WHITE PAPER · KANSAS UPSTREAM · SEPTEMBER 2026

Kansas Drilled the Wells. It Never Finished Them.

$5 billion of recoverable oil sits behind steel pipe in wells Kansas has already paid for. On the current decline, the state and its counties forgo $368 million of tax revenue over the next decade rather than produce it.

The Case for Acquiring Kansas Oil Wells and Recompleting Stacked Pay Zones Instead of Drilling New Ones

$5.0B	71.2 MM	$368M	61%
NET WELLHEAD REVENUE BEHIND CASING	BARRELS RECOVERABLE BASE CASE	STATE AND LOCAL TAX FORGONE BY 2035	OF KANSAS OIL WELLS BELOW BREAKEVEN

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September 2026 · For discussion with operators, mineral owners, county officials, and capital partners

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WHAT THIS PAPER FINDS

18

ZONES, ONE PERFORATED

Kansas produces oil from eighteen stratigraphic zones and as many as twelve can be productive at a single locality, yet roughly half of producing fields are developed as single-pay fields — and those account for only about a fifth of cumulative state production.

1.46

BARRELS A DAY, ON AVERAGE

47,494 producing oil wells average 1.46 barrels a day and 61% produce less than one. Four barrels a day would place a well above 92% of the state, which is the entire bar a recompletion has to clear.

3×

CHEAPER PER BARREL OF CAPACITY

A base-case recompletion adds capacity at roughly $5,700 per incremental barrel per day against $15,000 to $17,600 for a new infill well, and it inherits a tank battery, road, power drop and disposal arrangement worth $50,000 to $70,000 a year.

7

YEARS OF TAX-FREE BARRELS

Kansas statute waives severance tax for seven years on incremental production from a production enhancement project and names recompletion to a different zone in the same wellbore as qualifying. A new well is taxed from its first barrel.

$368M

OF PUBLIC REVENUE ON THE LINE

On the decline Kansas has recorded since 2023, state and local oil tax revenue falls $62.9 million a year by 2035. Meanwhile 29,127 sub-breakeven wells carry roughly $298 million of eventual plugging liability that lands on the state.

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EXECUTIVE SUMMARY

Kansas holds one of the densest inventories of shallow, multi-pay, cased wellbores in North America, and that inventory is being operated at a fraction of its economic potential. In 2025 the state produced 25,398,168 barrels of oil from 47,494 producing oil wells, an average of 1.46 barrels per day per well.[1] Federal data for 2024 show the same picture in finer resolution: of 47,698 producing Kansas oil wells, 61.07% produced less than one barrel per day, 98.06% produced ten barrels per day or less, and exactly 13 wells in the entire state exceeded 100 barrels per day.[2]

That low productivity is not primarily a resource problem. It is a completion and capital-allocation problem. Kansas produces oil from eighteen distinct stratigraphic zones, the Kansas Geological Survey counts roughly 3,900 producing fields, and a single locality can host as many as twelve productive pay zones.[3] Every major Kansas field is a multi-pay field. Yet about half of all producing fields are developed as single-pay fields, and those single-pay fields account for only about one-fifth of cumulative state production — meaning the productive weight of the state sits in stacked-pay geology while half its field development treats the subsurface as a single target.

Three independent lines of evidence establish that substantial recoverable oil sits behind casing in existing Kansas wellbores rather than in undrilled locations:

- **Recovery efficiency is low by design.** Primary recovery from the Lansing–Kansas City oomoldic reservoirs — the single most widespread oil zone in the state, productive in 549 fields — is typically below 25% of oil in place, and many of these fields do not respond to waterflooding, leaving high residual oil saturation in place.[4]
- **The federal government classified this exact reservoir type as at-risk abandonment inventory.** The Department of Energy's Class II shallow-shelf carbonate category, which encompasses the Kansas Mississippian and Pennsylvanian carbonates, originally contained more than 68 billion barrels of crude oil, of which more than 48 billion barrels remained at risk of being abandoned.[5]
- **Documented causes of unrecovered oil are wellbore-level, not basin-level.** The Kansas Geological Survey's own screening work identifies openhole and partial completions, inadequate drainage from excessive well spacing, bypassed attic oil, thin pays, and water coning as the operational

[1] University of Kansas, Institute for Policy and Social Research, *Kansas Statistical Abstract*, energy and minerals tables: Kansas oil production and producing oil wells by county.
[2] U.S. Energy Information Administration, *Distribution of U.S. Oil and Natural Gas Wells by Production Rate*, 2025 report, Appendix B, Table B35.
[3] Kansas Geological Survey, *Subsurface Geology Series 9*, page 3.
[4] Kansas Geological Survey, *PRS Poster 2002-48*, [Lansing–Kansas City oomoldic carbonate reservoirs].
[5] U.S. Department of Energy, Office of Fossil Energy, [Techline: reservoir class field demonstration program], 1999.

> heterogeneities that leave significant remaining oil in place.[6] Four of those five causes are addressable with a workover rig, a cement plug, and a perforating gun.

The economics decisively favor the existing wellbore. Drilling and equipping a typical 3,500-to-4,500-foot Kansas well costs approximately $450,000, with a dry hole at that depth costing roughly $180,000.[7] A plug-back-and-perforate recompletion in an existing cased hole costs a fraction of that. Modeled at an $88 per barrel wellhead price and an 80% net revenue interest, a base-case uphole recompletion delivers capital intensity of roughly $5,700 per incremental barrel per day against $15,000 to $17,600 for a new infill well, and it clears its own cost at approximately four incremental barrels per day — a rate that would still place the well in the top 6% of Kansas oil wells.

Kansas tax policy amplifies the advantage. The state's 8% severance tax is expressly waived for seven years on the incremental production resulting from a production enhancement project, and the statute names "recompletion to a different producing zone in the same well bore" as a qualifying project.[8] Incremental barrels from a plug-back are, for seven years, tax-advantaged barrels that a new well cannot match.

Scaled across the state, the prize is large. A base scenario in which 15% of Kansas' 47,494 producing oil wells carry an untested or under-drained zone worth 10,000 incremental barrels each implies 71 million barrels — roughly 2.8 times current annual statewide oil production — recoverable for about $606 million of recompletion capital and generating on the order of $5.0 billion of net wellhead revenue at $88 per barrel. No new drilling permits, no new surface locations, and no new plugging liabilities are required to capture it.

The public balance sheet moves with the same barrels. Kansas taxes oil at a combined state and local rate of approximately 8% of wellhead value, which on 2025 production is roughly $178.8 million a year at $88.[9] On the 4.24% annual decline the state has recorded since 2023, that base falls about $62.9 million a year by 2035, and Kansas and its counties forgo on the order of $368 million across the decade. Meanwhile 29,127 wells — 61.07% of every producing oil well in the state — produce below their own operating cost and carry roughly $298 million of eventual plugging liability at the state program's $10,227 average cost per well.[10] Recompletion preserves the ad valorem base immediately, defers or avoids the plugging bill, and restores taxable severance volume when the seven-year exemption expires — a

[6] Kansas Geological Survey, *Open-File Report 99-22*.
[7] Kansas Independent Oil and Gas Association, [Securities brochure: investing in Kansas oil and gas].
[8] Kansas Department of Revenue, *Kansas Statutes and Regulations for Minerals Severance Tax*, publication MT-6.
[9] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[10] Kansas Corporation Commission, *Abandoned Well Plugging Update*, as of 30 September 2024.

public-revenue swing of roughly $338 million in the base case, funded entirely with private capital. Section 8.2 develops this.

The conclusion for an acquirer is direct: in Kansas, the scarce asset is not acreage or drillable locations. It is a cased, permitted, surface-equipped wellbore that penetrates multiple pay zones and is currently producing from one of them.

1 INTRODUCTION AND THESIS

1.1 The proposition

Kansas is a mature, low-rate, high-well-count oil province. Conventional industry logic treats maturity as exhaustion and responds either by drilling new wells or by exiting. This paper argues a third position: the highest risk-adjusted return in Kansas is the acquisition of existing wellbores followed by systematic recompletion — plugging back from a depleted or watered-out zone and perforating one or more shallower zones that were logged, noted, and never produced.

The thesis rests on four claims, each tested against primary data in the sections that follow:

1. **Stacked pay is the geological norm in Kansas, not the exception.** Eighteen stratigraphic zones produce oil statewide, and up to twelve can be productive at one locality.
2. **The existing wellbore inventory already penetrates that stacked section.** Roughly 47,500 wells produce at an average of 1.46 barrels per day, and the state's databases record which zones each wellbore passed through.
3. **Historical completion practice and operator capital constraints systematically left uphole zones untested.** Half of Kansas' producing fields are developed as single-pay fields despite the state's multi-pay geology.
4. **The cost asymmetry between a recompletion and a new well is roughly five-to-one to ten-to-one, and Kansas tax law widens it further.**

1.2 What "plug back and perforate" means operationally

The Kansas Corporation Commission defines recompletion as reworking a well "for the purpose of developing new zones after its initial well completion".[11] In practice, an uphole recompletion in a Kansas cased hole follows a short and well-understood sequence:

[11] Kansas Corporation Commission, *General Rules and Regulations for the Conservation of Crude Oil and Natural Gas*.

Step	Operation	Typical purpose
1	Pull rods, tubing, and pump; kill the well	Gain access to the casing string
2	Set a cement or mechanical plug above the existing perforations or openhole section	Isolate the depleted or high-water-cut zone
3	Pressure-test the plug and confirm isolation	Regulatory and mechanical integrity requirement
4	Run modern logs, or re-interpret vintage logs, across the uphole section	Identify the target flow unit and its saturation
5	Perforate the selected interval	Establish communication with the new zone
6	Acidize or stimulate as the lithology requires	Restore or improve near-wellbore permeability, essential in Kansas carbonates
7	Reinstall tubing, pump, and rods; test the well	Return to production on existing surface facilities

A documented Kansas example of exactly this sequence appears in a Department of Energy-supported Lansing–Kansas City project, where well CO2#12 had its Lansing–Kansas City G zone plugged back with cement and a liner cemented across shallow zones, leaving only the Lansing–Kansas City C zone open, while well CO2#10 had a cement plug drilled out to approximately 2,925 feet and the Lansing–Kansas City C zone perforated from 2,898 to 2,910 feet.[12] The interval perforated in that operation was twelve feet thick. That is the scale of the target: thin, discrete, carbonate flow units within a section that a 1950s-to-1980s operator drilled through on the way to a deeper objective.

