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He began his career on the buy-side as a Quantitative Research Analyst at BlackRock and Weiss, Peck & Greer. Tim has been a frequent guest on CNBC, Bloomberg, and Fox News, and quoted in The Wall Street Journal and other outlets.

Tim holds a BBA in finance and a BA in Spanish from the College of William & Mary, and an MBA from NYU Stern. A CFA charterholder, he also holds Series 7, 63, 86, and 87 licenses. He works in the Denver metro area.



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Ryder Scott 21st Annual Reserves Conference:

U.S. Shale Oil Degradation and the Pivot to Tier 2 Inventory

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Oil Macro Backdrop

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Degradation Trends in U.S. Shale

What Hunter S. Thompson taught me about the current state of oil shale

“We had all the momentum. We were riding the crest of a high and beautiful wave. So now, less than five years later, you can go up on a steep hill in [Midland, TX], and with the right kind of eyes, you can almost see the high-water mark, that place where the wave finally broke and rolled back.”

- Hunter S. Thompson, *Fear and Loathing in Las Vegas* (1971)

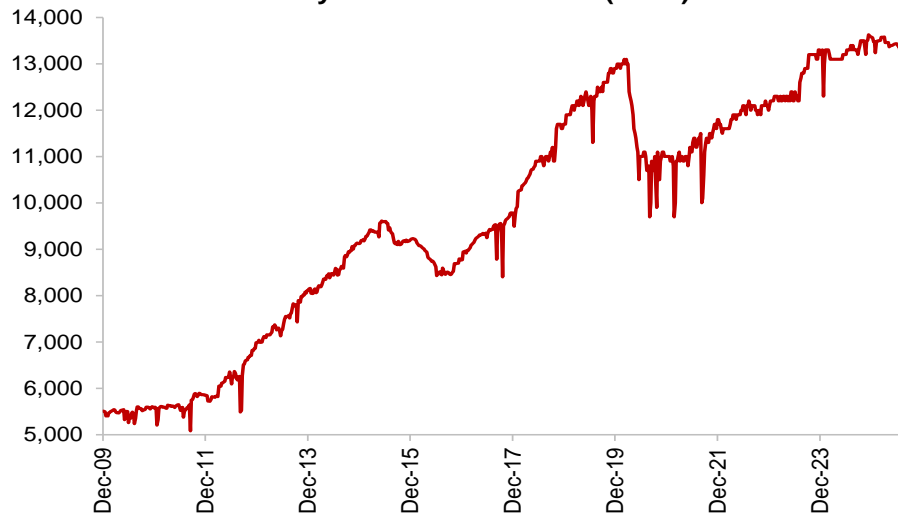


Oil Macro Backdrop

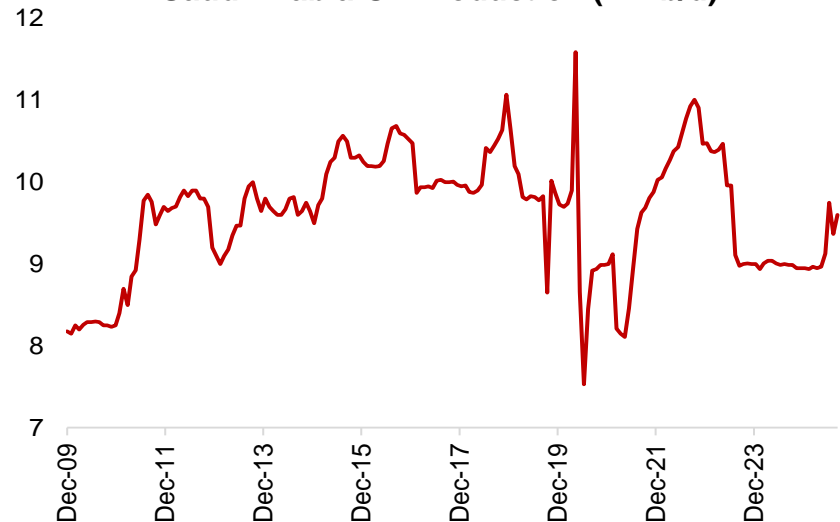
How we got here

- U.S. impact as swing producer weighed on global markets since 2011
- Saudi Arabia and OPEC+ protected price over market share (until they didn't)
- Saudi Arabia production dropped from 11 mmb/d in September 2022 to 8.9 mmb/d in January 2025; 9.6 mmb/d now
- Charts below were a precursor something would give; OPEC+ wouldn't cede share forever

Weekly U.S. Oil Production (mb/d)



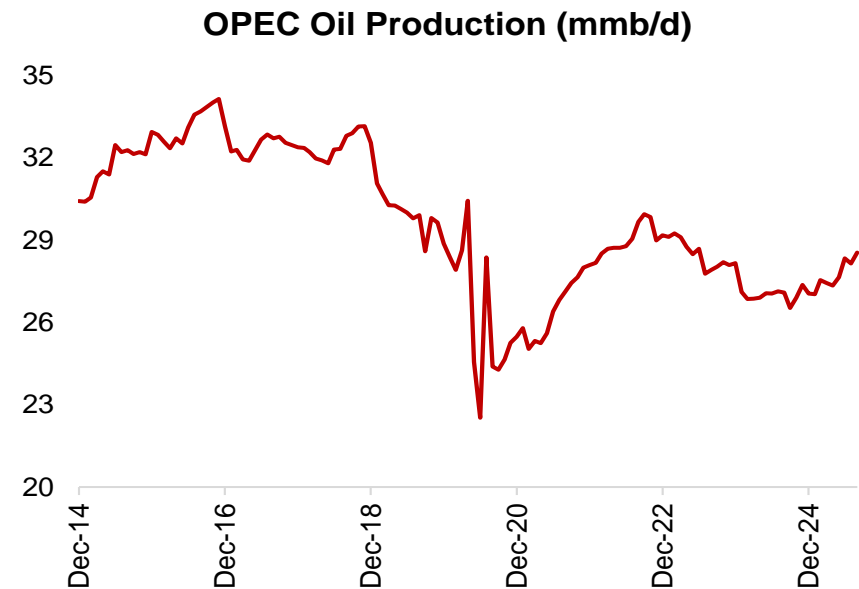
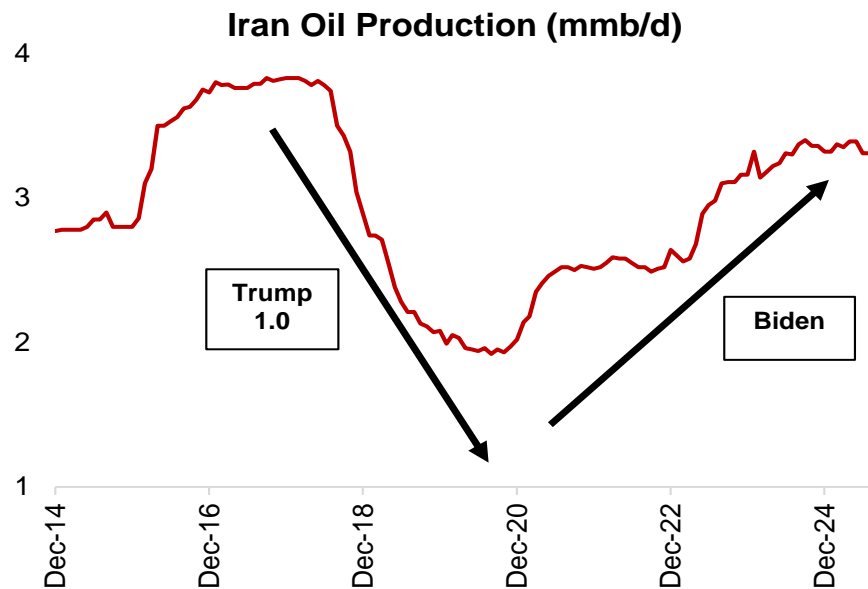
Saudi Arabia Oil Production (mmb/d)



