

THQ Appalachia unlocks the deep Utica in West Virginia

The management team behind **Tug Hill**, which helped pioneer the Marcellus shale more than a decade ago, now says it has cracked the code to economic development of the dry gas Utica in West Virginia. The Fort Worth company's upstream business, **THQ**



Appalachia I LLC, has been quietly building a highly contiguous acreage position in the state's Panhandle region and deploying innovative technologies for co-development of the Marcellus and Utica. These advancements have made THQA the first operator east of the Ohio River to move beyond appraisal into full pad development of the Utica, with "the lowest-breakeven dry gas in the entire Appalachian Basin," COO Evan Radler told **Drillinginfo**.

Multiple companies, including **Gulfport Energy**, **Ascent Resources** and **Rice Energy** (before its acquisition by **EQT Corp.**), have established producing operations on the Ohio side of the Utica. But the shale deepens as it moves eastward into West Virginia and southwest Pennsylvania, driving typical well costs much higher. Some West Virginia operators have been able to achieve well costs of \$15-18 million, but most have reported costs exceeding \$20 million, Tug Hill said. **Continues On Pg 4**

Co-development with Marcellus on pads yields basin's 'lowest-breakeven dry gas.'

Roan raises Q2 production guidance on strong wells

Roan Resources provided updates for the Mad Play, Earl and Victory Slide units in Oklahoma's Merge play, with continued strong well rates. Mad Play, which reached first sales in April, is comprised of two Woodford and two Mayes producers in Canadian County, Oklahoma, drilled on 500-ft horizontal spacing with laterals averaging 6,780 ft. Initial 15-day rates averaged 1,818 boe/d (45% oil, 21% NGLs), normalized to 10,000 ft, and 30-day rates ran 1,602 boe/d (44% oil, 20% NGLs).



Also in Canadian County, Earl came online in April. The three Woodford and three Mayes wells averaged 10,165-ft laterals and were spaced at 500-800 ft, which Roan said was not optimal for the Woodford wells on the unit. Normalized to 10,000 ft, 15-day rates averaged 932 boe/d (45% oil, 23% NGLs) across all six wells. The Mayes wells averaged IP15s of 1,688 boe/d (42% oil, 25% NGLs) and IP30s of 1,466 boe/d (39% oil, 24% NGLs). **Continues On Pg 16**

Wells in the program declined only ~6% from 90 days to 150 days.

Lilis encouraged by first spacing test, Bone Spring potential

Permian-focused **Lilis Energy** front-loaded much of its 2019 capex to take advantage of uplifts in realized pricing and other margin enhancements. Of its \$60-70 million 2019 capex, ~\$53 million is earmarked for H1. The company started the year with six DUCs and is converting those wells to sales primarily in H1. Results are available for three of those wells, all targeting the Wolfcamp A in Winkler County, Texas. The Haley #1H flowed an initial 24-hour rate of 1,422 boe/d (79% oil), or 317 boe/d per 1,000 lateral ft. The Haley #2H delivered an IP24 of 1,048 boe/d (61% oil), or 234 boe/d per 1,000 ft. The two wells were Lilis' first spacing test, with 1-mile laterals 600 ft apart horizontally and 150 ft vertically.



660-ft spacing test in the Wolfcamp beating type curve expectations.

"We're extremely pleased with the results of these two wells, which both exceeded IP rates per 1-mile wells, and Haley #1H exceeded our 1.5-mile target IP 24-hour rate," outgoing CEO Ronald Ormand said during a May 10 conference call. The third well, the Oso #1H, flowed a 910 boe/d (55% oil) IP24 from a 1.5-mile lateral during clean-up.

"We also continue to monitor results from spacing tests offsetting us to the south and west in Texas," SVP and chief technology officer Sarath Devarajan said during the call. "We've seen several examples of 660-ft spacing tests in the Wolfcamp A and the Wolfcamp B south of us that are very encouraging." **Continues On Pg 8**

Oil Search plans additional Pikka drilling, increases stake

Oil Search confirmed its commitment to the Pikka Nanushuk unit on the North Slope by increasing its share in the unit and planning to sell down other Alaskan assets. The company recently completed a comprehensive two-rig, four-well drilling program. A material resource upgrade is likely following the completion of reservoir modeling and integration of the data acquired from the campaign. **Continues On Pg 17**



Foresees commencing FEED later this year, first production in 2020.