Related interventions on the same cost curve include adding perforations within an already-open zone, re-perforating intervals damaged by scale or cement, and multiple or commingled completions. Kansas regulation permits commingling production from more than one source of supply upon application to and approval by the Conservation Division, provided total production potential is less than the allowable for a single common source of supply in the immediate area, and it separately defines and governs dual or multiple-completed wells.[13] For low-rate stripper wells, the allowable test is rarely a binding constraint, which means a single Kansas wellbore can legally be made to produce from more than one zone at once.

[12] National Energy Technology Laboratory, *Final report, award DE-FC26-04NT15124*.
[13] Kansas Corporation Commission, *General Rules and Regulations*.

2 THE RESOURCE BASE: KANSAS IS A STACKED-PAY STATE

2.1 Eighteen producing zones

The Kansas Geological Survey classifies the state's producing reservoirs into eighteen major stratigraphic zones based on more than forty years of reported production data. The distribution of fields across those zones is the single clearest statement of the stacked-pay opportunity.

Producing zone	Number of fields	Producing zone	Number of fields
Lansing–Kansas City	549	Pleasanton	30
Arbuckle	more than 400	Atokan and Morrowan	28
Cherokee	380	Shawnee	26
Mississippian	361	Hunton	14
Marmaton	195	Reagan	10
Viola	112	Douglas	9
Simpson	110	Wabaunsee	8
Pennsylvanian Basal Conglomerate	70	Precambrian	7
		Misener	7
		Lower Permian	4

Source: Kansas Geological Survey, Oil and Gas Investigations 16, Producing Zones of Kansas Oil and Gas Fields[14].

Five zones — Lansing–Kansas City, Arbuckle, Cherokee, Mississippian, and Marmaton — each produce in 195 or more separate fields. In much of central and western Kansas these zones are vertically stacked within the same 2,000-to-5,000-foot section that a single wellbore already penetrates.

2.2 Multi-pay is the norm; single-pay development is the practice

The Survey's statewide analysis of producing zones per quarter township is the most important single finding for this thesis. Kansas has about 3,900 producing fields. About one-half of them are single-pay fields, and those single-pay fields account for only about one-fifth of cumulative production in Kansas. Critically, "all major fields in Kansas have multiple pay zones, although one zone is usually more important than

[14] Kansas Geological Survey, *Oil and Gas Investigations 16: Producing Zones of Kansas Oil and Gas Fields*.

the others," and a maximum of twelve producing zones is possible at any given locality.[15]

The Survey is explicit that the mapped count of pay zones is a function not only of geology but of "the exploration maturity of an area" and "the density of drilling," noting that more densely drilled areas show more pay zones "because there is less chance that minor pay zones have been overlooked." It goes further, stating that trends with relatively few pay zones compared with nearby trends may be usefully described as **"underdeveloped."** This is an official state geological survey characterizing parts of its own state as under-completed rather than under-drilled.

Concentrations of multi-zone productivity occur on the Central Kansas uplift, the Pratt anticline, the Hugoton basin near Seward and Meade counties, and the Nemaha uplift near Butler and Cowley counties. Those four trends define the primary geographic screen for an acquisition program.

2.3 Where the oil in place actually sits

The federal resource assessment of the province apportions original oil in place as 47% in Ordovician rocks, mainly Arbuckle–Reagan with some Viola–Simpson, 36% in Pennsylvanian rocks including the Lansing–Kansas City and Cherokee, and the remaining 17% elsewhere.[16] The Arbuckle alone produced approximately 1.4 billion barrels of oil between 1929 and 1968, with several hundred fields productive from Arbuckle rocks on the Central Kansas uplift, and pay zones "almost always close to the top of the unit".[17]

The structural implication is important for recompletion strategy. Because Arbuckle pay is concentrated at the top of the unit and is frequently water-driven with severe water production, many Central Kansas uplift wells were drilled to the Arbuckle, produced it until water cut made them marginal, and were then either abandoned or left pumping at fractional rates — with the entire overlying Mississippian, Cherokee, Marmaton, and Lansing–Kansas City section sitting above the perforations, behind cemented casing.

2.4 Low recovery efficiency in the dominant reservoir type

The Lansing–Kansas City oomoldic carbonates deserve specific attention because they are the most widely productive oil zone in the state and because their recovery characteristics create the bypassed-pay opportunity.

[15] Kansas Geological Survey, *Subsurface Geology Series 9*, page 3.
[16] U.S. Geological Survey, *Open-File Report 87-450E*.
[17] Kansas Geological Survey, *Subsurface Geology Series 9*, page 2.

These reservoirs consist of multiple stacked or en echelon oolite shoals deposited across the entire Kansas Pennsylvanian ramp, with geometries analogous to modern Bahamian oolites.[18] Their pore systems are oomoldic — original grains dissolved to leave molds — which produces high porosity paired with poor pore connectivity. Core work under a Department of Energy project measured a heterogeneous Bethany Falls oomoldic sample at 21% porosity with permeability of only 0.7 millidarcies alongside a relatively homogeneous reservoir core at 24% porosity and 16 millidarcies.[19] A twenty-fold permeability contrast at nearly identical porosity is the petrophysical signature of a reservoir that vintage log analysis routinely misclassified.

The consequence is that primary recovery by solution gas drive in these reservoirs is often below 25% recovery efficiency, and while secondary recovery frequently exceeds primary recovery, many fields do not respond to waterflooding, leaving high residual oil saturations in place.[20] Historical Gorham field analysis reached similar conclusions, reporting waterflood recoveries of 5.7% to 19.6% of original oil in place and estimating that carbon dioxide miscible processes could add 10% to 20% of original oil in place to Lansing–Kansas City recovery.[21]

When a reservoir class recovers under a quarter of its oil in place and resists waterflooding, the reason is usually that large parts of it were never in communication with a wellbore. That is a perforation problem before it is an enhanced-recovery problem.

2.5 The federal characterization of the resource

The Department of Energy's reservoir class program provides the most direct external validation of scale. Class II shallow-shelf carbonate reservoirs — the category into which Kansas Mississippian and Pennsylvanian carbonate production falls — originally contained more than 68 billion barrels of crude oil, of which more than 48 billion barrels remained at risk of being abandoned. Across the program's three reservoir classes, the department stated that the classes together "represent around half of all the remaining recoverable crude oil known to exist in the United States," and that projects were selected specifically in geologic classes that "still contained large quantities of crude oil" while facing "an imminent risk of being abandoned".[22] The program's explicit purpose was to demonstrate techniques adoptable by small independent producers, and it named Kansas Mississippian shallow-shelf carbonate reservoirs as a target.[23]

[18] Kansas Geological Survey, *Open-File Report 2003-32*, [Lansing–Kansas City oolite shoal geometry].
[19] National Energy Technology Laboratory, *Final report, award DE-FC26-04NT15523*.
[20] Kansas Geological Survey, *PRS Poster 2002-48*.
[21] Kansas Geological Survey, *Bulletin 228*, chapter 4, production.
[22] U.S. Department of Energy, Office of Fossil Energy, [Techline: reservoir class program].
[23] Kansas Geological Survey, *Open-File Report 97-24*.

3 THE WELLBORE INVENTORY: WHAT IS ACTUALLY PRODUCING TODAY

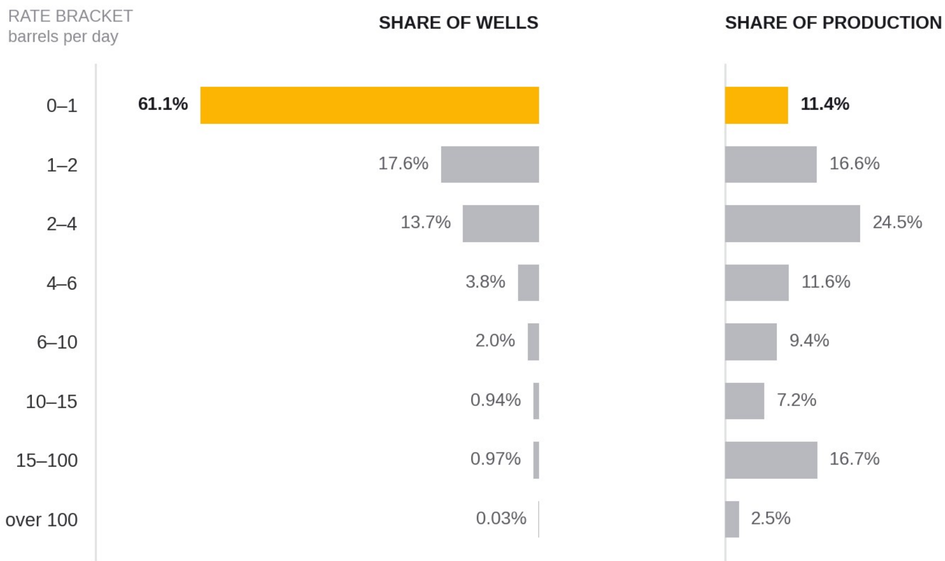
3.1 A state of one-barrel wells

The productivity distribution of Kansas oil wells is extraordinarily concentrated at the bottom of the range.

