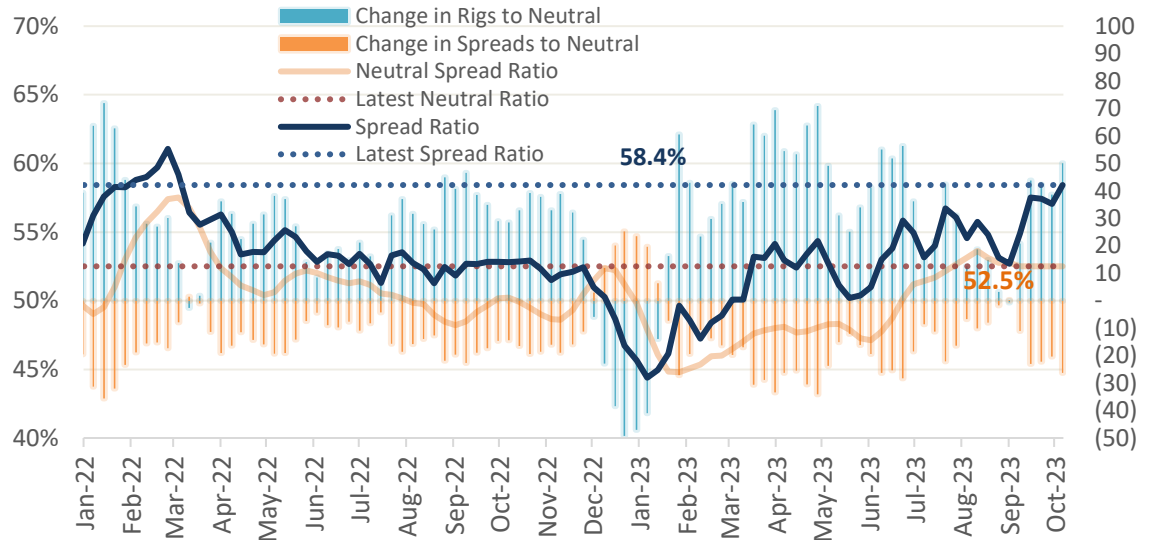
Productivity of Rigs and Spreads: Days per Well



Rig and Spread Productivity

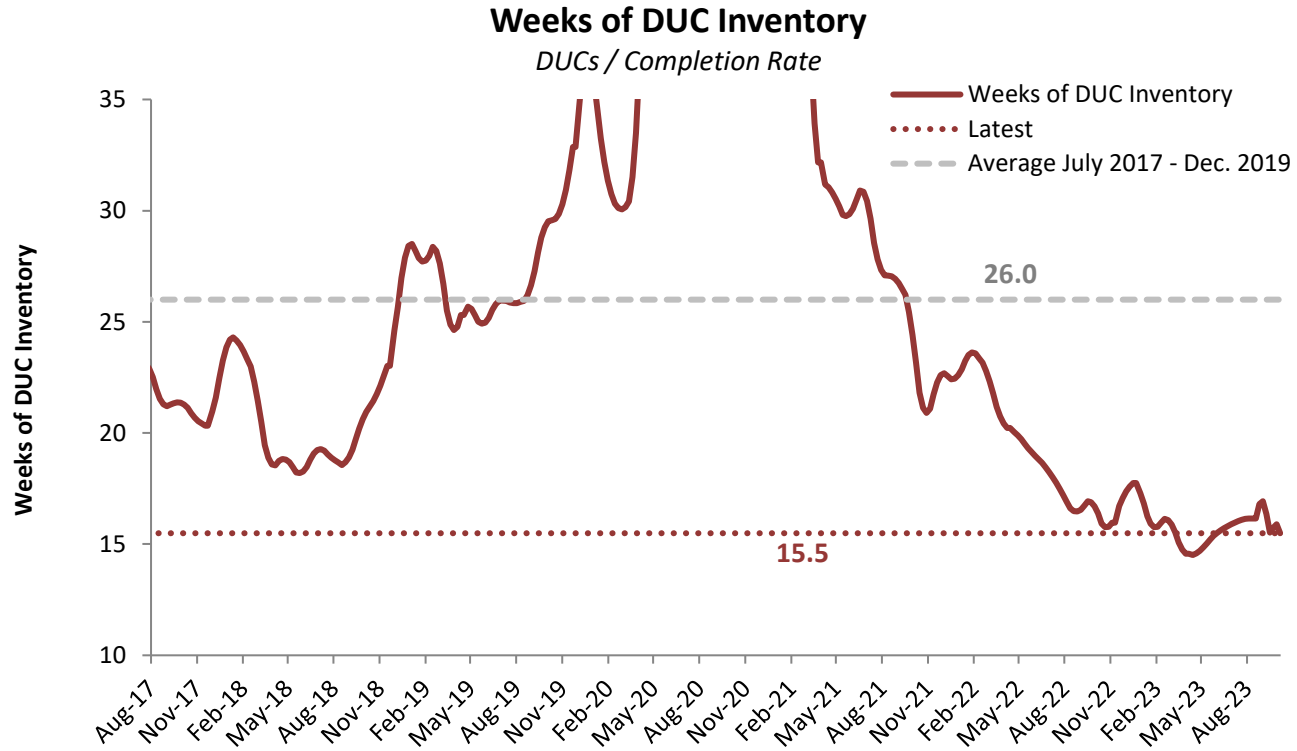
- At estimated productivity levels and current rig and spread counts, the DUC inventory is declining