This reservoir model will be further enhanced with the results of processing a "mega-3D" seismic dataset. The company expects to announce a contingent resource increase ahead of the front-end engineering design decision. Planning is now underway for an exploration well and an appraisal well to be drilled by 2020 with two separate rigs.

Continues On Pg 17

DEALS FOR SALE

VERMILION PH., LA WI FOR SALE

5-Wells. 2-Producing. 1-PDNP. 2-SWD.

PROLIFIC SOUTH LOUISIANA

BAYOU HEBERT & TIGRE LAGOON

PP

Lower Cris R Production.

BEHIND PIPE POTENTIAL

~242-Net Acres. All Held By Production.

~8.3% NonOperated WI & 6.0% NRI

HBP

Net Production: 74 BOPD & 2,209 MCFD

Gross Prod: 1,361 BOPD & 40,366 MCFD

Recent Net Cash Flow: ~\$467,450/Mn

OFFERS WANTED BY JULY 18, 2019

PP 2072DV

EAGLE FORD (OIL WINDOW) NON OP

313-Total Wells. 4,656-Net Acres. (84% HBP)

DIMIT. FRIO & LA SALLE

PP

Operated by CHK, Carrizo & Crimson

228-PUDS & 77-PROB Locations.

Additional Inventory of Re-Frac Candidates.

Up to 10% NonOp WI: 75-79% Lease NRI

>700
BOED

Net Production: 707 BOED (70% Oil)

Gross Prod: 13,014 BOPD & 31.9 MMCFD

Net Cash Flow: ~\$833,000/Month

Extended Lateral Drilling Program On AMI

PDP Net Reserves: 1,731 MBO & 3.6 BCF

OFFERS DUE BY JULY 18, 2019

PP 2071DV

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PLS

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88 Energy	Plans for winter drilling season	Alaska	17
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Encana	Permian liquids up 3x at 20% less cost since Athlon buy	Permian	6
Encana	Completes Green River well	Rockies	15
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EOG Resources	Flows nearly 1,000 boe/d per 1,000 ft	Permian	7
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XTO Energy	Texas Haynesville well delivers	Ark-La-Tex	15

Eastern

Appalachia extends streak of monthly gas output records

The Appalachian Basin is projected to reach another gas production record in July after posting new highs every month this year. The Energy Information Administration predicts a 347 MMcf/d rise sequentially and ~4.5 Bcf/d increase YOY to 32.4 Bcf/d. Volumes have already climbed ~1.3 Bcf/d in 1H19.

Rig activity in the basin has been stable in the last year, according to **Drillinginfo's Rig Analytics**. As of June 17, there are 66 rigs running in Appalachia: 16 in Ohio, 30 in Pennsylvania and 20 in West Virginia. A year ago, the basin had 67 rigs active: 20 in Ohio, 30 in Pennsylvania, 16 in West Virginia and one in Virginia.

Drilled but uncompleted wells have declined every month in Appalachia since March 2018, according to the EIA. Since that time, the DUC count has fallen by 285, or 39%, to 437 as of May. The EIA began recording DUC data in December 2013. The data shows that Appalachian DUCs peaked in February at 1,256.

ABOUT THIS REPORT

PetroScout (USPS 13410) is published every three weeks and covers the US E&P sector, including discoveries, drilling and completion activity, well results, development plans, regulatory updates and licensing.

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E&P operators tally strong IP rates in multiple basins

US upstream operators continue to turn in impressive horizontal well rates across many onshore plays. As they refine completion techniques, well productivity goes up. Also, several companies are getting encouraging results from spacing tests.

IN THIS ISSUE

In the Bakken, **WPX Energy's** 2019 wells are tracking far above the 1.0 MMboe type curve, and seven of its top 10 initial rates were from wells completed this year (PG.6). Most recently, on the Minot Grady #26 pad at Squaw Creek field, two Middle Bakken and four Three Forks producers averaged 4,018 boe/d (88% oil), or 410 boe/d per 1,000 lateral ft. As **XTO Energy** clears a backlog of drilled but uncompleted wells, one well spudded in 2016 came online at a company-record 24-hour rate for the Williston Basin (PG.5).