Rate bracket (bbl/d)	Oil wells	Share of wells	Annual oil production (million bbl)	Share of production	Rate per well (bbl/d)
0–1	29,127	61.07%	3.012	11.44%	0.29
1–2	8,402	17.61%	4.385	16.65%	1.45
2–4	6,517	13.66%	6.446	24.47%	2.73
4–6	1,796	3.77%	3.050	11.58%	4.74
6–10	933	1.96%	2.489	9.45%	7.39
10–15	446	0.94%	1.882	7.15%	11.78
15–100	464	0.97%	4.407	16.73%	26.02
Over 100	13	0.03%	0.671	2.55%	141.4
Total	**47,698**	**100%**	**26.343**	**100%**	**1.55**

Source: U.S. Energy Information Administration, Distribution of U.S. Oil and Natural Gas Wells by Production Rate, 2025 report, Table B35[24].

[24] U.S. Energy Information Administration, *Distribution of Wells by Production Rate*.



29,127 wells — 61% of the state — produce 11% of Kansas oil

FIGURE 2 Kansas oil wells by production rate. The state's inventory and its output sit in different brackets: 61.1% of wells produce less than one barrel a day and deliver 11.4% of production, while the 2–4 bbl/d bracket — 13.7% of wells — delivers the largest single share. Data: U.S. Energy Information Administration, 2025 report, Table B35.

Three observations follow. First, 46,775 wells — 98.06% of the state's oil wells — produce ten barrels per day or less and together account for 73.58% of Kansas oil production. Second, the modal Kansas oil well produces less than one barrel per day, which is barely above the threshold at which a pumping unit, electricity, and salt-water disposal can be justified. Third, and most consequentially for a recompletion thesis, moving a well from 1 barrel per day to 6 barrels per day moves it from the 61st percentile to roughly the 98th percentile of the entire state. The bar for a "good well" in Kansas is very low, which means the incremental rate required to make a recompletion successful is correspondingly low.

3.2 Statewide production and well counts

State-reported data confirm the federal picture and show the trend.

Year	Oil production (bbl)	Producing oil wells	Average bbl/d per well
2023 (revised)	27,697,534	49,245	1.54
2024 (revised)	26,829,707	48,451	1.52
2025	25,398,168	47,494	1.46

Source: Kansas Statistical Abstract, drawing on Kansas Geological Survey statewide production data[25].

[25] University of Kansas, Institute for Policy and Social Research, *Kansas Statistical Abstract*.

Production is declining at roughly 4% to 5% per year while the well count declines at about 2% per year, so per-well productivity is falling. This is the signature of a wellbore population being harvested on decline with minimal reinvestment.

That interpretation is corroborated by drilling statistics. Kansas operators drilled 872 new oil wells in 2022, 636 in 2023, and 653 in 2024, of which only 14, 10, and 12 respectively were horizontal, against a total inventory the Kansas Geological Survey counts at 68,149 producing oil wells and 460,481 total wells in its database.[26] Roughly 650 new wells per year against a producing base of 47,500 is a reinvestment rate of about 1.4% of the well count annually. The state is not drilling its way out of decline, and at that pace it cannot.

The gap between the Survey's count of 68,149 producing oil wells and the 47,494 wells that actually reported production in 2025 is itself informative, though the two figures are constructed differently — the Survey counts wells with valid completion or spud dates and no plugging date, and cautions that "a certain percentage of older wells are plugged but do not have a plugging date." Even allowing generously for that data artifact, the difference points to a meaningful population of cased, unplugged, non-producing Kansas wellbores. Under Kansas regulation a well must be plugged or granted temporary abandonment status within 90 days after operations cease, with a well legally considered abandoned after 90 days for wells not fully equipped for immediate service and 365 days for fully equipped wells.[27] Wells in or near that status are the cheapest possible entry point to a stacked section — provided the buyer prices the plugging liability correctly, which Section 7 addresses.

3.3 County-level screening

County data reveal the geographic structure of the opportunity: several counties combine very large wellbore counts with per-well rates far below the state average, while a smaller group of western counties carries high per-well rates that indicate better-quality reservoir and better completion practice.

County	2025 oil production (bbl)	Producing oil wells	bbl/d per well	Screening implication
Woodson	333,300	3,805	0.24	Very high well density, very low rate — dense shallow Cherokee/Marmaton wellbore inventory
Allen	246,076	2,503	0.27	Same profile; eastern Kansas shallow section

[26] Kansas Geological Survey, "Well Statistics", online database summary.
[27] Kansas Corporation Commission, "Questions and Answers on Abandoned Wells".

County	2025 oil production (bbl)	Producing oil wells	bbl/d per well	Screening implication
Miami	160,400	2,501	0.18	Same profile
Franklin	105,302	2,091	0.14	Same profile
Coffey	157,001	1,581	0.27	Same profile
Ellis	1,984,976	2,417	2.25	Large inventory at above-average rate — Central Kansas uplift core
Russell	1,219,664	1,753	1.91	Central Kansas uplift, Arbuckle plus Pennsylvanian stack
Rooks	1,234,425	1,548	2.18	Central Kansas uplift
Barton	1,353,497	1,799	2.06	Central Kansas uplift, historically the deepest multi-pay stack
Ness	1,060,067	1,130	2.57	Mississippian and Pennsylvanian stack
Stafford	848,221	1,077	2.16	Central Kansas uplift flank
Cowley	479,192	697	1.88	Nemaha uplift, Marmaton and Arbuckle
Butler	708,939	1,175	1.65	Nemaha uplift, El Dorado / Augusta legacy area
Haskell	1,822,410	446	11.20	Highest rate per well in the state — deeper, better-completed wells
Finney	1,498,647	553	7.42	Second-highest rate per well

Source: Kansas Statistical Abstract / Kansas Geological Survey[28].

Two distinct acquisition strategies follow from this table. In the eastern shallow counties — Woodson, Allen, Miami, Franklin, Coffey — wellbores are cheap, numerous, and shallow, so recompletion cost per well is at the low end of the range and the target zones are the Cherokee, Marmaton, and Pennsylvanian sands, but per-well upside is limited by thin pay. In the Central Kansas uplift counties — Ellis, Russell, Rooks, Barton, Stafford, Ness — wellbores are deeper and more expensive to work, but they penetrate the full Arbuckle-through-Lansing–Kansas City stack, which is where the multi-zone upside concentrates. The uplift counties are the higher-value

[28] University of Kansas, Institute for Policy and Social Research, *Kansas Statistical Abstract*.

target for a stacked-pay recompletion program; the eastern counties are the higher-volume, lower-ticket target.

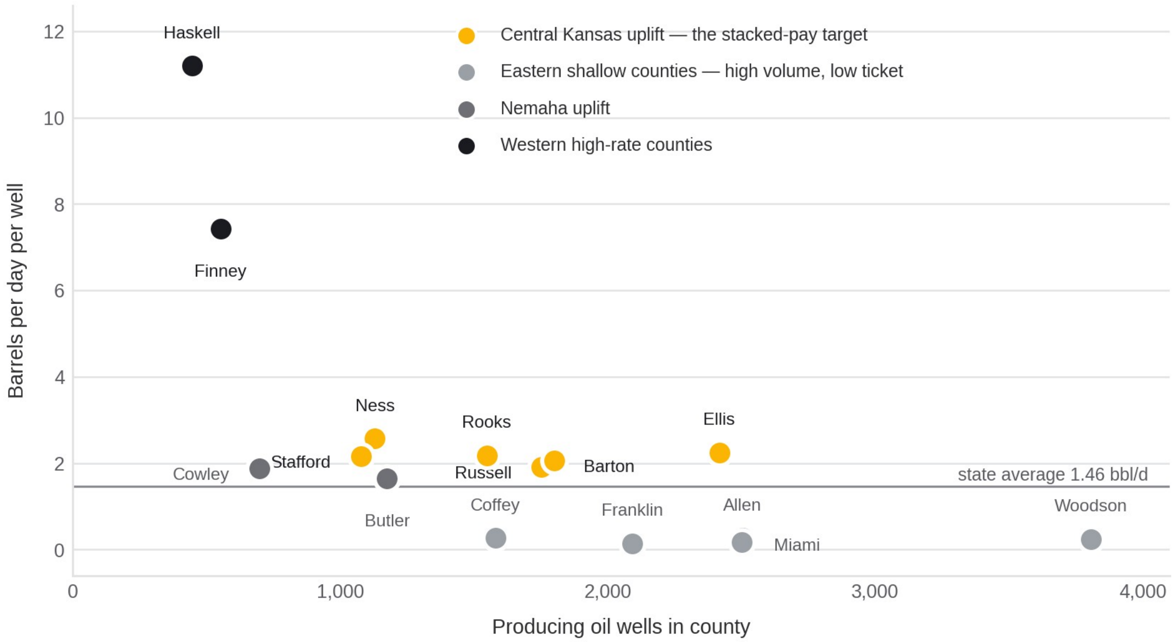


FIGURE 3 County screen: wellbore count against per-well rate. The eastern shallow counties carry large, cheap wellbore inventories at very low rates; the Central Kansas uplift counties combine substantial inventory with above-average rates and the full Arbuckle-through-Lansing–Kansas City stack. Data: Kansas Statistical Abstract / Kansas Geological Survey, 2025.

4 WHY THE REVENUE IS BEING LEFT ON THE TABLE

Establishing that recoverable oil sits behind casing is necessary but not sufficient. A rational market should already have captured it. The following six structural mechanisms explain why it has not, and each one is a source of acquisition edge.