Oil Macro Backdrop

OPEC+ remains the uncertainty on global supply

- OPEC+ to gradually add back 2.2 mmb/d of production
- Marketplace consternation persists on this news, with sentiment generally bearish
 - Actual strategy shift or jawboning to bring U.S. shale oil down?
 - Did Saudi Arabia cut a deal with Trump Administration? Are they targeting Kazakhstan and Iraq, who overproduced vs. quotas?

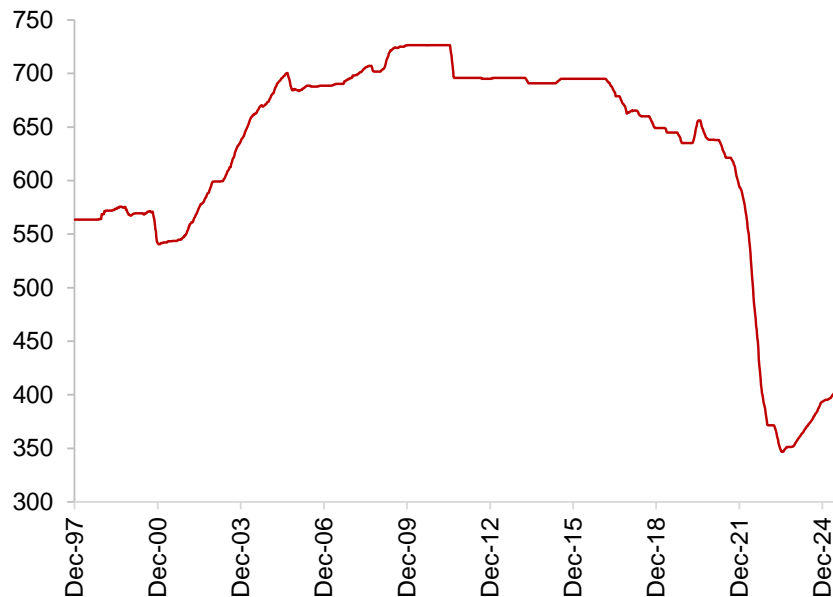


Oil Macro Backdrop

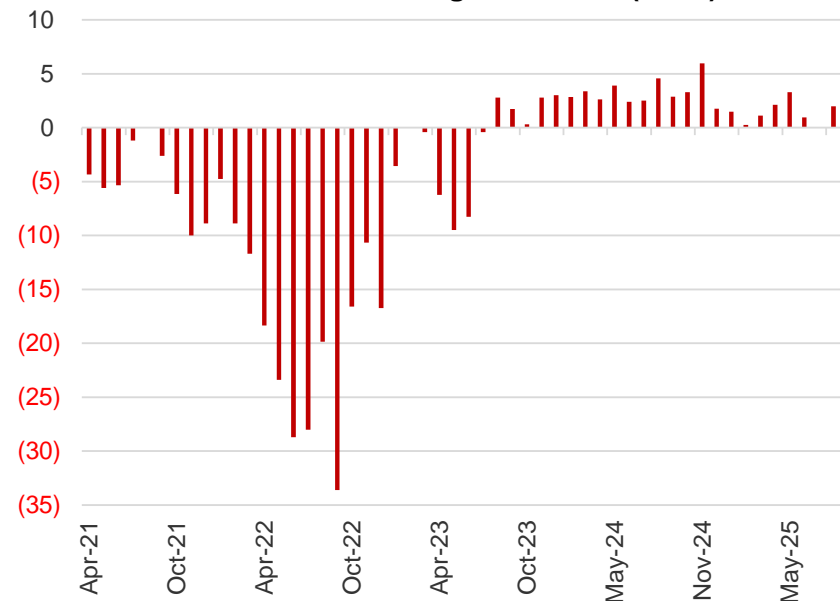
SPR replenishment – Trump expected to accelerate Biden’s refill trickle

- Biden administration surprised us: 47 mmb of additions to SPR in 2023-2024; Trump added 12 mmb YTD
- What is Trump’s “right to the top” refill? 727 mmb in November 2010? 656 mmb in July 2020?
- Refilling to 727 mmb implies 322 mmb more to be repurchased

Weekly U.S. Stocks of Crude Oil in SPR (mmb)



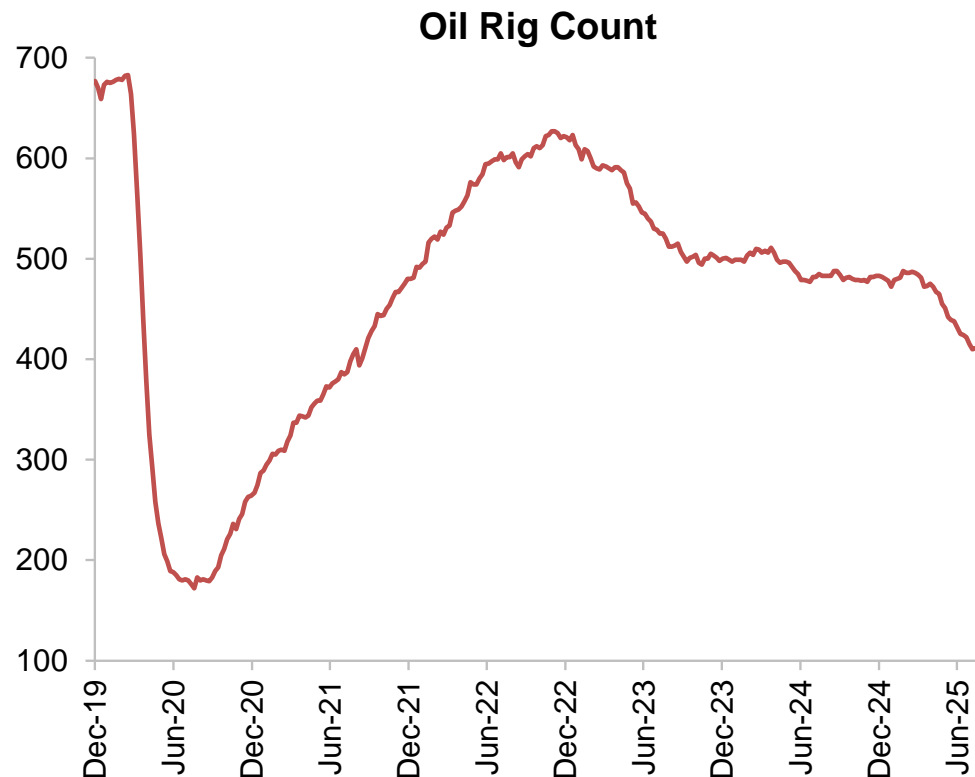
SPR m/m Change in Stocks (mmb)