The Spread Ratio and Rigs and Spreads for DUC Neutrality



Horizontal Oil Wells Drilled and Completed per Week

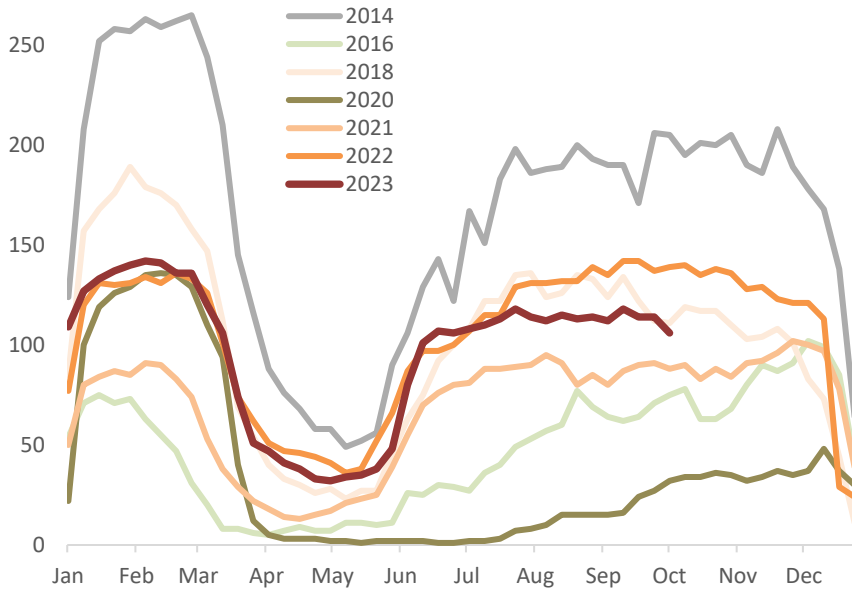




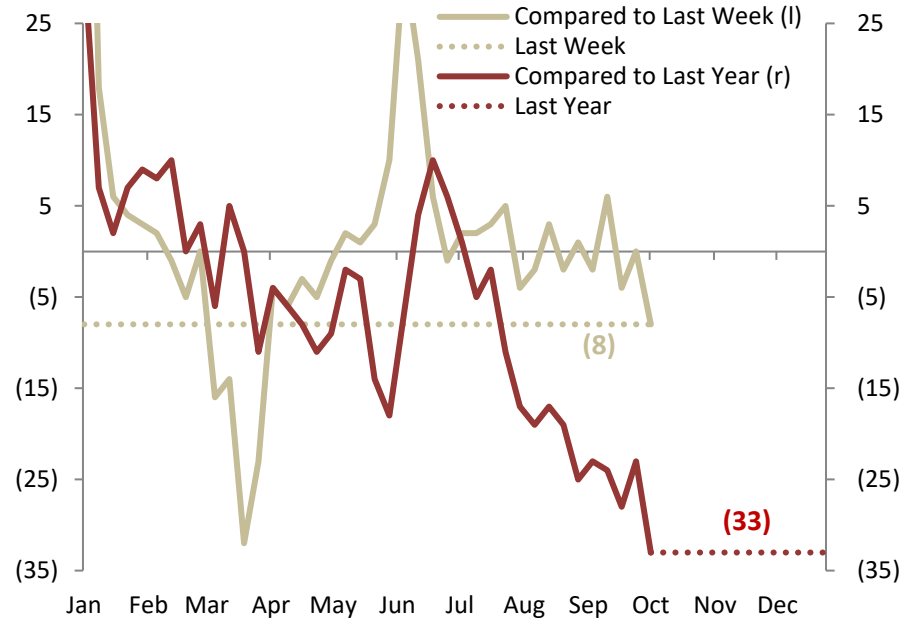
- DUC inventories have fallen back to below 16 weeks