4.1 Operator capital constraints and the harvest incentive

The typical Kansas operator holds a portfolio of sub-two-barrel-per-day wells. County appraisal guidance illustrates the operating cost reality: a representative Kansas oil lease incurred monthly expenses of $2,675 per well, comprising pumping at $425, overhead at $225, lease supervision at $100, propane at $700, supplies at $125, salt-water disposal at $950, and insurance at $150.[29] At $88 per barrel wellhead and an 80% net revenue interest, that fixed cost base requires roughly 1.3 barrels per day simply to break even. An operator whose average well produces 1.46 barrels per day generates almost no free cash flow with which to fund discretionary recompletions, and every dollar spent on a workover is a dollar of liquidity risk. The rational

[29] Barber County, Kansas, *2024 Oil and Gas Appraisal Guide and Addendum*.

response for a capital-constrained operator is to harvest, defer, and avoid — which is precisely what the state's 1.4% annual reinvestment rate reflects.

4.2 Vintage completion practice and log interpretation

Most Kansas wellbores were drilled and completed decades ago with a single primary objective and vintage logging suites. Uphole zones were noted on the log and passed over — either because the primary target was economic on its own, because the uphole zone appeared wet or tight on the logs available at the time, or because there was no incentive to spend money proving up a secondary zone while the primary flowed.

Oomoldic and vuggy carbonate pore systems are precisely the lithologies most likely to be misread by vintage resistivity-porosity interpretation. The mechanism is documented outside Kansas as well: quantitative identification of bypassed pay zones requires "a better understanding of various pore geometries found in the reservoir and their effect on saturation distribution and the type of fluid production," integrating rock-type models with relative permeability.[30] Low-resistivity, low-contrast pay in particular produces log signatures indistinguishable from wet zones under vintage cutoffs, and reviews of older dry holes and undeveloped fields have found that "many of the abandoned wells have significant potential for bypassed pay or undeveloped reserves" specifically because of low-resistivity, low-contrast intervals.[31]

4.3 Documented operational causes of remaining oil in place

The Kansas Geological Survey's own evaluation framework enumerates the operational heterogeneities that leave significant remaining oil in place: inadequate drainage due to excessive well spacing, openhole and partial completions, bypassed attic oil, thin pays, and water coning. It notes that attic oil commonly results when well spacing or lease boundaries coincide with the structural axis of a pay zone.[32]

"Openhole and partial completions" is the operative phrase. An openhole completion in a heterogeneous carbonate produces preferentially from the highest-permeability streak and leaves stratified flow units above and below it uncontacted. A partial completion perforates a subset of net pay. Both conditions are remediable within the existing wellbore, and both are widespread in Kansas because openhole and selective completion were standard practice through much of the state's development history.

[30] West Texas Geological Society, [Quantitative identification of bypassed pay in carbonate reservoirs], Other Publications 097, paper 102, via AAPG Datapages.
[31] Sneider Exploration, [Technical paper on bypassed pay and low-resistivity, low-contrast reservoirs].
[32] Kansas Geological Survey, *Open-File Report 99-22*.

4.4 Tax and appraisal treatment discourages disclosure of upside

Kansas county appraisal practice expressly excludes recompletion from allowable operating expense: "Re-completion into a different producing zone" is listed among operating expenses not allowed, alongside new well drilling and new or replaced equipment.[33] Because a successful recompletion raises a lease's appraised production and therefore its ad valorem tax base without the cost being recognized as deductible lease expense in the appraisal formula, a small operator faces an immediate, visible tax consequence against an uncertain production benefit. This is a real behavioral deterrent at the margin, and it depresses the frequency of recompletions below the level that pure reservoir economics would support.

4.5 Lack of reservoir characterization at the small-operator level

Identifying a behind-pipe target requires log analysis, volumetric calculation, and mapping — capabilities that a two-person operating company running forty stripper wells generally does not have. The Kansas Geological Survey built tools expressly to close this gap, including the PfEFFER low-cost integrated log-analysis package for identifying flow units and their petrophysical and reservoir properties, and the Digital Petroleum Atlas providing internet access to basic production, geologic, and engineering data.[34] The Survey also developed web-based intelligent-agent methods for locating pay zones in digital well log files.[35] The tools exist and the data are public. The analytical capacity to use them at scale does not exist inside most operating companies — which is exactly the arbitrage an acquirer with technical capability can exploit.

4.6 The plugging-liability clock forces exits at the wrong time

Kansas requires each operator to demonstrate financial responsibility annually, with one option being an individual performance bond or letter of credit equal to $0.75 times the total aggregate depth of all wells, including active, inactive, injection, and disposal wells.[36] Combined with the 90-day and 365-day abandonment triggers, an operator whose well drops below economic rate faces a compressed decision window: plug it, obtain temporary abandonment status, or transfer it. Under liquidity pressure the frequent outcome is transfer or abandonment rather than a $60,000 recompletion — even when the recompletion has the higher expected value. The state's abandoned-well database held 4,566 wells requiring action as of the 2025 legislative report, against 11,315 wells plugged with state funds since the funds' creation in 1996.[37] Those transfer and abandonment events are the origin of the acquisition pipeline.

[33] Barber County, Kansas, *2024 Oil and Gas Appraisal Guide*.
[34] Kansas Geological Survey, *Open-File Report 99-22*; U.S. Geological Survey, “Kansas Geological Survey's Digital Petroleum Atlas (DPA) Project”.
[35] Kansas Geological Survey, [Open-file reports and web publications index].
[36] Kansas Legislature, *House Bill 2022*, 2021–22 session.
[37] Kansas Corporation Commission, *2025 Abandoned Oil and Gas Well Status*, report to the Legislature.

5 ECONOMICS: RECOMPLETION VERSUS NEW DRILLING

5.1 Capital cost benchmarks

The cost asymmetry is the core of the argument, and Kansas-specific benchmarks are available.

Item	Cost	Source
Drill and equip a producing 3,500–4,500 ft Kansas well	approximately $450,000	38
Dry hole, 3,500–4,500 ft Kansas	approximately $180,000	39
Average Kansas well depth	approximately 3,500 ft (under 1,000 ft in southeastern Kansas; to 8,000 ft in western Kansas)	40
Uncompleted well, Kansas, drilled and tested	$200,000–$300,000; completed well roughly twice that	41
Replacement cost of existing wells if drilled today (operator estimate)	$250,000–$350,000 per well	42
Gel polymer conformance treatment, Kansas Arbuckle wells	$45,000 per job	43
Recompletions and workovers targeting additional pay zones in existing wellbores, general industry range	$50,000–$300,000	44
Routine workover interventions (tubing, rod, pump, zone isolation)	$15,000–$40,000	45
Benchmark wireline and perforating services market price, 2026	approximately $29,630 per job	46
Workover or completion rig time, regional independent contractor	$340 per hour rig time; $100 per day for blowout preventers	47

The general workover-versus-infill comparison in the technical literature places workover capital cost at $100,000 to $2 million against $1 million to $15 million for a new infill well.[48] In shallow Kansas, both ends of that comparison scale down by roughly an order of magnitude, but the ratio holds.

[38] Kansas Independent Oil and Gas Association, [Securities brochure].
[39] Kansas Independent Oil and Gas Association, [Securities brochure].
[40] Kansas Independent Oil and Gas Association, [Securities brochure].
[41] The Wichita Eagle, [News report on Kansas well drilling and completion costs].
[42] Total Team Petroleum, *Business plan, revision 2.4*, operator estimate (industry pricing reference).
[43] Kansas Geological Survey, “PTTC case studies: gel polymer treatments, individual wells”.
[44] Bass Exploration, “Oil Well Costs: What Investors Actually Pay For” (industry pricing reference).
[45] Kingdom Exploration, “Oil Well Workover Costs”, frequently asked questions (industry pricing reference).
[46] IBISWorld, *Wireline and Perforating Services*, procurement research report.
[47] WT Drilling, “Rates”, published rate card (industry pricing reference).
[48] PetroSmart Academy, “Workover Operations in Petroleum” (industry pricing reference).

A defensible Kansas cost stack for a plug-back-and-perforate in a 3,000-to-4,500-foot cased hole is therefore: rig time of three to five days at roughly $3,000 to $4,000 per day, a cement or mechanical plug at $8,000 to $15,000, wireline logging and perforating at $15,000 to $30,000, acid or nitrogen stimulation at $10,000 to $25,000, and pump, rod, and tubing changes plus fluid handling at $10,000 to $20,000 — a total of roughly $55,000 to $110,000, with simple add-perforation jobs at the low end near $35,000 and complex multi-zone or stimulated recompletions at the high end near $135,000.

5.2 Operating cost structure and the incremental-cost advantage

The decisive and frequently overlooked economic point is that a recompletion adds revenue on top of an existing fixed cost base, whereas a new well must carry an entire fixed cost base of its own.

Kansas county appraisal guides publish annual discounted operator expense allowances per well by depth and water cut, which serve as the best available public proxy for Kansas lease operating costs:

Average well depth	Under 90% water	90%–95% water	Over 95% water
501–1,000 ft	$19,120	$21,990	$25,285
1,501–2,000 ft	$24,120	$27,740	$31,900
2,001–3,000 ft	$46,930	$53,970	$62,065
3,001–4,000 ft	$67,045	$77,100	$88,665
4,001–6,000 ft	$77,470	$89,090	$102,455
6,001+ ft	$112,680	$129,585	$149,020

Source: Barber County, Kansas, 2024 Oil and Gas Appraisal Guide, Table I[49].

A new 3,001-to-4,000-foot well must absorb $67,045 to $88,665 per year of operating cost before it earns anything. A recompletion in a well that is already pumping, already has a lease road, tank battery, electricity, and disposal arrangement, and already carries that cost adds only incremental operating cost — additional fluid handling, chemicals, occasional pump changes, and a marginally larger disposal volume. Modeling that increment at $9,000 to $18,000 per year is conservative. The recompletion therefore enjoys roughly $50,000 to $70,000 per year of operating cost advantage over an equivalent new well before a single barrel of production difference is considered.

[49] Barber County, Kansas, *2024 Oil and Gas Appraisal Guide*.