Oil Macro Backdrop

Oil rig count rolling over, but we do not expect significant production impact

- Industry-wide comments during earnings confirm modest reductions in activity likely
- Rig count reductions announced by many operators: APA, FANG, MTDR, OXY, others
- Is rig count a false flag? We say yes, given DUCs and efficiencies from high-spec rigs



Source: Baker Hughes

Degradation Trends in U.S. Shale: The Productivity Wave Has Crested

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Degradation Trends in U.S. Shale

Well productivity expectations matter as much as the macro backdrop

- **The “D” word is a big deal for shale operators.** We have done extensive work analyzing productivity trends and we have seen clear degradation across all large oil shale basins.
- **Degradation is pervasive.** Degradation is an inconvenient truth in the oil patch. It validates investor concerns about the maturation of shale and remaining Tier 1 inventory.
- **We acknowledge cost reductions are the offsetting factor to degradation.** Our analysis excludes capital efficiency tailwinds from lower well costs; a 25% well cost reduction and a 15% productivity decrease may still mean better half-cycle returns for operators.
- **Bottoms-up analysis needed to see which companies are more impacted.** Top-down trends show declining productivity; bottoms-up analysis separates operators running out of core inventory and feeling pressure to do M&A from those who maintain a deep runway.
- **Large operators dominate basin-specific data sets.** We note the influence large operators have on results. Our analysis is based on initial, not current, operators.

Degradation Trends in U.S. Shale

Midland Basin trends

- Clear degradation since 2021, but surprisingly modest through 2024
- Only basin besides Williston to average 10,000' laterals as early as 2021
- Initial operator data set dominated by Pioneer (16%), Endeavor (7%), Diamondback (7%), XTO/Exxon Mobil (6%)

Vintage	Count*	(ft)* Lateral	First 6M Oil per 1,000'	First 6M BOE per 1,000'	First 12M Oil per 1,000'	First 12M BOE per 1,000'	First 36M Oil per 1,000'	First 36M BOE per 1,000'	12M % Oil
2016	1,135	8,193	9,148	11,338	14,646	18,869	26,120	36,541	77%
2017	1,592	8,810	9,598	11,788	15,089	19,322	25,878	36,436	78%
2018	2,320	9,250	9,670	11,803	15,185	19,386	25,343	35,699	78%
2019	2,463	9,709	10,049	12,314	15,437	19,920	25,165	36,162	77%
2020	1,715	9,917	10,246	12,452	15,966	20,398	25,948	36,771	79%
2021	2,353	10,444	10,367	12,662	15,898	20,435	25,480	36,557	79%
2022	2,682	10,899	9,559	11,616	14,798	18,934	25,398	35,527	79%
2023	2,840	11,112	9,465	11,614	14,476	18,671	-	-	78%
2024	2,035	11,645	9,585	11,933	14,750	19,125	-	-	78%
Average	19,135	10,179	9,764	11,963	15,160	19,467	25,563	36,274	78%

*count of wells with at least 6 months data

Wells with first 6 mos of production $\geq 40\%$ oil and lateral lengths $\geq 4,000'$

'24 vs. peak ('20): 17% -6% -4% -8% -6%

Degradation Trends in U.S. Shale

Delaware Basin trends

- Second worst degradation trends of the five plays we analyzed, with results sharply below 2016-2017 level
- Eastern Lea County, NM appears to be the last delineation frontier in this play
- Initial operator data set dominated by EOG (13%), Mewbourne (6%), Anadarko/Occidental (6%)

Vintage	Count*	(ft)* Lateral	First 6M Oil per 1,000'	First 6M BOE per 1,000'	First 12M Oil per 1,000'	First 12M BOE per 1,000'	First 36M Oil per 1,000'	First 36M BOE per 1,000'	12M % Oil
2016	799	5,812	16,515	23,427	26,453	38,746	47,011	71,917	69%
2017	1,346	6,618	16,291	23,193	26,032	38,238	46,220	71,529	69%
2018	2,236	7,303	15,481	22,017	24,420	35,684	42,093	64,788	70%
2019	2,484	8,055	15,230	21,683	23,261	34,160	39,174	61,057	70%
2020	1,647	8,494	15,129	21,997	23,565	35,367	39,830	63,534	69%
2021	2,087	8,901	16,196	23,710	24,437	36,897	39,918	63,962	68%
2022	2,657	8,962	15,434	22,323	23,026	34,337	37,821	60,862	69%
2023	2,679	9,329	14,307	20,786	21,714	32,603	-	-	69%
2024	1,996	9,580	14,550	21,661	21,153	32,058	-	-	69%
Average	17,931	8,387	15,318	22,139	23,605	35,078	41,314	64,718	69%

*count of wells with at least 6 months data

Wells with first 6 mos of production $\geq 40\%$ oil and lateral lengths $\geq 4,000'$

'24 vs. peak ('16): 65% -12% -8% -20% -17%

Degradation Trends in U.S. Shale

Eagle Ford Shale trends

- Worst degradation trends of the five plays, including worst peak-to-trough 12M oil productivity per 1,000'
- Short laterals, relative to other plays, suggest limited undeveloped acreage left
- Initial operator data set dominated by EOG (17%), Marathon (10%), ConocoPhillips (9%)

Vintage	Count*	(ft)* Lateral	First 6M Oil per 1,000'	First 6M BOE per 1,000'	First 12M Oil per 1,000'	First 12M BOE per 1,000'	First 36M Oil per 1,000'	First 36M BOE per 1,000'	12M % Oil
2016	1,136	6,414	11,834	15,910	17,857	24,609	28,084	39,867	75%
2017	1,478	6,907	13,283	17,447	19,793	26,633	30,364	41,895	77%
2018	1,663	7,479	12,723	16,918	18,513	25,333	28,029	39,703	76%
2019	1,671	7,518	12,595	16,744	18,191	24,844	27,866	39,413	77%
2020	904	7,890	11,064	14,422	17,114	23,015	27,162	37,648	78%
2021	926	7,589	14,499	19,533	21,108	29,259	31,555	45,230	76%
2022	1,090	8,136	12,311	16,699	17,983	25,142	27,362	38,311	76%
2023	1,128	8,673	10,890	14,716	15,873	22,106	-	-	77%
2024	848	9,024	11,980	16,496	15,417	22,759	-	-	75%
Average	10,844	7,650	12,410	16,589	18,260	25,072	28,724	40,437	76%

