

TUSCALOOSA MARINE SHALE PROSPECT

Washington Parish, Louisiana

August, 2020



Tuscaloosa Marine Shale Prospect Summary



- **The Tuscaloosa Marine Shale (TMS) in Washington Parish, LA contains all the elements of a highly prospective unconventional oil shale play**
 - **Thick, organic-rich source/reservoir section (100'+, >2% original TOC)**
 - **Mature for the generation of light, sweet oil (approx. 0.6% Ro)**
 - **Located at reasonable drill depths (9,000' to 11,000' in WY Acreage)**
 - **Favorable political environment for oil development**
 - **Good infrastructure and product markets (gas prices close to Henry Hub and oil sold at a premium to WTI)**
 - **Favorable drilling and completion costs after initial learnings**
 - **Wells produce oil at high rates with reasonable initial decline rates**

TMS Prospect Summary (Continued)



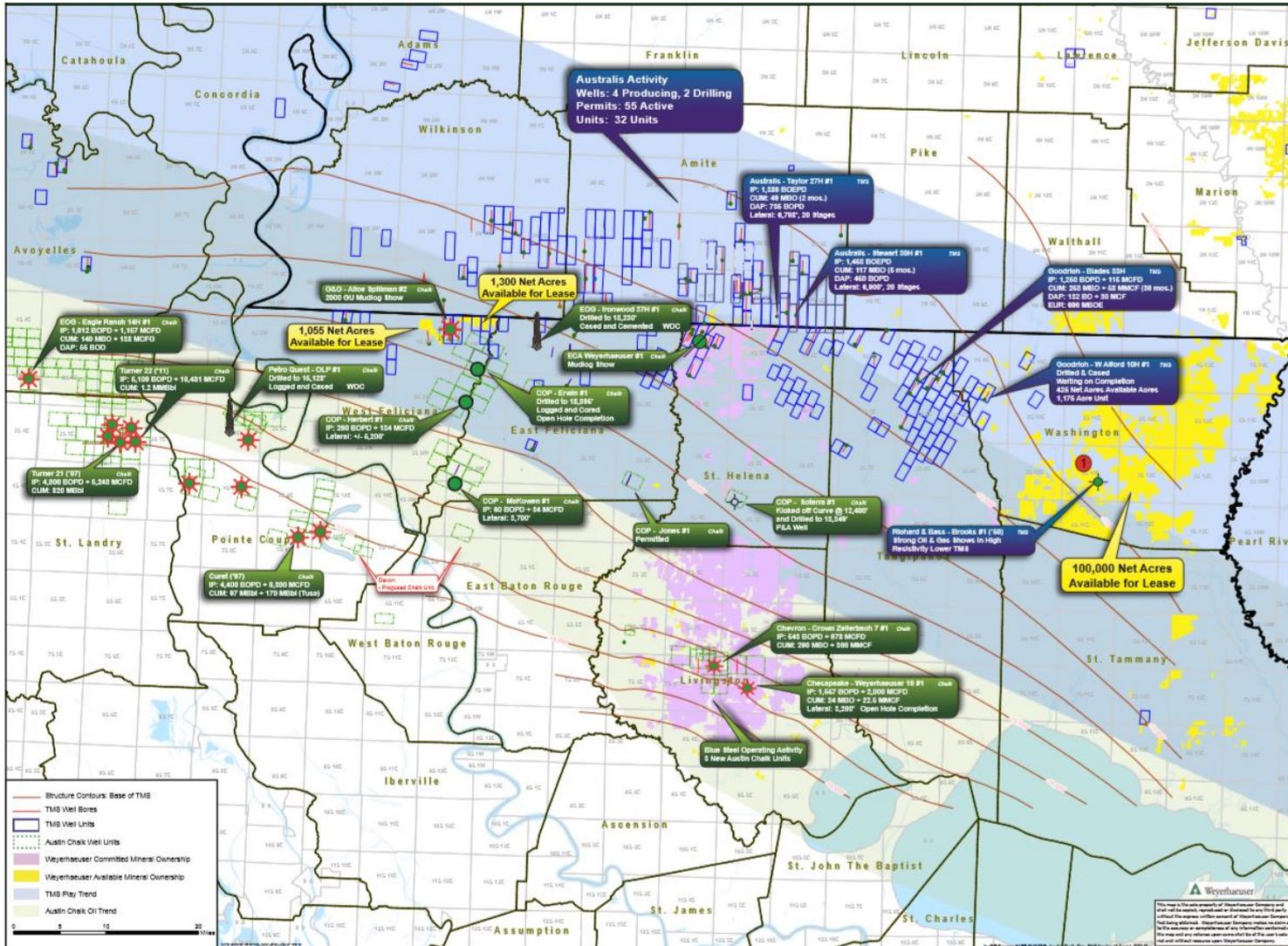
- **Washington Parish acreage has been de-risked by productive wells drilled to the west and northwest**
- **Well log character in Washington Parish type well is analogous to highly productive, lower water cut offset production**
- **Geologic characteristics in the western TMS play (higher water cut) differ significantly from the higher prospectivity eastern TMS**
 - **Significantly thicker pre-TMS fracture barrier between the basal TMS and Tuscaloosa Massive water bearing sandstone**
 - **Gravity and magnetics available to locate wells on undisturbed basement blocks and away from potential shears that could have potential as fluid conduits**
- **Suggested Option terms:**
 - **Minimum 20,000 acres**
 - **\$20 per acre Option**
 - **2-year Option term**
 - **Pre-Paid Lease Commitment: 10% of option area**
 - **Lease terms negotiable**