5.3 The Kansas severance tax exemption

Kansas imposes an 8% severance tax on the gross value of oil, against which a taxpayer liable for ad valorem property taxes on oil property may credit 3.67% of gross value, producing an effective rate of roughly 4.33%.[50]

The statute then creates a targeted exemption of direct relevance. "The incremental severance and production of oil or gas resulting from a production enhancement project begun on or after July 1, 1998, is exempt for seven years from the project's start-up date." Qualifying production enhancement projects expressly include "a workover," "recompletion to a different producing zone in the same well bore, except recompletions in formations and zones subject to a state corporation commission proration order," secondary recovery projects, addition of mechanical devices to dewater a well, replacement or enhancement of surface equipment, and installation or enhancement of compression equipment. Incremental production is calculated by subtracting base production — the average monthly production for the 12 months before the project, less the extrapolated monthly decline rate — from total monthly production after the project, and the operator evidences the base calculation by affidavit filed with the Corporation Commission. Critically, a well that produced during the prior 12 months but "is not capable of production on the project beginning date has base production equal to zero."

Three practical implications follow. First, incremental barrels from a plug-back are severance-tax-free for seven years, while every barrel from a new well is taxed from day one. Second, because base production is defined net of extrapolated decline, the exemption grows over time as the declining baseline is subtracted. Third, a well that has ceased to be capable of production carries a base of zero, meaning a recompletion in a shut-in or mechanically failed well can qualify its entire post-project volume as exempt — a strong argument for acquiring idle wellbores rather than currently producing ones.

5.4 Comparative project economics

The model below compares recompletion and new-drill scenarios on identical price, royalty, tax, and discounting assumptions.

Assumptions. Wellhead price of $88 per barrel, reflecting a WTI spot price of $97.26 per barrel on September 9, 2026[51] less a common-grade and trucking differential, since Kansas common crude sells at a discount to the WTI benchmark because of postings and transport costs.[52] Net revenue interest of 80% after a typical royalty burden. Severance tax of 4.33% effective, waived for seven years on recompletion

[50] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[51] U.S. Energy Information Administration, “Cushing, Oklahoma WTI Spot Price FOB”, series RWTCD.
[52] Buckhead Energy, “Kansas Stripper Wells and Small Royalty Checks” (industry pricing reference).

volumes per the statute. Exponential decline. Fifteen-year evaluation life. Discount rate of 10%. New-well capital of $450,000 per KIOGA, and a risked case adding dry-hole cost at a 70% success rate.

Scenario	Capital	Initial rate (bbl/d)	15-yr volume (bbl)	Capital per bbl/d	Capital per bbl	NPV at 10%	Payout
Add-perforation / re-perforation of existing zone	$35,000	5	5,187	$7,000	$6.75	$204,000	4 months
Uphole recompletion — low case	$55,000	8	9,625	$6,875	$5.71	$389,000	4 months
Uphole recompletion — base case	$85,000	15	19,260	$5,667	$4.41	$837,000	3 months
Uphole recompletion — high case	$135,000	25	35,642	$5,400	$3.79	$1,560,000	3 months
New infill well, 3,500–4,500 ft	$450,000	30	33,937	$15,000	$13.26	$782,000	10 months
New infill well, risked for dry holes	$527,000	30	33,937	$17,567	$15.53	$705,000	11 months

The base-case recompletion generates a higher net present value than a new infill well at less than one-fifth the capital, and roughly one-third the capital intensity per barrel per day. On a per-barrel basis, the recompletion adds reserves at $3.79 to $6.75 of capital per barrel against $13.26 to $15.53 for the new well. That range is consistent with the only published Kansas figure of its kind: gelled-polymer conformance treatments in Kansas Arbuckle wells were reported to add oil reserves at $2 to $5 per barrel.[53]

[53] Kansas Geological Survey, PTTC gel polymer case studies.

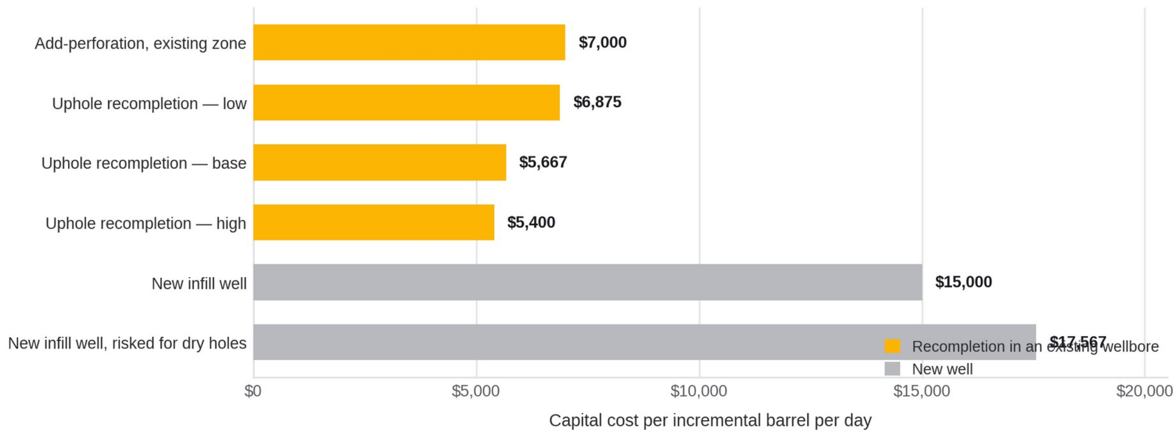


FIGURE 4 Capital cost per incremental barrel per day. Every recompletion case clears its capital at roughly a third of the intensity of a new infill well, before the operating-cost and severance-tax advantages are counted.

The payout figures deserve a caveat. Three-to-four-month payouts reflect an unusually strong $88 wellhead price environment; the same base case at a $55 wellhead price pays out in roughly eight months, and the model's short payouts are a function of high current prices rather than of an implausibly optimistic production assumption.

5.5 The break-even threshold and why it matters

The single most important number in the analysis is the incremental rate at which a recompletion covers its own cost.

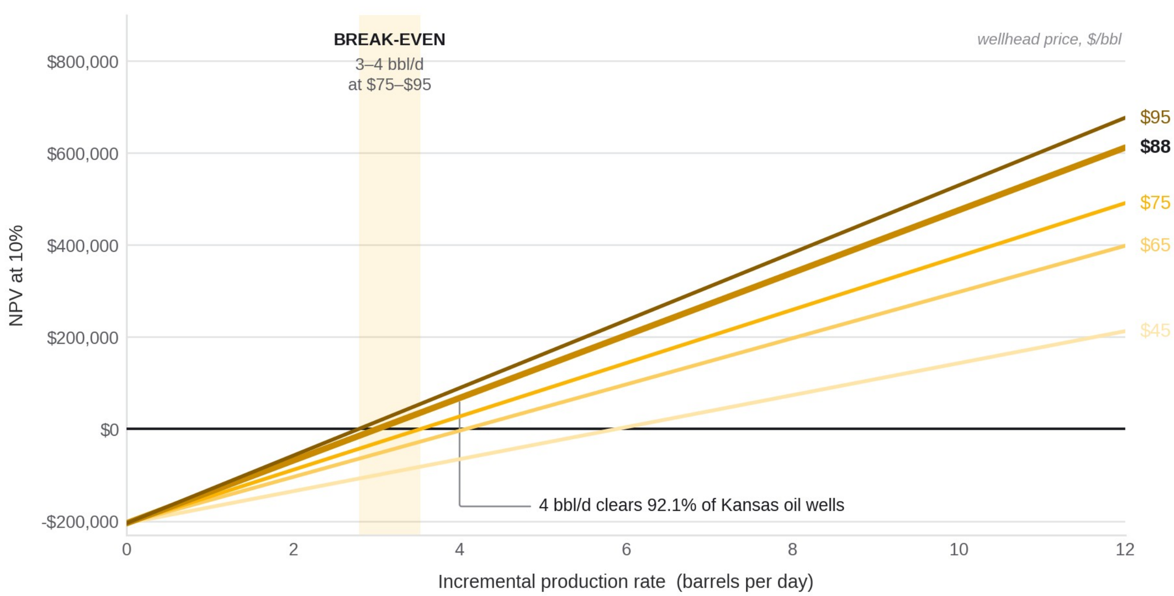


FIGURE 1 Net present value of a base-case uphole recompletion across incremental rate and oil price. Assumes $85,000 capital, 80% net revenue interest, 28% exponential decline, $15,000 a year of incremental operating cost, severance tax waived, 15-year life, discounted at 10%.

At an $85,000 recompletion cost and a $75 to $95 wellhead price, the break-even incremental rate is approximately three to four barrels per day. Above five barrels per day the project is unambiguously value-creating across the entire price range examined, including $45 per barrel. Below two barrels per day it destroys value at any price.

Set that threshold against the state's production distribution. A four-barrel-per-day incremental rate would, on its own, place a well above 92.1% of all producing oil wells in Kansas. A recompletion program does not need to find good wells by Permian or Bakken standards; it needs to find zones capable of four barrels per day in a state where 29,127 wells — 61.07% of every producing oil well in Kansas — produce less than one.

5.6 Risk-weighting the program

Recompletions fail. Zones prove wet, cement plugs fail to isolate, stimulation does not restore permeability, and mechanical problems consume budget. A defensible program-level assumption is a 50% to 65% technical success rate on a well-screened portfolio, based on the general observation that a workover decision is fundamentally an expected-value calculation weighing incremental production against workover cost and probability of success.[54]

At a 55% success rate, ten base-case recompletions cost $850,000 and produce five and a half successes worth roughly $837,000 of net present value each on a gross basis, or approximately $4.6 million against $850,000 of capital — a program-level multiple that remains strongly positive. The equivalent risked new-drill program at 70% geological success produces $705,000 of net present value per $527,000 of risked capital. The recompletion program tolerates a far worse success rate before the two converge, because each failure costs $85,000 rather than $450,000. **Low cost per attempt, not high success rate, is the source of the advantage.**

6 FIELD EVIDENCE FROM KANSAS

Four documented Kansas programs support the thesis with observed rather than modeled results.