Canada Horizontal Oil Rig Count

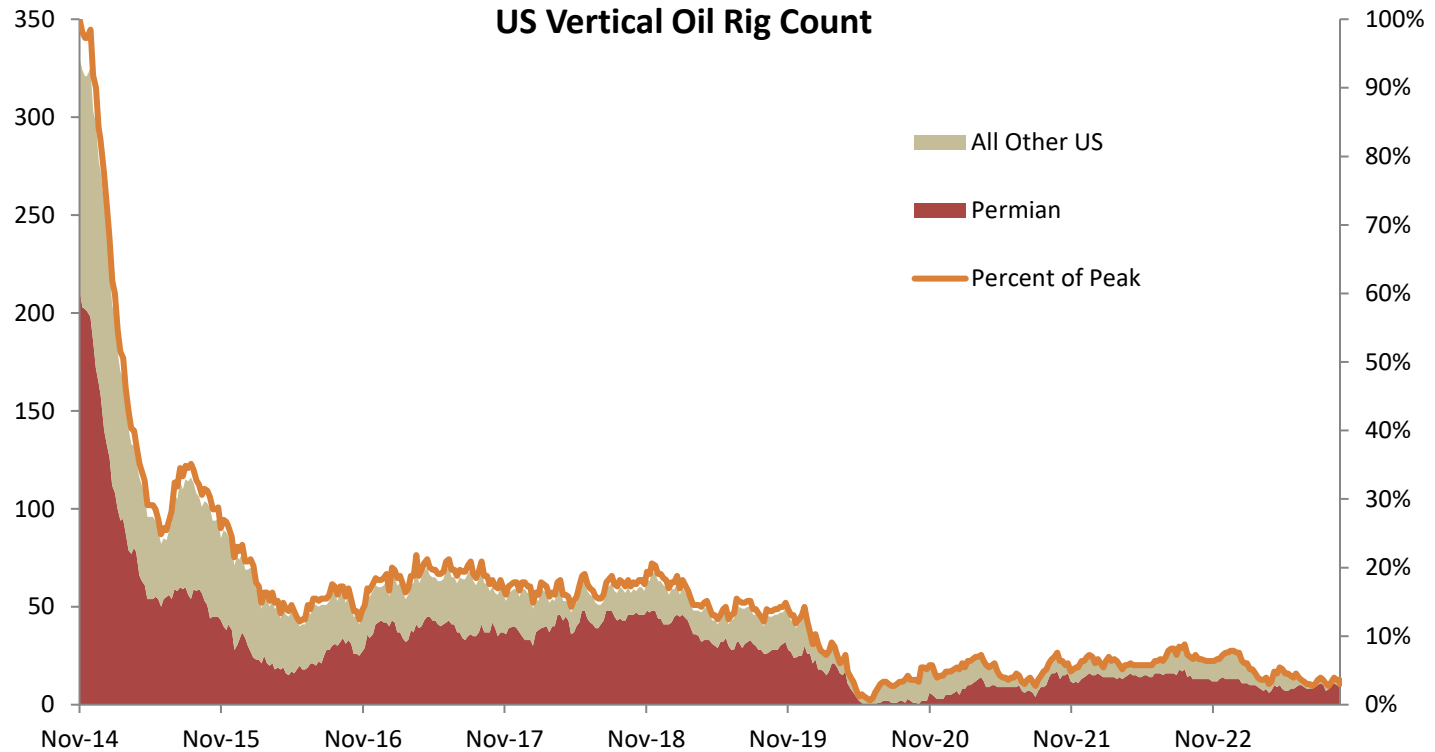
Canada Horizontal Oil Rigs



Compared to Previous Week, Previous Year