*count of wells with at least 6 months data

Wells with first 6 mos of production $\geq 40\%$ oil and lateral lengths $\geq 4,000'$

'24 vs. peak ('21): 19% -17% -16% -27% -22%

Degradation Trends in U.S. Shale

DJ Basin trends

- Notable degradation across 6M and 12M intervals
- Intriguing results over first 36M in 2021 and 2022 suggest longer-term production holding up better than earlier vintages
- Initial operator data set dominated by Anadarko/Occidental (20%), PDC Energy/Chevron (12%), Noble/Chevron (11%)

Vintage	Count*	(ft)* Lateral	First 6M Oil per 1,000'	First 6M BOE per 1,000'	First 12M Oil per 1,000'	First 12M BOE per 1,000'	First 36M Oil per 1,000'	First 36M BOE per 1,000'	12M % Oil
2016	536	6,367	8,247	12,002	12,438	19,979	18,608	34,542	63%
2017	1,059	7,771	7,726	10,825	12,054	18,544	18,319	32,799	67%
2018	1,192	7,783	7,077	9,973	11,092	17,289	17,071	31,249	65%
2019	1,127	8,471	7,109	10,507	11,117	18,289	16,842	32,489	62%
2020	559	9,004	7,010	10,429	11,087	18,203	17,378	33,349	62%
2021	776	8,889	6,995	9,909	11,932	18,391	18,929	33,252	66%
2022	601	9,795	6,829	9,782	11,772	18,402	19,514	36,456	66%
2023	652	9,829	7,246	10,163	11,968	18,431	-	-	67%
2024	500	10,121	6,971	9,694	11,129	17,666	-	-	65%
Average	7,002	8,534	7,242	10,354	11,604	18,301	17,796	32,809	65%

*count of wells with at least 6 months data

Wells with first 6 mos of production $\geq 40\%$ oil and lateral lengths $\geq 4,000'$

'24 vs. peak ('16): 59% -15% -19% -11% -12%

Degradation Trends in U.S. Shale

Williston Basin trends

- Similar to Midland Basin, among the more resilient shale plays
- 2024 trends (per 1,000' of lateral) are promising and buck the industry trend of longer laterals having weaker early productivity on a normalized basis
- Initial operator data set dominated by Continental (9%), Whiting/Chord (8%), Hess (7%)

Vintage	Count*	(ft)* Lateral	First 6M Oil per 1,000'	First 6M BOE per 1,000'	First 12M Oil per 1,000'	First 12M BOE per 1,000'	First 36M Oil per 1,000'	First 36M BOE per 1,000'	12M % Oil
2016	713	9,714	8,537	10,618	13,916	17,792	23,424	31,162	80%
2017	972	9,901	10,515	13,016	17,296	22,048	27,951	37,452	80%
2018	1,259	10,094	10,944	13,577	18,324	23,452	29,278	39,781	79%
2019	1,283	10,099	11,137	13,790	17,339	22,195	27,657	37,857	79%
2020	597	10,287	11,190	13,952	18,906	24,591	29,725	41,980	78%
2021	681	10,184	11,415	14,158	18,780	24,109	29,655	40,874	79%
2022	759	10,408	10,745	13,304	17,630	22,680	27,955	40,848	79%
2023	1,061	10,747	10,864	13,409	17,427	22,298	-	-	80%
2024	721	11,615	10,767	13,236	17,551	22,333	-	-	80%
Average	8,046	10,312	10,723	13,280	17,476	22,399	28,001	38,245	79%

*count of wells with at least 6 months data

Wells with first 6 mos of production \geq 40% oil and lateral lengths \geq 4,000'

'24 vs. peak ('20): 13% -4% -5% -7% -9%

Deeper Interval Activity Trends in Midland Basin Show Pivot to Tier 2 Is Here

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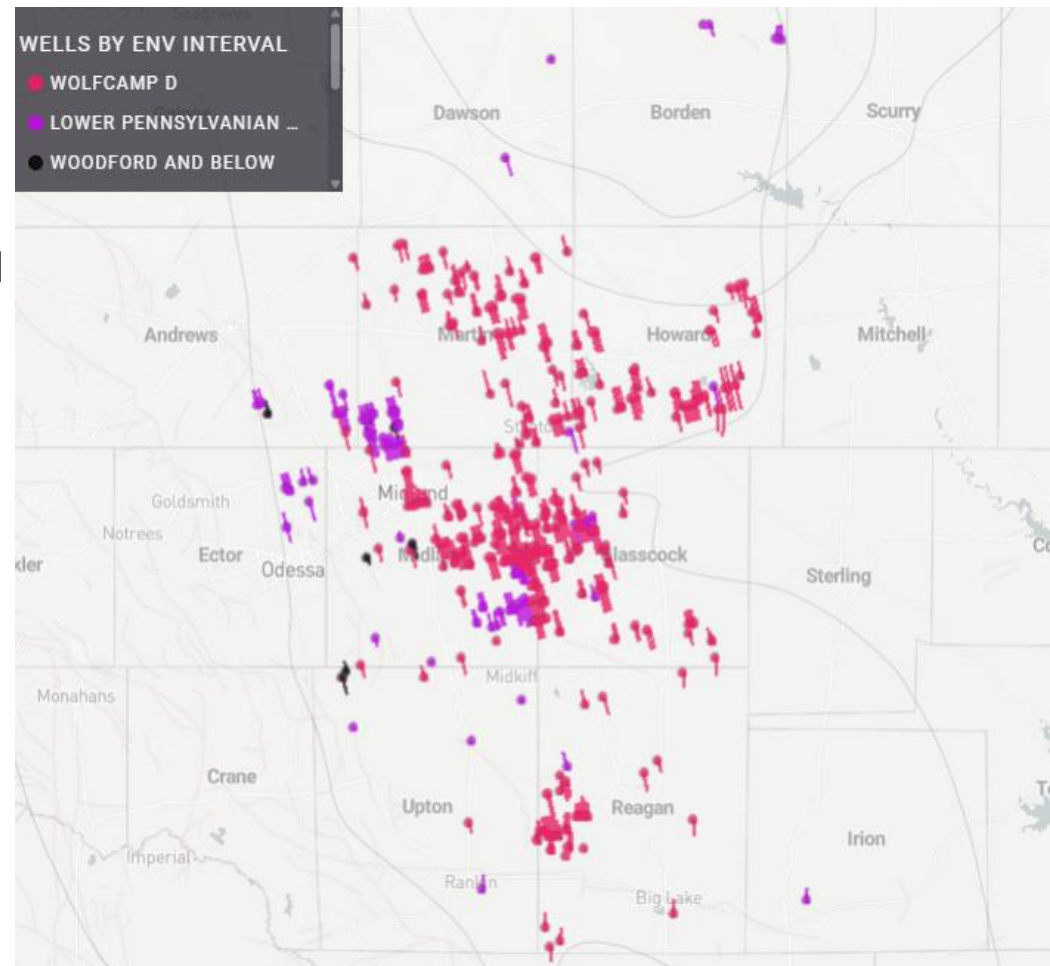


Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin

- We published a deep-dive report on the Midland Basin in July, looking at 19,000+ horizontal wells drilled since 2016
- 624 of these wells have been drilled into “deep” intervals (Wolfcamp D and lower)
 - 492 Wolfcamp D
 - 132 deeper (Lower Pennsylvanian and Mississippian, Woodford and below)
- The focus on deeper intervals is as much a necessity as an intellectual curiosity, given scarcity of Tier 1 inventory

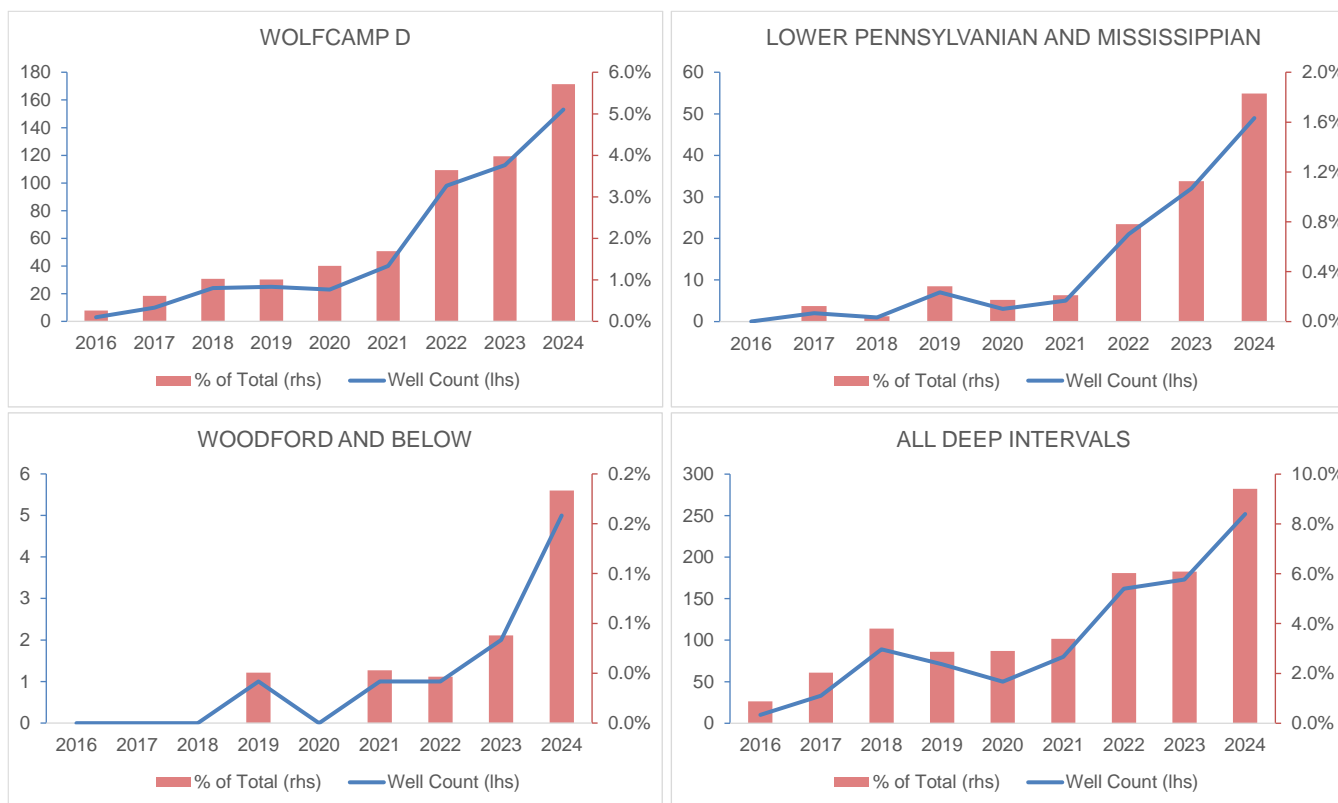
Midland Basin deep interval wells, 2016-2024



Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin

- Deep intervals made up 7.6% of Midland Basin drilling in 2024
- Represented only 1.9% of Midland Basin drilling in 2021
- Given their gassier nature, we expect deeper zones to become a bigger focus as Permian egress improves and as the natural gas macro backdrop improves from LNG export growth



Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin

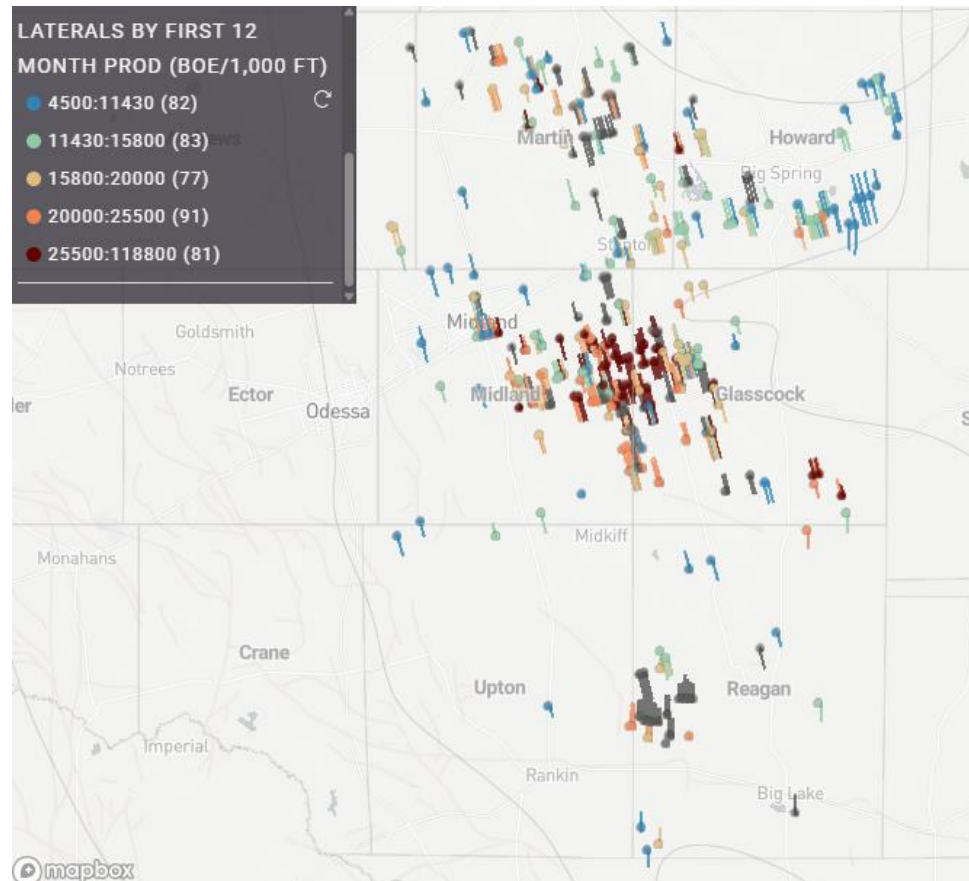
- Localized overpressured area for Wolfcamp D identified near Midland/Glasscock border
- Productivity (both BOE and BBL) of Wolfcamp D matches or exceeds average of all other intervals in the Midland Basin
- We do not see another county in the Midland Basin with similar trends
- This dynamic could limit Wolfcamp D activity unless/until another similar zone is discovered