6.1 Donelson West field, Cowley County — recompletion of a 40-year-old field

Donelson West field covers about 1,200 acres in Cowley County and produces from the Altamont limestone in the upper Marmaton Group, a fine crystalline limestone

[54] PetroSmart Academy, “Workover Operations in Petroleum” (industry pricing reference).

with pinpoint and vugular porosity of 15% to 20%, permeability of 1 to 10 millidarcies, and net pay of 6 to 10 feet. Original oil in place was 2.7 million barrels, and cumulative production through 2011 was about 0.45 million barrels, or roughly 17% of oil in place, leaving 2.2 million barrels in the ground. The field had never had pressure support, and was originally developed with vertical completions later treated with acid and nitrogen fracturing.[55]

The production history is a textbook picture of harvest-mode neglect. The field produced 83,000 barrels from 13 wells in 1968; from 2000 through 2009 it averaged 1,033 barrels per year. In the three years before the workover program the field averaged about 157 barrels per month, and normalized per well, average production was 16 barrels per month per well — roughly half a barrel per day.

After acquiring 320 acres in late 2010, the operator's initial redevelopment phase was to recomplete and stimulate eight existing wells and drill only two new wells, on 10-acre spacing, using radial jet drilling to place four 600-foot laterals per well followed by stimulation with 15,000 gallons of acid and nitrogen per well. Seven of the eight existing wells returned to production; one well in the western part of the field, where the formation thins, never came back online.

Two points are essential. First, the operator's plan was eight recompletions to two new wells — a four-to-one weighting toward existing wellbores. Second, the field had recovered only 17% of its oil in place after 44 years of production, in a reservoir the operator believed capable of 35% recovery.

6.2 Schaben field, Ness County — reservoir characterization directing intervention

Schaben field, on the northeastern shelf of the Hugoton embayment, produces from partially dolomitized Mississippian shelf carbonates in erosional highs beneath a regional unconformity at depths around 4,400 feet.[56] A Department of Energy reservoir characterization and simulation study directed 22 infill locations that were drilled or recompleted between late 1996 and 1998, with reported initial rates spanning 13 to 108 barrels of oil per day. The demonstration site achieved incremental production increases of about 200 barrels of oil per day "from a smaller number of wells" than would otherwise have been required, and all major operators at Schaben adopted the reservoir management strategy to locate additional locations.[57]

The phrase "from a smaller number of wells" is the operative finding: characterization substituted for well count. That is the same substitution a recompletion program makes.

[55] Oil & Gas Journal, “RJD Revitalizes Mature Kansas Oilfield”.
[56] U.S. Geological Survey, *Publication 70022538*.
[57] U.S. Department of Energy, *Technical report, OSTI 824383*.

6.3 Arbuckle conformance treatments — measured cost per incremental barrel

Kansas Arbuckle wells that had become marginal or uneconomic because of water handling were treated with gelled polymers to reduce water production. The published case-study economics are unusually specific: a $45,000 job cost, approximately 18 barrels of oil per day of incremental recovery sustained for six months, payout in three to six months at a $22 per barrel oil price, an average payout of 6.1 months or 7.2 months when calculated on incremental oil alone excluding water-handling savings, and a resulting cost to add reserves of $2 to $5 per barrel. Cumulative incremental production from the program was credited with adding $45,939,600 to the Kansas state economy since 2001.[58]

This is the strongest single Kansas data point in the paper, because it demonstrates that in-wellbore intervention paid out in months at a $22 oil price. At four times that oil price, the margin for error on rate, decline, and success probability is far wider than any responsible model would assume.

6.4 Lansing–Kansas City plug-backs — the operation itself, documented

The Department of Energy Lansing–Kansas City project referenced in Section 1.2 provides the operational template with dated specifics: CO2#12's workover on March 6, 2003 plugged back the Lansing–Kansas City G zone with cement, cemented a 4½-inch welded liner to surface across shallow zones, left only the Lansing–Kansas City C zone open, and obtained new wireline logs; CO2#10's workover from March 5 to 10, 2003 drilled out a cement plug to approximately 2,925 feet, perforated the Lansing–Kansas City C zone from 2,898 to 2,910 feet, ran a dual packer assembly across the Topeka and Plattsmouth perforations, and acidized.[59] Each operation took less than a week.

The project also documented that the same wellbores intersected multiple named zones — Lansing–Kansas City C and G, Topeka, Plattsmouth, Plattsburg — within a few hundred feet of section. That vertical density of named, mappable, individually completable intervals in a single Kansas wellbore is the physical basis of this paper's argument.

6.5 Hillsboro field, Marion County — the state's own thesis

The Kansas Geological Survey's project proposal for Hillsboro field states the objective in terms nearly identical to the argument advanced here: apply cost-effective technologies to existing wells, recomplete the Penner #12 production well with radial-jetted laterals in the Viola Formation, and raise production from 10 barrels of oil per day at 97% water cut to approximately 40 barrels of oil per day —

[58] Kansas Geological Survey, PTTC gel polymer case studies.
[59] National Energy Technology Laboratory, *DE-FC26-04NT15124 final report*.

roughly 10,950 incremental barrels per year — while explicitly noting that the project "will not require drilling additional wells".[60] The state geological survey designed a demonstration project whose central premise was that more wells do not need to be drilled to extract additional value.

7 ACQUISITION STRATEGY AND EXECUTION FRAMEWORK

7.1 What to buy

The target is not production. It is penetrated section per dollar of purchase price. Screening criteria, in priority order:

1. **Wellbore depth relative to the local pay stack.** The well should be drilled to or near the deepest local objective — Arbuckle on the Central Kansas uplift, Mississippian on the Hugoton embayment shelf, Cherokee or Marmaton in eastern Kansas — so that the full overlying section is behind casing.
2. **Casing set and cemented through the target zones.** A cased hole with competent cement across the uphole objectives is the asset. An openhole completion below casing is workable; a well with casing set only to the top of the primary objective is not.
3. **Current production from the deepest zone, ideally with high water cut.** High water cut in the bottom zone is a buy signal, not a warning: it means the deep zone is near the end of its economic life, so plugging it back sacrifices little, and the seller's valuation reflects that impairment.
4. **Location within a multi-zone trend.** The Central Kansas uplift, Pratt anticline, and Nemaha uplift near Butler and Cowley counties carry the highest counts of locally productive zones.[61]
5. **Recovery efficiency below the local norm.** Cumulative production per quarter section divided by calculated oil in place is the Survey's own screening metric; regions with low recovery efficiency "are considered most likely to yield additional or incremental hydrocarbon reserves".[62]
6. **Manageable plugging liability.** Kansas' state plugging program plugged 2,407 wells at a total cost of $24,615,689 as of September 30, 2024, an average of approximately $10,200 per well.[63] Kansas plugging costs are therefore roughly an order of magnitude below the $76,000 national median for orphaned

[60] Kansas Geological Survey, [Hillsboro field project proposal].
[61] Kansas Geological Survey, *Subsurface Geology Series 9*, page 3.
[62] Kansas Geological Survey, *Open-File Report 99-22*.
[63] Kansas Corporation Commission, *Abandoned Well Plugging Update*.

wells,[64] which makes the terminal liability on shallow Kansas wells a modest and quantifiable line item rather than a deal-breaker.

7.2 Pricing discipline

Kansas stripper production is typically valued on income multiples. Producing Central Kansas Uplift minerals are described as worth 36 to 72 times the average monthly royalty check, with seasoned low-decline stripper wells landing in that range because shallow decline curves make small checks durable.[65] Working-interest transactions in stripper wells commonly transact at 15 to 20 times monthly cash flow.

The strategic point is that these multiples price the currently perforated zone only. A wellbore purchased at 18 times monthly cash flow on a 1.5-barrel-per-day producing zone is being valued at roughly $65,000 to $75,000 including equipment, while the behind-pipe section it penetrates is assigned no value in the price. County appraisal guidance underscores this: a well capable of producing but never produced carries a minimum working-interest reserve value of only $50,000 in the 2,001-to-4,000-foot depth range and $75,000 above 4,000 feet.[66] Undeveloped and untested capacity is systematically assigned negligible value in the Kansas market, and that mispricing is the return.

7.3 Technical diligence checklist

Item	Source	What it establishes
Well logs for the subject well and all wells within one mile	[67]	Which zones were penetrated, their thickness, porosity, and log character
Completion reports and ACO-1 filings	Filed with the Conservation Division within 120 days of spud, recompletion, workover, or conversion[68]	Which zones were actually perforated, and prior intervention history
Lease-level production history by well	[69]; production data through May 2026 in the KGS databases[70]	Decline behavior, base production for the severance exemption affidavit, prior response to intervention
Drill-stem test and mud-log shows in uphole intervals	Well files and samples; operators must preserve and retain samples when drilling or recompleting[71]	Direct evidence of hydrocarbons in an unperforated zone — the highest-value single data point
Quick-look volumetrics and recovery efficiency by quarter section	KGS methodology using pay height, porosity, and saturation from one well per quarter section[72]	Whether the local oil in place is materially under-recovered

64 Resources for the Future, “New Study Reveals Key Factors for Estimating Costs to Plug Abandoned Oil and Gas Wells”, press release.
65 Ironwood Royalty, “Central Kansas Uplift”, mineral valuation commentary (industry pricing reference).
66 Barber County, Kansas, *2024 Oil and Gas Appraisal Guide*.
67 Kansas Corporation Commission, “Oil and Gas Data Search”, well and log records; Kansas Geological Survey, “Oil and Gas Databases”.
68 Kansas Corporation Commission, *Form ACO-1, well completion and recompletion report*, reproduced in Kansas Geological Survey Open-File Report 2004-37.
69 Kansas Geological Survey, “Production by Operator”, Magellan query tool.
70 Kansas Geological Survey, Oil and Gas Databases.
71 Kansas Corporation Commission, *General Rules and Regulations*.
72 Kansas Geological Survey, *Open-File Report 99-22*.