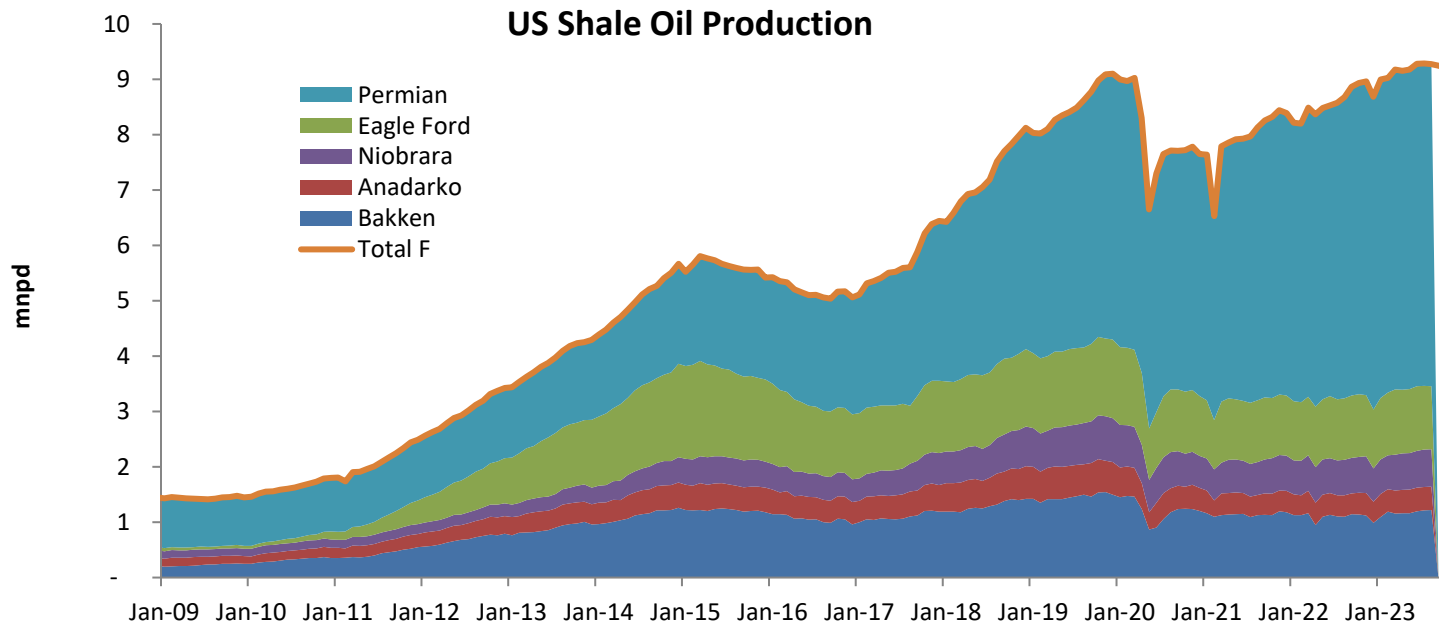


- Canada horizontal oil rigs were -8 to 106 last week
- Rigs counts were -33 compared to the same week last year