In the Eagle Ford, **Lonestar Resources'** 2019 wells in the Horned Frog area are outperforming 2018 producers per lateral foot and pushing company production to records each month (PG.5). Most recently, the Horned Frog F #A1H was completed with a 42-stage frac job across a 12,461-ft effective lateral and flowed at a three-stream rate of 2,387 boe/d (23% oil, 27% NGLs).

In the Permian, **Centennial Resource Development** announced strong wells results from multiple intervals (PG.7). In Reeves County, Texas, the Doc Martens Unit U03H, U09H and U16H wells were drilled on 660-ft spacing in the Upper Wolfcamp, compared with the standard 880 ft. The horizontals averaged 7,600-ft effective laterals and initial 30-day rates of 1,775 boe/d (81% oil), or 234 boe/d per 1,000 lateral ft. The rates surpassed expectations and significantly exceed legacy results.

Lilis Energy's Haley #1H flowed an initial 24-hour rate of 1,422 boe/d (79% oil) from a 1-mile lateral, or 317 boe/d per 1,000 lateral ft. The Haley #2H delivered an IP24 of 1,048 boe/d (61% oil), or 234 boe/d per 1,000 ft, from a 1-mile lateral. The two wells were Lilis' first spacing test, with the laterals 600 ft apart horizontally and 150 ft vertically (PG.1).

Eastern

EQT reports operational improvements ahead of Q2's end

EQT Corp. continued to tally operational efficiencies in Q2 as it pursued its "Target 10%" initiative. Target 10% aims to reduce cash costs 10%, and the company expects \$25 million of additional annual capex savings as a result of the program. Management has identified \$175 million in annual savings to date and now expects adjusted free cash flow of over \$3.0 billion through 2023, rising to \$3.4 billion if Target 10% is fully realized.

EQT's most recent operational achievements include an 8% decrease in drilling days per 1,000 ft in Q2 versus Q1. Frac stages per crew improved by 20%, and frac plugs drilled out per day increased by 14% during the quarter.

"We have incredible momentum and are firing on all cylinders at EQT," president and CEO Rob McNally said. "We are on track to deliver strong financial and operational performance, including second-quarter production volumes at the high end of guidance and continued improvements in operating efficiencies. Importantly, the significant operational improvements we drove through the end of May will enable us to achieve the same level of activity with fewer resources."

Over 3 million ft drilled 100% remotely via EQT's real-time operations center.

Capital Markets
drillinginfo
SWN buying back \$90MM in debt, \$200MM in equity
Equity buyback would be funded with \$1.85 billion sale of Fayetteville assets
Gaster delisting fundamental change for Arco

Capital Markets June 21

EQT & Rice Bros. make their cases for July 10 meeting.

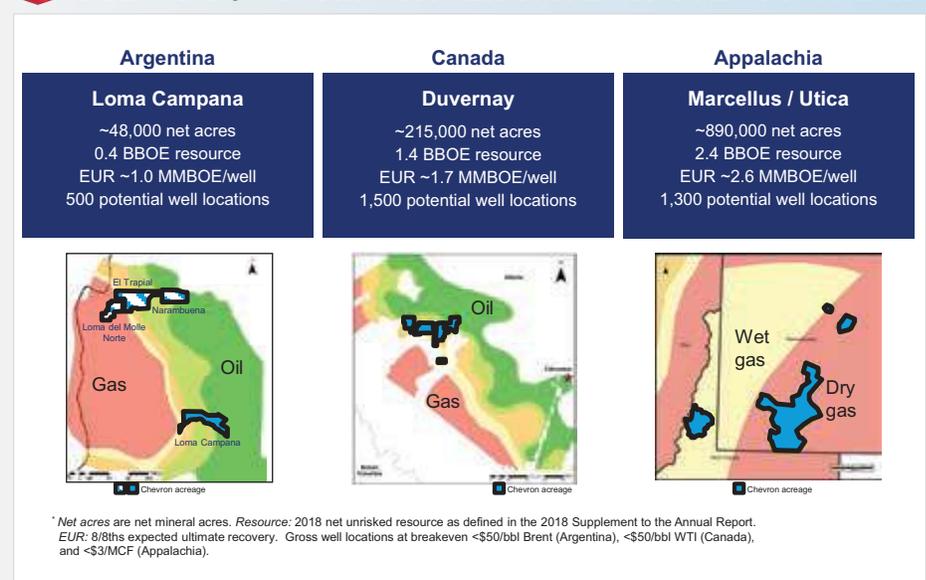
Chevron improves EURs, lowers costs in Appalachia

Chevron plans to drill 30-40 wells in Appalachia in 2019 after re-starting development drilling in 2018 following the buildout of infrastructure that improved differentials. Wells are being drilled with a new design that includes longer laterals, improved frac efficiency and higher-density completions. Current wells average 8,600-10,000-ft laterals and ~2.6 MMboe EURs. Development costs are coming in at \$4.20-\$5.70/boe. Last year, lateral lengths were 50% longer than in 2016, development costs were down 30% and EURs were up 60%.