County	Vintage	Count*		First 12M BOE per 1,000'		12M % Oil		Wolfcamp D productivity vs. Other Intervals	
		Wolfcamp D	Other Intervals	Wolfcamp D	Other Intervals	Wolfcamp D	Other Intervals	BOE basis	BBL basis
MIDLAND	Total	173	5,074	21,187	20,920	74%	79%	1%	-5%
GLASSCOCK	Total	121	1,294	22,416	18,967	67%	75%	18%	6%
MARTIN	Total	80	4,531	15,681	19,666	79%	81%	-20%	-23%
HOWARD	Total	77	2,983	12,098	17,585	72%	82%	-31%	-39%
REAGAN	Total	34	1,759	15,483	16,708	70%	67%	-7%	-3%
UPTON	Total	4	2,063	14,506	20,317	62%	77%	-29%	-42%
ANDREWS	Total	3	737	16,958	18,882	87%	83%	-10%	-6%

Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin: Wolfcamp D Activity

- Localized, overpressured area for Wolfcamp D identified near Midland/Glasscock border
- Results outside of this localized core area showed heterogeneity



Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin: Wolfcamp D by Initial Operator

- The operators that have been most active in the Wolfcamp D are generally those with exposure to the core Midland/Glasscock area we identified
- Those operators have demonstrated stronger results
- Activity and productivity in Wolfcamp D differs drastically by operator

Initial Operator	Vintage	Count*	Lateral (ft)*	First 3M BOE	First 3M BOE per 1,000'	3M % Oil	First 6M BOE	First 6M BOE per 1,000'	6M % Oil	First 12M BOE	First 12M BOE per 1,000'	12M % Oil
CrownQuest	Total	88	10,529	87,707	8,515	74%	150,868	14,629	71%	243,598	23,608	68%
Endeavor Energy	Total	52	10,640	78,284	7,427	80%	145,647	13,804	77%	228,034	21,852	73%
Pioneer	Total	49	10,755	88,622	8,242	77%	154,708	14,409	76%	221,937	22,657	74%
Occidental	Total	48	11,575	63,349	5,486	78%	113,962	9,863	74%	177,604	15,604	71%
XTO Energy	Total	32	12,614	89,512	7,504	77%	161,169	13,327	75%	269,806	22,612	72%
Hannathon Petroleum	Total	23	11,114	45,139	4,222	79%	82,413	7,735	75%	128,965	12,120	69%
Vital Energy	Total	20	12,319	82,251	6,840	71%	155,220	12,804	66%	244,032	21,799	59%
Highpeak	Total	15	14,273	32,041	2,254	86%	65,797	4,692	83%	108,982	7,751	80%
Diamondback	Total	15	11,552	76,295	6,720	76%	134,632	11,427	73%	210,258	17,571	73%
Hibernia Resources	Total	14	12,486	76,188	6,056	75%	157,779	12,333	72%	210,570	18,044	69%
APA Corp	Total	13	12,282	63,571	5,225	73%	151,293	12,080	71%	257,336	21,226	68%
Civitas	Total	13	10,652	56,301	5,114	70%	90,067	8,644	68%	-	-	-
Permian Deep Oil Rock	Total	11	11,254	42,901	4,473	85%	83,532	8,859	85%	163,443	17,841	84%
Black Swan	Total	11	10,071	59,425	5,936	82%	104,517	10,423	80%	168,379	16,743	83%
Ovintiv	Total	11	10,560	61,095	6,062	83%	108,710	10,480	82%	154,519	12,337	82%
SM Energy	Total	8	10,388	63,650	6,634	76%	106,532	11,164	75%	158,007	16,530	75%
Vencer Energy	Total	8	8,191	79,557	10,472	71%	126,244	16,526	69%	248,769	33,738	70%
Lario	Total	8	9,190	53,597	6,063	86%	89,455	10,142	83%	138,336	15,692	80%
WOLFCAMP D	Total	508	10,930	70,128	6,601	77%	127,405	11,931	75%	199,156	19,066	73%
All Other Intervals	Total	19,717	10,215	61,333	6,232	85%	117,733	11,945	82%	190,689	19,474	78%

Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin: Barnett Activity

- Other than Wolfcamp D, the Barnett has been the most actively drilled deep interval
- Martin and Midland wells represent 65% of total Barnett activity
- Among operators, Occidental and Pioneer represented 65% of total Barnett activity
- Lower oil skew, but stronger BOE per 1,000' of lateral creates natural gas optionality

County	Vintage	Count*	Lateral (ft)*	First 3M BOE	First 3M BOE per 1,000'	3M % Oil	First 6M BOE	First 6M BOE per 1,000'	6M % Oil	First 12M BOE	First 12M BOE per 1,000'	12M % Oil
MARTIN	Total	46	10,270	87,713	8,391	64%	165,976	15,636	63%	256,179	24,808	63%
MIDLAND	Total	39	10,294	74,784	7,088	67%	134,394	12,920	66%	216,597	21,206	69%
GLASSCOCK	Total	9	10,249	58,013	5,658	62%	121,135	11,595	60%	208,308	19,646	58%
ECTOR	Total	10	11,309	94,704	8,249	68%	191,538	16,023	60%	277,546	24,732	56%
ANDREWS	Total	11	10,825	69,960	6,463	71%	131,531	11,789	67%	261,032	23,585	61%
BORDEN	Total	5	9,036	26,961	3,078	91%	46,882	5,346	91%	74,530	8,492	90%
UPTON	Total	4	12,612	71,567	5,395	68%	130,097	9,952	65%	293,505	19,756	69%
REAGAN	Total	3	11,189	53,205	4,807	71%	127,900	12,362	70%	-	-	-
HOWARD	Total	1	13,030	51,611	3,961	85%	108,843	8,353	80%	183,541	14,086	77%
DAWSON	Total	1	12,155	97,470	8,019	92%	155,241	12,772	91%	241,937	19,904	90%
IRION	Total	1	7,644	13,111	1,715	22%	-	-	-	-	-	-
LOWER PENNSYLVANIA	Total	130	10,464	76,407	7,169	67%	143,933	13,417	66%	230,199	21,839	66%
All Other Intervals	Total	20,093	10,232	61,457	6,118	85%	117,825	11,708	82%	190,697	19,063	78%