Tuscaloosa Marine Shale Play Locator Map



- **Recent Tuscaloosa Marine Shale drilling and production activity highlighted in blue**
 - **The TMS Play is represented by the lighter blue band trending NW to SE across the top of the map on the next slide**
 - **Key wells are the Stewart 30H #1 – 1,468 BOEPD IP and 117 MBO six month cum; Blades 33H 1,260 BOPD and 115 MCFD IP; W Alford 10H #1 drilled and cased on WY minerals but never completed; and Brooks #1 TMS Type Log with extremely strong oil and gas shows**
 - **Blue rectangles are TMS units filed with the states of Louisiana (NE-SW angle) and Mississippi (vertical orientation)**
 - **Weyerhaeuser available acreage is colored yellow and about 100,000 WY acres are available in Washington Parish, LA**
 - **WY committed acreage is depicted in purple; some of these tracts may become available as they were leased for the Austin Chalk Play. Austin Chalk activity is highlighted in green**

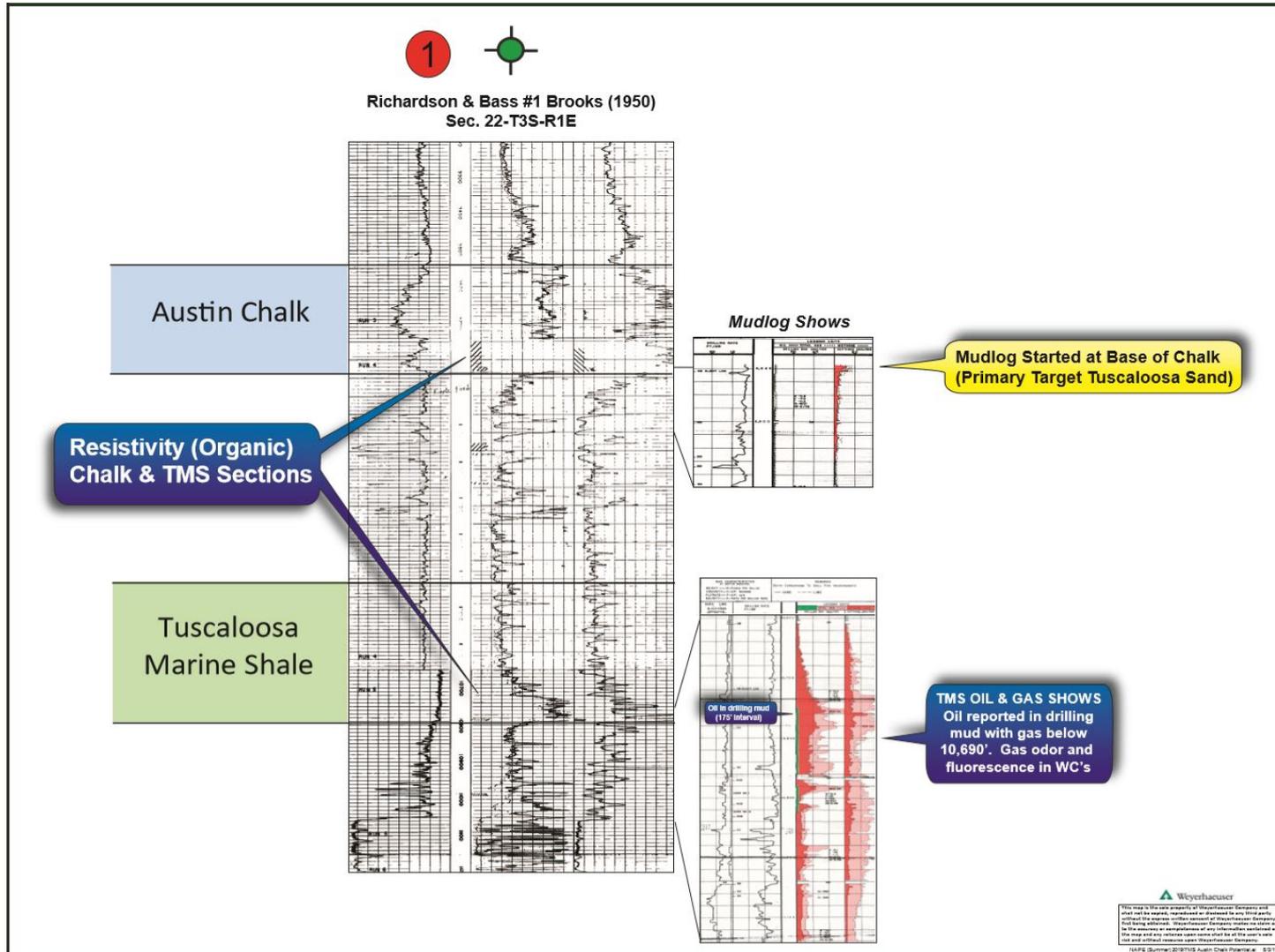
Tuscaloosa Marine Shale Play Locator Map





- **The Brooks #1 straight hole is a deep older vintage well that penetrated the TMS and proves the highly resistive and organic nature of the TMS, and defines the thickness of the pre-TMS fracture barrier (approx. 300' thick)**
- **A section of the mudlog is included on the next slide with annotation describing the excellent oil and gas shows in the mud and sidewall cores**