Chevron holds 890,000 net acres in the play with ~1,300 potential well locations at a breakeven of \$3.00/Mcf Henry Hub and an estimated 14.4 Tcfe net unrisks resources as of YE18. The company sees exploration upside in the deep Utica.

Back in SW Marcellus development mode with deep Utica upside.

Marcellus/Utica in CVX's 2nd Shale Tier After Permian



Source: Chevron June 6 Presentation via PLS docFinder www.plsx.com/finder

Eastern

THQ Appalachia unlocks the deep Utica ◀ Continued From Pg 1

Thus, spectacular wells like **Range Resources'** 59 MMcf/d Claysville Sportsman's Club-1 in 2014 and EQT's 73 MMcf/d Scotts Run 591340 in 2015 have remained isolated occurrences rather than a launch of full-scale development programs.

In contrast, THQA's use of high-spec walking rigs to drill large multi-well pads and proprietary drilling practices have helped the company achieve well costs of \$10.5 million or better, engineering and development SVP Sean Willis told Drillinginfo. The company's 2019 Utica wells have come in under \$10 million, or \$1,050 per completed lateral foot with laterals averaging 9,100 ft. The most recent wells have been drilled in less than 30 days, which Willis said is at least 33% faster than THQA's fastest competitors in the deep Utica. The company has turned eight deep Utica wells to sales, drilled 12 to TD and spudded six more. It is running four rigs and two to three frac crews to turn 60 total rich Marcellus and dry Utica wells to sales this year, with plans to add a fifth rig in late 2019 or early 2020.

The wells have proven extremely prolific. THQA has observed casing pressures up to 9,500 ft in its deep Utica wells, which it is producing under pressure and rate management with plateau rates of 15-20 MMcf/d projected to hold flat for ~485 days.

"We recently conducted a productivity test in one of our Utica/Point Pleasant wells," Willis said. "And that well demonstrated production potential of greater than 100 MMcf/d ... but we choose to continue to produce through a rate and pressure management practice that maximizes the ultimate value of the wells."

In the rich Marcellus, the company says it has consistently achieved peak condensate rates of 500-800 bbl/d and ~60% overall liquids weighting. THQA is spending less than \$950 per completed lateral foot to bring these Marcellus wells online. Its recent Marcellus wells have been drilled in about 10 days, spud to rig move, with laterals exceeding 7,500 ft.

Tug Hill attributes its best-in-class well costs largely to the co-development of the deep Utica with the Marcellus over the last two years on large pads averaging eight to 10 wells. Drilling, completion and production operations occur simultaneously on the same pad, with drilling operations sequenced to maximize savings.

▶ Continues On Pg 5

Deep Utica wells running \$9.6MM, or \$1,050 per completed lateral foot.



Midstream Intelligence A drillinginfo

Domestic Energy proposes to acquire its MLP
 Dominion Energy is ready to buy up to 40% interest in partnership, offering 1.5 billion
 Kinder Morgan marketing remaining Canadian assets

Midstream Intelligence July 3

Tug Hill's XcL links S. Appalachian gas to multiple markets.

EAST TEXAS

HARRISON CO., TX PROSPECT

Horizontal Development Wells.

WOODLAWN FIELD

Cotton Valley Horizontal
10% NonOperated WI For Sale

Producing Wells On All Sides.

EUR: 74 MBO & 6.2 BCF/Well

DV 9162

DV

COTTON VALLEY

MARION CO., TX PROSPECT

7,800-Net Mineral Acres.

HORIZONTAL PETTET FORMATION

VOLATILE OIL WINDOW

Target Depths Of 5,000' - 6,000'

Potential EURs: ~430 MBO & 0.5 BCF

DV 1394

DV

PETTET

FLORIDA

FLORIDA ACREAGE OPPORTUNITY

S. FLORIDA CARBONATE BASIN

Lower Cretaceous Age

Sunniland Limestone Formation.