Initial Operator	Vintage	Count*	Lateral (ft)*	First 3M BOE	First 3M BOE per 1,000'	3M % Oil	First 6M BOE	First 6M BOE per 1,000'	6M % Oil	First 12M BOE	First 12M BOE per 1,000'	12M % Oil
Occidental	Total	53	10,099	82,089	7,972	63%	154,344	14,763	62%	239,144	23,558	62%
Pioneer	Total	32	11,291	89,766	7,938	75%	161,922	14,499	74%	256,693	22,826	74%
Continental	Total	8	11,273	93,063	8,199	65%	179,159	15,277	59%	232,949	22,403	59%
Fasken O&R	Total	9	11,039	75,346	6,967	72%	144,035	12,838	68%	280,978	24,945	68%
LOWER PENNSYLVANIAN	Total	130	10,464	76,407	7,169	67%	143,933	13,417	66%	230,199	21,839	66%

Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin: Early Days for the Woodford

- Ten wells drilled between 2016-2024
- Half of those wells were drilled in 2024
- As expected with the greater depth, wells have much lower oil skews (52% first 12M oil)
- Data validate our view that Permian natural gas growth will outpace Permian oil growth through the end of the decade

Interval	Vintage	Count*	Lateral (ft)*	First 3M BOE	First 3M BOE per 1,000'	3M % Oil	First 6M BOE	First 6M BOE per 1,000'	6M % Oil	First 12M BOE	First 12M BOE per 1,000'	12M % Oil
WOODFORD AND BELOW	2019	1	8,130	1,878	231	40%	4,328	532	38%	28,440	3,498	20%
WOODFORD AND BELOW	2021	1	3,997	9,308	2,329	40%	19,774	4,947	36%	38,238	9,567	33%
WOODFORD AND BELOW	2022	1	10,221	88,308	8,640	78%	202,255	19,788	76%	287,017	28,081	74%
WOODFORD AND BELOW	2023	2	8,669	28,793	3,320	67%	50,969	5,942	65%	91,896	10,669	60%
WOODFORD AND BELOW	2024	5	9,284	57,785	6,249	66%	108,258	11,787	64%	160,486	19,448	57%
WOODFORD AND BELOW	Total	10	8,610	44,601	4,908	62%	86,958	9,609	60%	127,368	15,104	52%
All Other Intervals	Total	20,213	10,235	61,562	6,125	84%	117,989	11,718	82%	190,908	19,078	78%

Oil Macro Backdrop

Deeper Interval Activity in the Midland Basin: More Natural Gas Egress Needed

- Seven natural gas pipelines under construction or at FID tell you how much natural gas growth is coming out of the Permian
- Another 5.2 Bcf/d pre-FID projects likely to come on-line
- Matterhorn showed how much “boxed out” natural gas will produce as egress improves

Pipeline Name	(Ownership) Operator	Status	(Bcf/d) Capacity	Estimated In-Svc Date
Matterhorn Expansion	WhiteWater (65%)	Construction	0.50	4Q25
Gulf Coast Express Pipeline	Kinder Morgan (34%)	Construction	0.57	2Q26
Blackcomb Pipeline	WhiteWater (51%)	Construction	2.50	2H26
Hugh Brinson Phase 1	Energy Transfer (100%)	Construction	1.50	4Q26
Hugh Brinson Phase 2	Energy Transfer (100%)	FID	0.70	NA
Eiger Express Pipeline	WhiteWater (45.5%)	FID	2.50	Mid-2028
Desert Southwest Pipeline	Energy Transfer (100%)	FID	1.50	4Q29
Total FID			9.77	
Tallgrass Permian to Rockies	Tallgrass (100%)	Pre-FID	2.40	Late-2028
Saguaro Connector Pipeline	ONEOK (100%)	Pre-FID	2.80	NA
Total			14.97	

Produced Water Trends Another Headwind for Tier 2 Inventory

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Oil Macro Backdrop

Produced Water Trends Bearish for Industry

- Amid degradation for the New Mexico Delaware Basin, water/oil ratios have increased
- We conducted a study of produced water trends in the New Mexico Delaware Basin
- Extrapolations to all unconventional plays will not be accurate, but the direction of trends show one more way in which Tier 2 inventory is inferior in this play

Vintage	Count*	(ft)* Lateral	First 3M BOE per 1,000'	3M % Oil	3M water/oil	First 6M BOE per 1,000'	6M % Oil	6M water/oil	First 12M BOE per 1,000'	12M % Oil	12M water/oil
2016	305	5,187	15,564	75%	1.99	27,990	72%	1.88	43,767	70%	1.94
2017	473	6,016	15,717	73%	2.28	27,795	71%	2.17	43,666	68%	2.24
2018	879	6,568	15,212	73%	2.40	26,362	72%	2.29	40,739	69%	2.32
2019	1,025	7,468	15,539	73%	2.36	26,384	71%	2.26	40,298	69%	2.33
2020	801	8,181	15,246	71%	2.49	26,450	70%	2.43	41,356	68%	2.50
2021	1,238	8,682	14,452	71%	2.64	25,744	69%	2.53	39,647	67%	2.60
2022	1,723	8,763	13,938	71%	2.72	24,548	69%	2.59	37,661	67%	2.63
2023	1,593	9,025	12,885	72%	2.64	22,825	70%	2.48	36,122	67%	2.52
2024	809	9,465	13,111	71%	2.77	23,088	71%	2.45	-	-	-
Avg/Total	8,846	8,172	14,325	72%	2.57	25,236	70%	2.43	39,472	68%	2.48

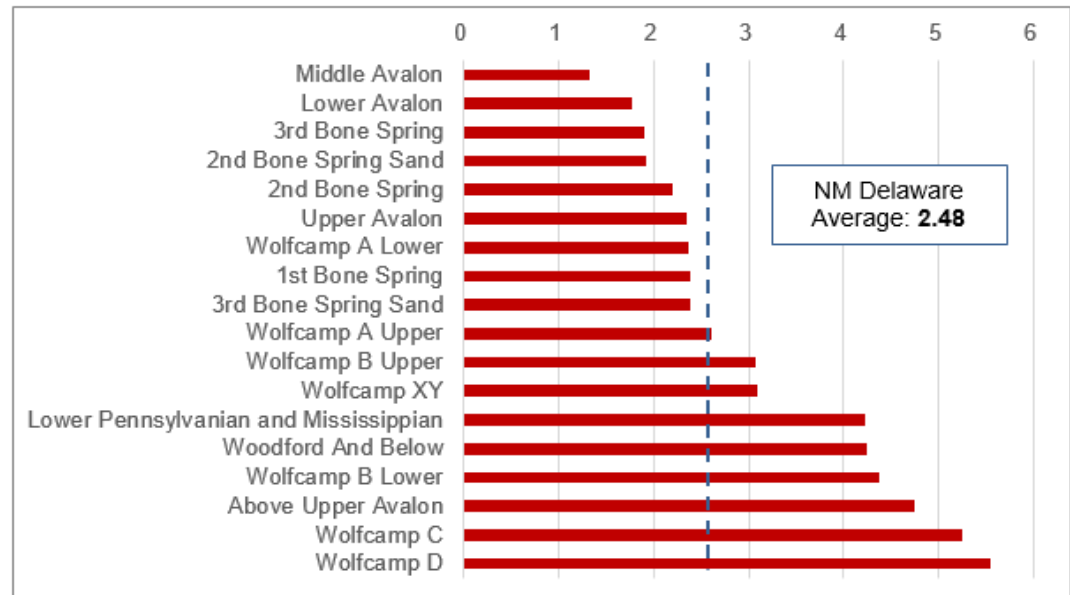
*count of wells with at least 3 months data