Item	Source	What it establishes
Casing and cement records; casing integrity	Completion reports; casing regulations under K.A.R. 82-3-106[73]	Whether the wellbore can mechanically support a plug-back and a new completion
Abandoned-well and orphan-well status	[74]	Whether liability is attaching to the wellbore or its predecessor operator
Operator licensing, bonding, and financial-responsibility position	Bond equal to $0.75 times aggregate well depth[75]	Cost of taking over operations

7.4 Regulatory and filing path

Requirement	Rule	Practical effect
Completion affidavit after recompletion	Filed within 120 days of commencement of recompletion[76]	Routine; a filing task, not an approval gate
Commingling production from more than one source of supply	Permitted after application and approval by the Conservation Division if total production potential is less than the allowable for a single common source of supply in the immediate area[77]	Enables single-string production from two zones; the allowable test is not binding for stripper rates
Dual or multiple completion	Governed by K.A.R. 82-3-124; a multiple completion permits production from two or more common sources of supply completely separated[78]	Alternative to commingling where zones must be kept separate
Temporary abandonment	Within 90 days after operations cease, plug the well or obtain temporary abandonment approval[79]	Governs how long an acquired idle wellbore can be held before work must begin
Severance tax exemption on incremental production	Seven-year exemption for workovers and recompletion to a different producing zone in the same well bore; base production evidenced by affidavit and supporting documentation filed with the Corporation Commission[80]	Requires disciplined pre-project production documentation — establish the 12-month base and decline rate before the rig moves in
Proration-order exclusion	Recompletions in formations and zones subject to a Corporation Commission proration order do not qualify for the exemption[81]	Screen out prorated zones, principally in the Hugoton and Panoma gas areas[82]

The single most important execution discipline is documenting base production for twelve months before the project, with the extrapolated decline rate, in order to secure the seven-year severance exemption. That documentation must exist before the workover, not after.

[73] Kansas Corporation Commission, *General Rules and Regulations*.
[74] Kansas Corporation Commission, *2025 Abandoned Well Status report*.
[75] Kansas Legislature, *House Bill 2022*.
[76] Kansas Administrative Regulations, *K.A.R. 82-3-130*, via Cornell Legal Information Institute.
[77] Kansas Corporation Commission, *General Rules and Regulations*.
[78] Kansas Corporation Commission, *General Rules and Regulations*.
[79] Kansas Administrative Regulations, *K.A.R. 82-3-111*, via Cornell Legal Information Institute.
[80] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[81] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[82] Kansas Corporation Commission, “Hugoton and Panoma Field Data”.

7.5 Program sequencing

A rational program proceeds in five stages: (1) screen counties and trends using public KGS production and log data, targeting quarter sections with low recovery efficiency inside multi-zone trends; (2) acquire a cluster of wellbores within one operating area, so that rig mobilization, disposal, and field labor amortize across many wells; (3) pilot three to five recompletions and measure actual rate, decline, and cost against the model; (4) recalibrate the screen using pilot results, tightening the log criteria that separated successes from failures; (5) scale within the calibrated trend. Geographic clustering matters more than it appears — at $3,000 to $4,000 per rig day, mobilization and idle time between scattered wells can consume 20% of a $85,000 budget.

8 THE STATEWIDE PRIZE

8.1 The barrels at stake

Scaling the well-level economics across the state quantifies the revenue being left on the table.

Scenario	Share of wells with a viable behind-pipe target	Incremental recoverable per well (bbl)	Wells	Incremental barrels	Net wellhead revenue at $88, 80% NRI	Recompletion capital at $85,000 per well	Multiple of current annual state output
Conservative	8%	6,000	3,800	22.8 million	$1.6 billion	$323 million	0.9x
Base	15%	10,000	7,124	71.2 million	$5.0 billion	$606 million	2.8x
Upside	25%	15,000	11,874	178.1 million	$12.5 billion	$1.0 billion	7.0x

Sources: producing-well count of 47,494 and 2025 production of 25,398,168 barrels from Kansas Statistical Abstract / Kansas Geological Survey[83]; scenario construction by the author.

These scenarios are deliberately modest against the geological record. The base case assumes that only 15% of Kansas oil wells carry a viable behind-pipe target, in a state where all major fields have multiple pay zones and up to twelve zones can be productive at a locality. It assumes 10,000 incremental barrels per successful well, which corresponds to roughly eight barrels per day declining at 28% — a rate that would place the well above 96% of Kansas oil wells but is trivial against a reservoir class that recovers under 25% of its oil in place. And it applies a $85,000

[83] University of Kansas, Institute for Policy and Social Research, *Kansas Statistical Abstract*.

recompletion cost across the board, which overstates cost in the shallow eastern counties where wells are under 1,000 feet deep.

For context, the base-case figure of 71.2 million barrels represents about 0.15% of the more than 48 billion barrels the Department of Energy identified as remaining at risk of abandonment in Class II shallow-shelf carbonate reservoirs nationally.[84] Capturing a fraction of one percent of that at-risk resource inside a single state, using existing wellbores, is not an aggressive assumption.

The comparison to the drilling alternative closes the argument. To produce 71.2 million barrels by drilling, at 33,937 barrels of fifteen-year recovery per new well, would require roughly 2,100 new wells at $450,000 each — approximately $945 million of capital, before dry-hole risk, and about three years of the state's entire permitting and drilling capacity at recent rates of roughly 650 new oil wells per year.[85] Recompleting existing wellbores captures the same volume for roughly $606 million, adds no new surface locations, adds no new plugging liabilities, and can be executed with workover rigs that are already in the state.

8.2 The public revenue at stake

The case for recompletion is normally made to operators and to capital. It should also be made to the state, because Kansas' oil tax base is a direct function of the production rate of the same 47,494 wellbores.

Kansas levies an 8% severance tax on the gross value of oil, against which a producer liable for ad valorem property taxes credits 3.67% of gross value, so the combined state and local burden on Kansas crude is approximately 8% of wellhead value — roughly 4.33% to the state and 3.67% to the counties.[86] At the $88 wellhead price used throughout this paper, 2025 production of 25,398,168 barrels carried a gross wellhead value of $2.24 billion and supported approximately $178.8 million of state and local oil tax revenue. That base is contracting at the rate the wellbore population is being harvested.

Year	Oil production (bbl)	Gross wellhead value at $88	Severance at 4.33%	Ad valorem at 3.67%	Total state and local
2023	27,697,534	$2.44 billion	$105.5 million	$89.5 million	$195.0 million
2024	26,829,707	$2.36 billion	$102.2 million	$86.6 million	$188.9 million
2025	25,398,168	$2.24 billion	$96.8 million	$82.0 million	$178.8 million

[84] U.S. Department of Energy, Office of Fossil Energy, [Techline: reservoir class program].
[85] Kansas Geological Survey, Well Statistics.
[86] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.

Year	Oil production (bbl)	Gross wellhead value at $88	Severance at 4.33%	Ad valorem at 3.67%	Total state and local
2030 (projected)	20,450,579	$1.80 billion	$77.9 million	$66.1 million	$144.0 million
2035 (projected)	16,466,786	$1.45 billion	$62.7 million	$53.2 million	$115.9 million

Sources: production from Kansas Statistical Abstract / Kansas Geological Survey[87]; tax rates from Kansas Department of Revenue[88]. Projections apply the 4.24% compound annual decline implied by 2023–2025 state data at a constant $88 wellhead price, and are scale indicators rather than forecasts.

Holding price constant, that decline carries Kansas oil production to roughly 16.5 million barrels by 2035 and annual state and local oil tax revenue to approximately $115.9 million — $62.9 million a year below the 2025 level. Cumulatively across the decade the state and its counties forgo on the order of $368 million relative to simply holding 2025 production flat. No price collapse is assumed to produce that result; it follows from a well population declining at 4% a year against a 1.4% annual reinvestment rate.

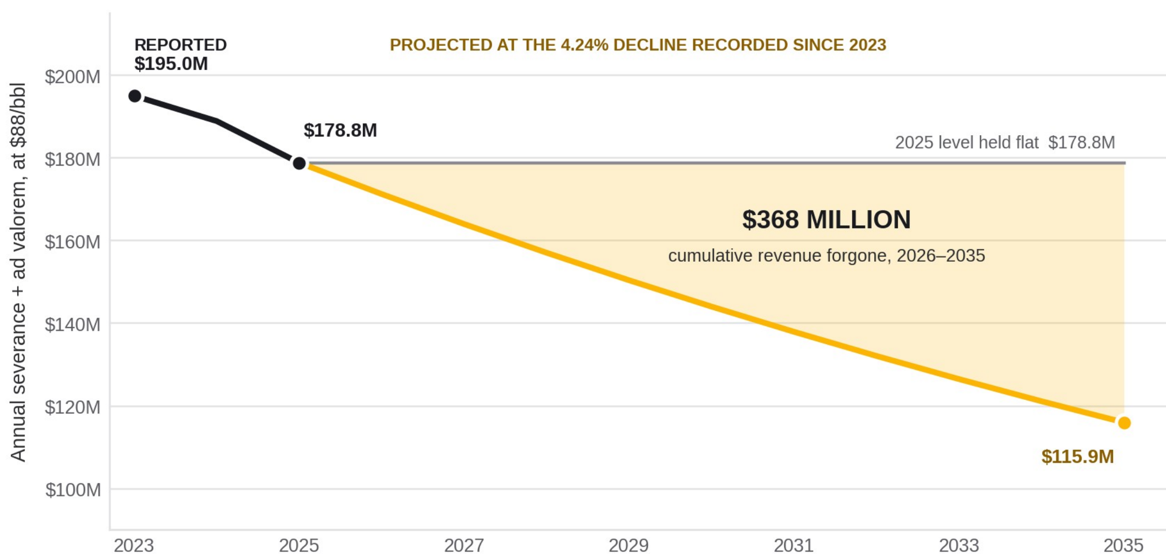


FIGURE 5 Kansas state and local oil tax revenue at a constant $88 wellhead price. The shaded wedge is the cumulative revenue forgone between the recorded decline and simply holding 2025 production flat. Data: Kansas Statistical Abstract; Kansas Department of Revenue.