OPERATIONS AVAILABLE

DV 1341

DV

SUNNILAND

MISSISSIPPI

PIKE CO., MS PROSPECT

+/- 244.77-Net Leased Acres.

FRIENDSHIP CHURCH FIELD

L. Tuscaloosa Denkman Sand.

TVD: 11,000 Ft.

Well Control & 2D Seismic Data.

10% NonOperated WI: 7.5% NRI

Estimated Reserves: 768,468 BO

Completion Cost: \$775,000

G&G Cost: \$198,522 Drilling: \$870,000

DV 9582L

DV

TUSCALOOSA

TEXAS GULF COAST

GULF COAST BASIN PROSPECT

12,400-Net Acres.

FAYETTE & LAVACA CO., TX

AUSTIN CHALK TREND

Defined By Subsurface Geology.

100% OPERATED WI: 75% NRI

Est. Net Reserves: 400-500 MMBOE/Well

3 Year+ Extensions Lease Term.

DV 1709

DV

AUSTIN CHALK

TEXAS GULF COAST - ONSHORE

20,500-Acres, 50+ Locations.

200 MILLION BARREL OIL PLAY

Conventional Drilling

Great Daily Rates with High EUR's **CONVENTIONAL**

Operations Available

Prospect, Land, 3D, Processing And--

--Drill, Test & Comp First Well: \$8.75MM

DV 2146

DV

CONVENTIONAL

More slides at plsx.com/docFinder

THQA Acreage Position & Operational Highlights

- Highly contiguous acreage in W.V. Panhandle
- 4 rigs fully developing liquids-rich Marcellus & dry Utica off same pad (avg. 8-10 wells)
- Turning-in-line 60 wells in 2019
- Industry-leading Utica well costs of \$1,050/lateral ft
- Avg. Marcellus well costs < \$950/lateral ft
- Drill-ready inventory of 18+ months for every active rig
- XcL Midstream provides THQA with highest netbacks in region, connectivity to nearly every major price point in basin
- Dry-gas Utica enables XcL to blend 99% of ethane from its rich Marcellus feed gas back into residue stream, providing key advantage

Source: THQ Appalachia I LLC

Eastern

THQ Appalachia unlocks the deep Utica

◀ Continued From Pg 4

To facilitate these complex, simultaneous operations, Tug Hill employs innovative construction techniques to place the wellhead and production facilities below ground in subgrade cellars, allowing the rig to move freely on the pad. The biggest pad that Tug Hill has completed to date has 19 wells, and a 27-well pad is in progress.

Another contributor to the low well costs is the use of water supply from Tug Hill's midstream company **XcL Midstream** for fracking operations. The water business utilizes a network of large above-ground storage tanks and can support up to four

300 MMcfe/d output to hit 500 MMcfe/d by YE19 as larger pads come online.

simultaneous frac jobs. XcL also recently commissioned its Appalachia Connector system for rich and dry gas gathering and transport, and is building an 800 MMcf/d gas processing complex in Marshall County.

THQA's prolific Utica dry gas output enables XcL to blend 99% of the ethane from its rich Marcellus feed gas back into the residue gas stream from its processing facility, Radler said. This provides a key economic advantage compared to other gas processors in the area, which he said must typically recover 40-50% of their ethane to meet regulated pipeline specs. The multiple interstate pipelines accessed by the Appalachia Connector's dry gas transport line further improves the margins for THQA's production, which the company believes are running ~17% higher this year than its nearest competitor and ~43% higher than the median value in southwest Appalachia on an EBITDA/Mcfe basis. Tug Hill expects these margins to improve further as more of the XcL facilities come online in the next 12 months and provide additional gas marketing optionality.

THQA has current net production of 300 MMcfe/d (~35% liquids) and expects to exit 2019 at 500 MMcfe/d as additional wells on its larger pads turn to sales. By YE20, the company anticipates net volumes of 700 MMcfe/d. It has an estimated 18 months of drill-ready inventory for each of its four operated rigs.