Oil Macro Backdrop

Produced Water Trends Bearish for Industry

- Deeper intervals in NM Delaware Basin have higher water/oil ratios, weighing on fully-burdened IRRs for operators
- Wolfcamp D is a negative standout, relative to other zones

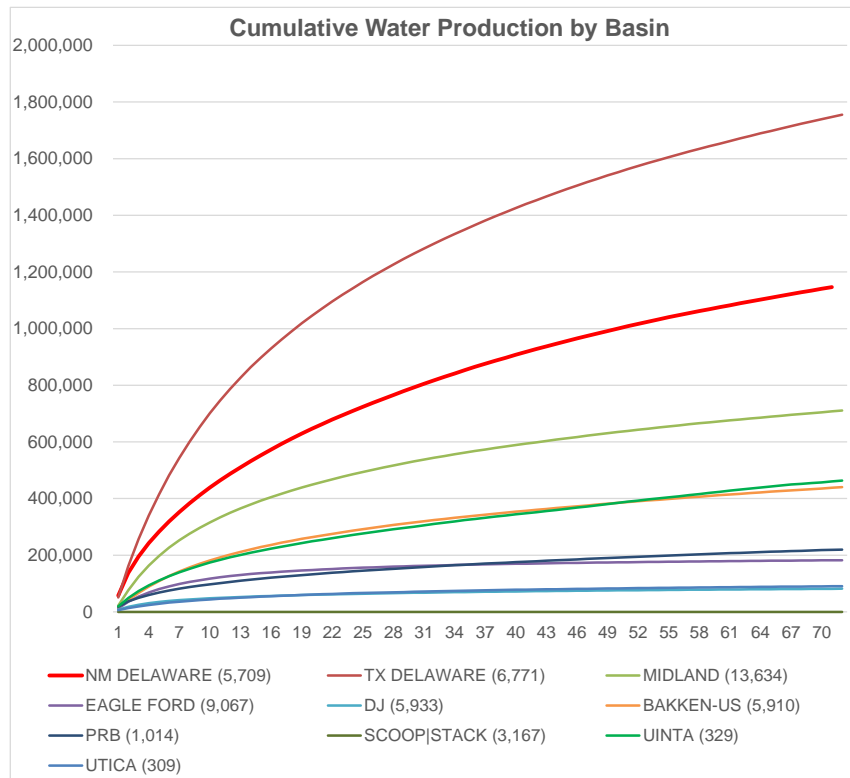
(from 2016-2023) Initial Operator	First 12M Water/Oil	Count
Middle Avalon	1.3	272
Lower Avalon	1.8	208
3rd Bone Spring	1.9	420
2nd Bone Spring Sand	1.9	1,409
2nd Bone Spring	2.2	193
Upper Avalon	2.3	85
Wolfcamp A Lower	2.4	1,087
1st Bone Spring	2.4	267
3rd Bone Spring Sand	2.4	569
Wolfcamp A Upper	2.6	1,541
Wolfcamp B Upper	3.1	300
Wolfcamp XY	3.1	560
Lower Pennsylvanian and Mississippian	4.2	12
Woodford And Below	4.2	2
Wolfcamp B Lower	4.4	198
Above Upper Avalon	4.7	31
Wolfcamp C	5.2	326
Wolfcamp D	5.5	62



Oil Macro Backdrop

Produced Water Trends Bearish for Industry

- Delaware and Midland basins are head and shoulders above other unconventional oil plays, in terms of cumulative water production
- Pivot to Tier 2 inventory may exacerbate this trend



Basin (count)	Cumulative Water/Oil Ratio by:			
	Month12	Month24	Month36	Month60
TX DELAWARE (6,771)	3.8	4.0	4.1	4.2
NM DELAWARE (5,709)	2.9	2.9	3.0	3.0
MIDLAND (13,634)	2.0	2.1	2.1	2.1
UINTA (329)	1.1	1.2	1.2	1.3
BAKKEN-US (5,910)	1.2	1.3	1.3	1.4
PRB (1,014)	0.7	0.7	0.7	0.7
EAGLE FORD (9,067)	1.0	0.9	0.8	0.7
UTICA (309)	0.4	0.4	0.4	0.4
DJ (5,933)	0.5	0.5	0.5	0.5
Average of 8 regions	1.4	1.4	1.4	1.4

Oil Macro Backdrop

Conclusion

- Reduction in oil prices driven by policy, not physical market dynamics and policy remains fluid
- OPEC+ ability to bring back 2 mmb/d of volumes is not a given
- Large producers reduced activity, creating permission for smaller peers to follow suit, which extends inventory life and delays the pivot to Tier 2 inventory
- Activity reductions to date are modest, resulting in minimal impact to U.S. oil production
- We see asymmetric upside to oil prices from here and maintain our mid-\$60's outlook

Price Deck		2024A	1Q25A	2Q25A	3Q25A/E	4Q25E	2025E	1Q26E	2Q26E	3Q26E	4Q26E	2026E	LT
HHub	KBCM (\$/mcf)	\$2.28	\$3.65	\$3.44	\$3.07	\$3.45	\$3.40	\$4.00	\$3.40	\$3.40	\$4.00	\$3.70	\$3.75
	NYMEX Strip					\$3.31	\$3.37	\$3.90	\$3.54	\$3.88	\$4.19	\$3.88	
WTI	KBCM (\$/b)	\$75.79	\$71.42	\$63.68	\$65.00	\$64.00	\$66.00	\$65.00	\$65.00	\$65.00	\$65.00	\$65.00	\$65.00
	NYMEX Strip				\$65.09	\$62.35	\$65.64	\$61.44	\$61.34	\$61.23	\$61.13	\$61.29	
Brent	KBCM (\$/b)	\$79.87	\$74.89	\$66.55	\$68.00	\$66.50	\$69.00	\$68.00	\$68.00	\$68.00	\$68.00	\$68.00	\$68.00
	ICE Strip				\$68.15	\$66.09	\$68.92	\$65.20	\$65.05	\$64.92	\$64.88	\$65.01	

Disclosure Appendix

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