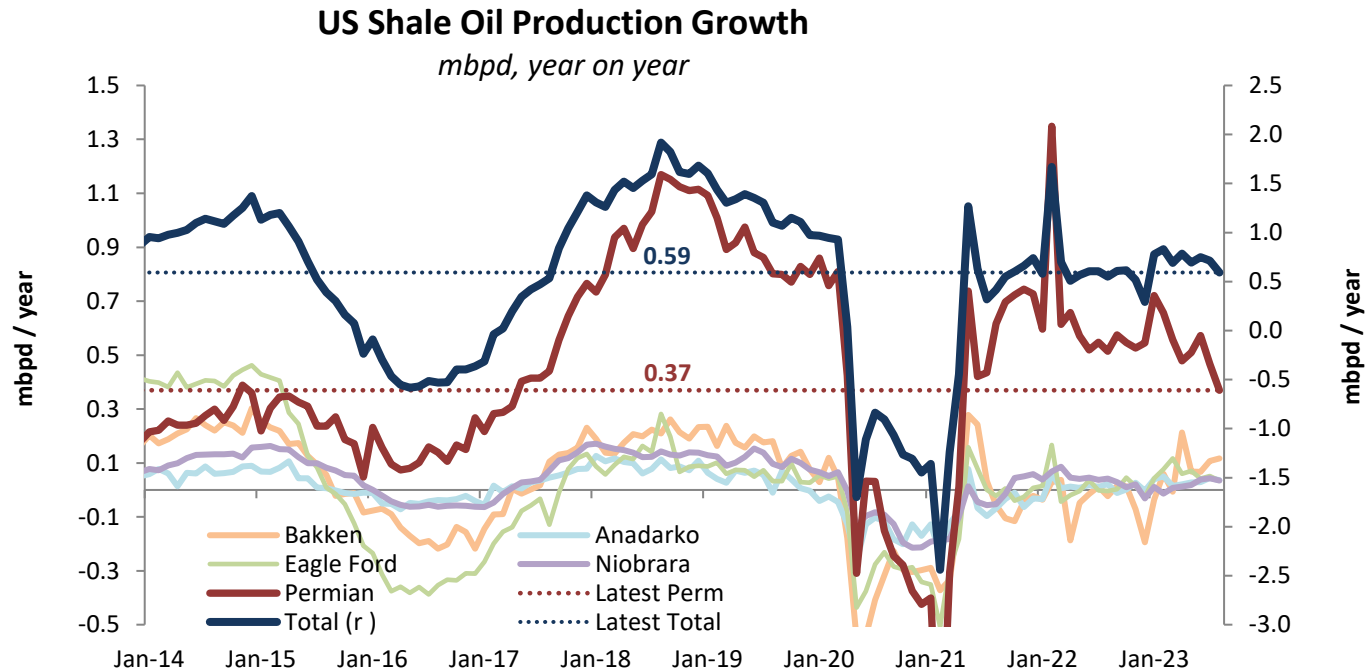
- Horizontal oil rigs: -2 to 445
- Permian: -4
- All Other US: +2

US Shale Production Growth (Sept. DPR)