South Texas

Matador concludes Eagle Ford program, pleased by results

Matador Resources concluded its 4Q18-2Q19 nine-well Eagle Ford program in late May, turned all the wells to sales and released the rig. Seven of the wells have longer laterals that measure 7,800-10,000 ft. Following this drilling program, Matador's 28,900-net-acre Eagle Ford footprint is 94% HBP.



In Atascosa County, Texas, the Haveriah B #1H and A #2H flowed 24-hour IPs of 1,140 boe/d (94% oil) and 1,310 boe/d (95% oil), respectively. To the west in La Salle County, five wells were completed on the Lloyd Hurts lease. Four had IP24s ranging 820-1,201 boe/d (78-85% oil); a fifth is flowing back.

"I think we were pleased with the results from these wells. Especially, some of these Eagle Ford wells that we drilled in the northwest part of La Salle County were among the best wells that we have drilled in that area," CFO David Lancaster said during a June 6 conference call. "Also, I think that we're all, on the executive team, pretty pleased to see how well the operations team did with the costs on these wells. And a number of them came in well below what our expectations were."

Some of the nine 4Q18-2Q19 wells came in under budget.

Lonestar sees YOY improvement in Horned Frog completions

Lonestar Resources' 2019 wells in the Horned Frog area of La Salle County, Texas, are outperforming 2018 producers per lateral foot and pushing its production to company records each month. Most recently, the Horned Frog F #A1H flowed a three-stream IP rate of 2,387 boe/d (23% oil, 27% NGLs) along its 12,461-ft effective lateral, which was fracked in 42 stages with 2,312 lb of proppant per foot. Another Horned Frog well, the #B1H, flowed 2,607 boe/d (24% oil, 27% NGLs) from a 12,170-ft effective lateral that was fracked in 41 stages using 2,338 lb of proppant per foot. The oil rates per foot from these two wells are 26% higher than 2018's Horned Frog #G1H and #H1H and 7% higher than all 2018 completions. The 2019 wells are testing higher proppant loads.



Lonestar also disclosed peak 30-day rates for two wells with ~9,700-ft effective laterals brought online earlier this year at Horned Frog Northwest. The Horned Frog NW #4H's flowed 1,426 boe/d (54% oil, 23% NGLs), and the Horned Frog NW #5H delivered 1,481 boe/d (52% oil, 24% NGLs). These wells were fracked using diverters and averaged proppant concentrations of 2,030 lb/foot over 33 stages. These peak IP30s are 3% higher per foot than their immediate offsets, the #2H and #3H wells placed onstream in 2018. Moreover, the 2019 wells have produced more oil and NGLs per foot than the 2018 completions.

With \$8.1MM D&C costs, IRRs at Horned Frog are 67% at \$55 oil and \$2.75 gas.

Bakken

XTO Energy seeing some of its best Williston Basin IP24s

As **XTO Energy** clears a backlog of drilled but uncompleted wells, one well spudded in 2016 recently came online at a company-record 24-hour rate for the Williston Basin. Located at Lost Bridge field in Dunn County, North Dakota, the Nygaard Federal #13X-5EXH was fracked in 40 stages and with 8.1 MMLb of proppant along a 10,198-ft effective lateral and flowed 2,712 boe/d (80% oil), or 266 boe/d per 1,000 lateral ft, from the Three Forks on a 26/64-inch choke at 2,746 psi FCP.



On the same pad, the Nygaard Federal #13X-5BXC delivered a 1,931 boe/d (82% oil) IP24, or 189 boe/d per 1,000 ft, from a 10,194-ft effective lateral in the Three Forks First Bench. This represents a top-10 IP24 for XTO in the basin.

Earlier this year, XTO flowed some of its best IP24s from 2-mile laterals on the Roxy pad at West Capa field in Williams County. The Roxy 21X-6AXD was fracked in 40 stages with 8.1 MMLb of proppant and produced 2,238 boe/d (71% oil), or 215 boe/d per 1,000 ft, from the Bakken. The Roxy 21X-6EXH delivered 1,999 boe/d (71% oil), or 193 boe/d per 1,000 ft, from the Three Forks after being fracked in 40 stages with 5.1 MMLb of proppant.

Three Forks producer in Dunn County, ND, delivered 2,712 boe/d (80% oil).



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The image shows a blurred table with three columns and multiple rows of data. The table is mostly illegible due to the blur, but it appears to have a header row and several data rows. The columns likely represent different categories or metrics, and the rows represent individual data points or transactions.

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