The exposure is concentrated in precisely the wells this paper argues should be recompleted. The 29,127 Kansas oil wells producing less than one barrel per day — 61.07% of every producing oil well in the state — together produce 3.0 million barrels a year and carry roughly $21.2 million of annual state and local tax revenue.[89] Against the $2,675 per well per month operating cost documented in Section 4.1, essentially all of them sit at or below their own breakeven. When such a well is plugged rather than recompleted, three things happen at once: the production stops, the tax revenue

[87] University of Kansas, Institute for Policy and Social Research, *Kansas Statistical Abstract*.
[88] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[89] U.S. Energy Information Administration, *Distribution of Wells by Production Rate*.

stops permanently, and a plugging cost is incurred. Kansas' state plugging program has averaged approximately $10,227 per well;[90] applied across that 29,127-well population the terminal liability is on the order of $298 million, of which the 4,566 wells already sitting in the Commission's abandoned-well database represent about $46.7 million.[91]

Recompletion inverts all three outcomes, and the public revenue arithmetic of the base-case program is favorable even though the severance exemption is designed to forgo severance. Because roughly 87% of a 28%-decline volume is produced inside seven years, most incremental barrels fall within the holiday. Counties, however, collect ad valorem tax on the increased appraised production immediately — the same mechanism that Section 4.4 identifies as a deterrent to the operator is a benefit to the county — and severance resumes on the post-exemption tail.

Public revenue effect of the base-case program	Amount
Incremental production	71.2 million bbl
Gross wellhead value at $88	$6.27 billion
Ad valorem tax to counties, 3.67%, applies immediately	$230.1 million
Severance tax to the state, 4.33%, after the seven-year exemption	$34.7 million
State plugging cost avoided, 7,124 wells at $10,227	$72.9 million
Total public revenue effect	**$337.7 million**
Private capital required	$605.5 million

Sources: incremental volume and well count from the base scenario in Section 8.1; tax rates from Kansas Department of Revenue[92]; plugging cost per well from Kansas Corporation Commission, plugging update[93].

The policy read is straightforward. The seven-year severance exemption is not a giveaway; it is the instrument by which Kansas converts a shrinking, liability-bearing wellbore population into a producing, tax-paying one. Its cost to the state is deferred severance on barrels that would not otherwise have been produced at all. Its return is an ad valorem base preserved immediately, a plugging bill deferred or avoided, and taxable production standing in year eight — purchased with $606 million of entirely private capital.

[90] Kansas Corporation Commission, *Abandoned Well Plugging Update*.
[91] Kansas Corporation Commission, *2025 Abandoned Well Status report*.
[92] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[93] Kansas Corporation Commission, *Abandoned Well Plugging Update*.

9 RISKS, COUNTERARGUMENTS, AND LIMITATIONS

Zones may be wet or non-productive. This is the primary technical risk and it is irreducible. A vintage log showing porosity does not establish movable hydrocarbons. The mitigations are to prioritize wells with documented drill-stem tests or mud-log shows in the uphole interval, to require offset production from the target zone within a defined radius, and to accept a 35% to 45% failure rate in the program budget rather than in the pro forma.

Mechanical condition may not support the work. Casing corrosion, poor primary cement, and collapsed intervals can convert an $85,000 recompletion into a $200,000 salvage operation or a plugging job. Casing integrity evaluation belongs in pre-acquisition diligence, not post-acquisition engineering.

Thin pay limits per-well upside. Kansas pay zones are genuinely thin — Donelson West net pay was 6 to 10 feet, and the Lansing–Kansas City C interval perforated in the DOE project was 12 feet. Thin pay caps per-well rate and makes the difference between four and eight barrels per day a matter of a few feet of net pay, which is why log-based net-pay determination is the highest-leverage analytical step in the program.

Water handling can dominate economics. Kansas carbonates, particularly the Arbuckle, produce large volumes of water. The Hillsboro proposal targeted raising water production from 400 to about 4,000 barrels per day in order to raise oil from 10 to 40 barrels per day[94] — a ten-fold increase in water handling for a four-fold increase in oil. At the $0.05 per barrel disposal fee used in Kansas case-study economics,[95] that is manageable; at third-party trucking rates it may not be. Disposal capacity and cost must be secured before, not after, a recompletion program begins.

Oil price sensitivity. The economics presented rest on an $88 wellhead price derived from a WTI spot price near $97 in September 2026.[96] Sources for near-term prices in this period diverge, with market-reference quotes near $101 to $103 per barrel,[97] so the price environment should be treated as favorable but volatile. The sensitivity analysis in Section 5.5 shows the base case remains positive at a $45 wellhead price above five barrels per day of incremental rate, which is the relevant stress test. It is worth noting that the Kansas gel-polymer program paid out in months at $22 per barrel.

The severance exemption requires administrative discipline. The seven-year exemption depends on a defensible base-production calculation filed by affidavit with

94 Kansas Geological Survey, [Hillsboro field proposal].
95 Kansas Geological Survey, PTTC gel polymer case studies.
96 U.S. Energy Information Administration, Cushing WTI spot price series.
97 Trading Economics, “Crude Oil”, market data series.

supporting documentation, and it excludes zones subject to a proration order.[98] An operator who fails to document base production forfeits a benefit worth roughly 4.33% of gross revenue for seven years.

Ad valorem consequences are real. Because recompletion is excluded from allowable operating expense in county appraisal formulas while raising appraised production, successful work raises property tax without a corresponding expense offset in the appraisal.[99] This should be modeled, not ignored.

Data limitations of this study. Three gaps should be acknowledged. First, no public dataset tracks the annual number of recompletions filed in Kansas, so the claim that recompletions are under-performed relative to opportunity is inferred from the low reinvestment rate, the single-pay-field share, and recovery efficiency rather than measured directly from intervention counts. Second, the recompletion cost stack in Section 5.1 is assembled from Kansas-specific rig, wireline, and workover benchmarks rather than from a published Kansas recompletion AFE, because operators do not publish them; actual costs will vary materially by depth and county. Third, the statewide prize scenarios in Section 8 are constructed estimates, not a resource assessment, and are presented as scale indicators rather than reserves.

10 CONCLUSION

The evidence supports each element of the thesis.

Kansas geology is stacked. Eighteen stratigraphic zones produce oil, five of them in nearly 200 or more fields each, and up to twelve can be productive at a single locality.[100]

That geology is under-completed rather than under-drilled. All major Kansas fields have multiple pay zones, yet about half of producing fields are developed as single-pay fields, and those single-pay fields yield only about one-fifth of cumulative production. The state's own survey describes trends with relatively few pay zones as "underdeveloped," and identifies openhole and partial completions, excessive well spacing, bypassed attic oil, and thin pays as the operational causes of remaining oil in place.[101]

[98] Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[99] Barber County, Kansas, *2024 Oil and Gas Appraisal Guide*.
[100] Kansas Geological Survey, *Oil and Gas Investigations 16*; Kansas Geological Survey, *Subsurface Geology Series 9*, page 3.
[101] Kansas Geological Survey, *Open-File Report 99-22*.

The oil is measurably still there. The dominant Lansing–Kansas City oomoldic reservoirs recover less than 25% of oil in place and frequently fail to respond to waterflooding.[102] Donelson West had produced 17% of its oil in place after 44 years.[103] The Department of Energy classified more than 48 billion barrels in this reservoir type as at risk of abandonment.[104]

The wellbores that reach it already exist and are being harvested, not developed. 47,494 producing oil wells average 1.46 barrels per day, 61% of them produce under one barrel per day, and the state adds roughly 650 new oil wells per year against that base — a 1.4% annual reinvestment rate.[105]

And the economics of using those wellbores beat the economics of drilling new ones by a wide margin. A recompletion adds reserves at roughly $4 to $7 of capital per barrel against $13 to $16 for a new well, avoids $50,000 to $70,000 per year of incremental operating cost by sharing an existing facility, breaks even at approximately four incremental barrels per day in a state where 92% of wells produce less than that, and enjoys a seven-year severance tax holiday on its incremental volumes that no new well can claim.[106]

The market prices Kansas wellbores on the cash flow of the zone that happens to be perforated today, typically at 15 to 20 times monthly cash flow, and assigns essentially no value to the remaining penetrated section.[107] That is the arbitrage. It does not require new technology, new acreage, or new drilling permits. It requires log analysis, a cement plug, a perforating gun, and the discipline to document base production before the rig arrives.

Kansas does not need more wells. It needs more of its existing wells to produce from more than one zone.

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[102] Kansas Geological Survey, *PRS Poster 2002-48*.
[103] Oil & Gas Journal, “RJD Revitalizes Mature Kansas Oilfield”.
[104] U.S. Department of Energy, Office of Fossil Energy, [Techline: reservoir class program].
[105] University of Kansas, Institute for Policy and Social Research, *Kansas Statistical Abstract*; U.S. Energy Information Administration, *Distribution of Wells by Production Rate*; Kansas Geological Survey, Well Statistics.
[106] Kansas Independent Oil and Gas Association, [Securities brochure]; Barber County, Kansas, *2024 Oil and Gas Appraisal Guide*; Kansas Department of Revenue, *Minerals Severance Tax (MT-6)*.
[107] Ironwood Royalty, “Central Kansas Uplift” (industry pricing reference).

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