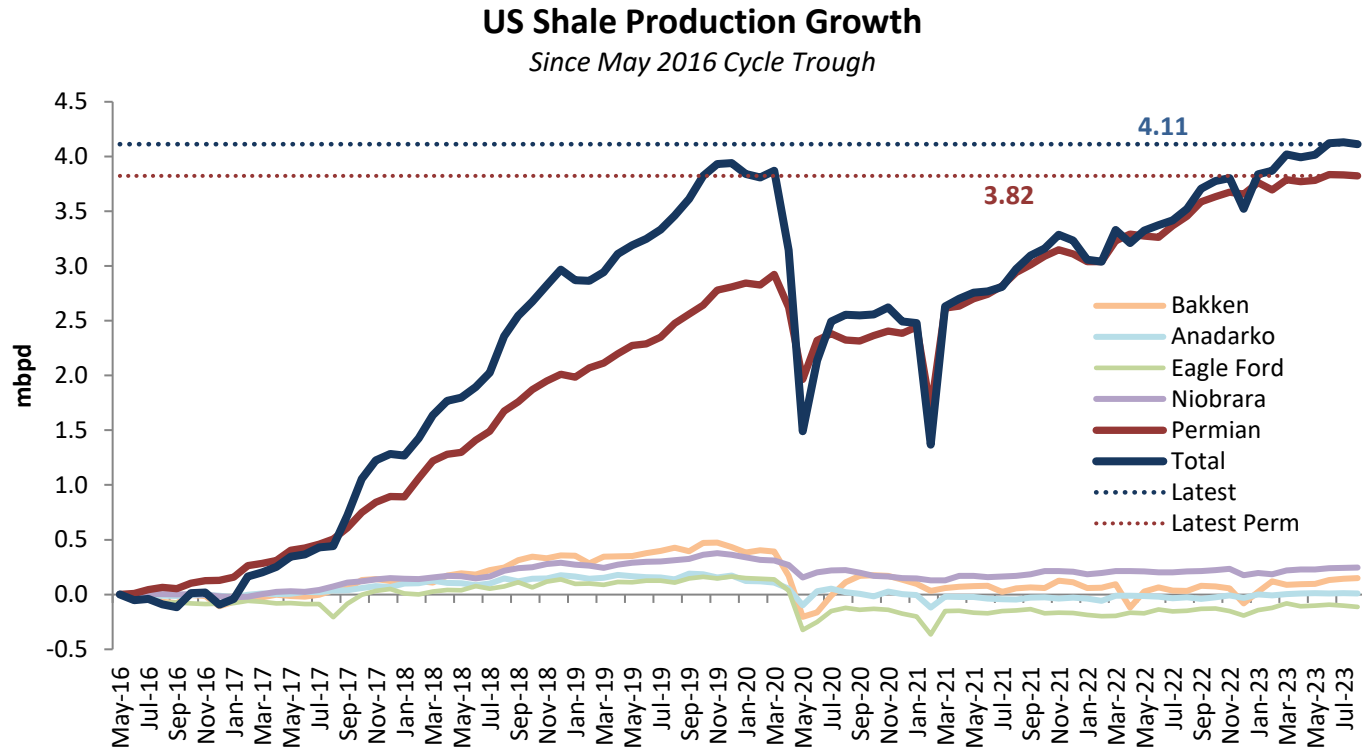
- In the September DPR report, August crude and condensate production from key shale plays rose to 9.73 mbpd, down 17 kbpd from July. However, total July C+C production was revised up 36 kbpd from 9.25 mbpd
- Permian production again fell in August, down a 9 kbpd over July
- The minor plays are down marginally over the period
- The EIA is forecasting Oct. C+C production down 82 kbpd from its July peak for the key US shale plays

US Shale Production Growth (Sept. DPR)



- Compared to last year, total shale oil production is up 0.6 mbpd
- The Permian is up 0.4 mbpd
- Annual Permian growth is rapidly decelerating

US Shale Production Growth from May '16 (Sept. DPR)



- Since the prior cyclical trough in May 2016, total shale oil production from the key plays is up 4.1 mbpd
- All but 290,000 bpd of this growth comes from the Permian basin