TMS Washington Parish, LA Type Log



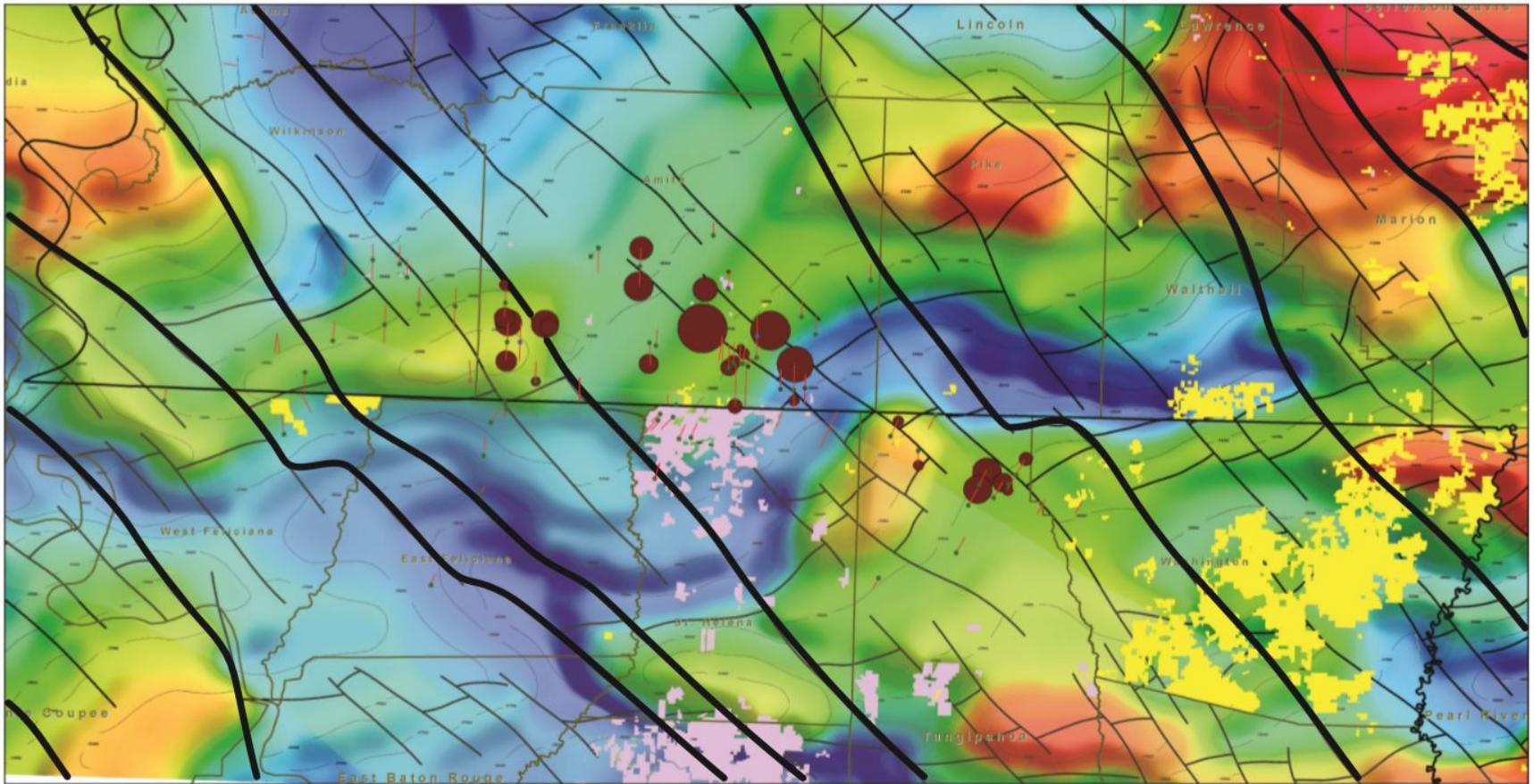


- **The next map illustrates the regional depth structure on the top TMS and shows the relatively gentle dip to the SW. The color bar and contours show Washington Parish drill depths of about 9,000' to 11,000'**
- **The bubbles illustrate cumulative oil production in green and cumulative water production in blue. Higher water cut wells have a greater percentage of the bubble in blue. From these bubbles it can be noted that higher water cut wells are generally located to the west and water cuts become lower towards the eastern TMS play.**
- **The red line depicts a regional cross-section that will be discussed later in this presentation**



- **The color shaded contours represent depth to basement interpretation based on gravity and magnetics by Earthfield Technologies (see scale bar at lower right)**
- **Black lines are interpreted shears (thicker lines) and basement involved faults. The shears were thought to be the source of produced water but we believe that thickness of the basal fracture barrier is the primary controlling factor.**
- **EUR bubbles in burgundy illustrate larger EUR with larger radius bubbles and illustrate higher oil EUR to the east near Washington Parish**
- **These bubbles also show high production in areas with interpreted basement faults**

TMS Play Basement Structure (Gravity and Magnetics) and Oil EUR Bubbles

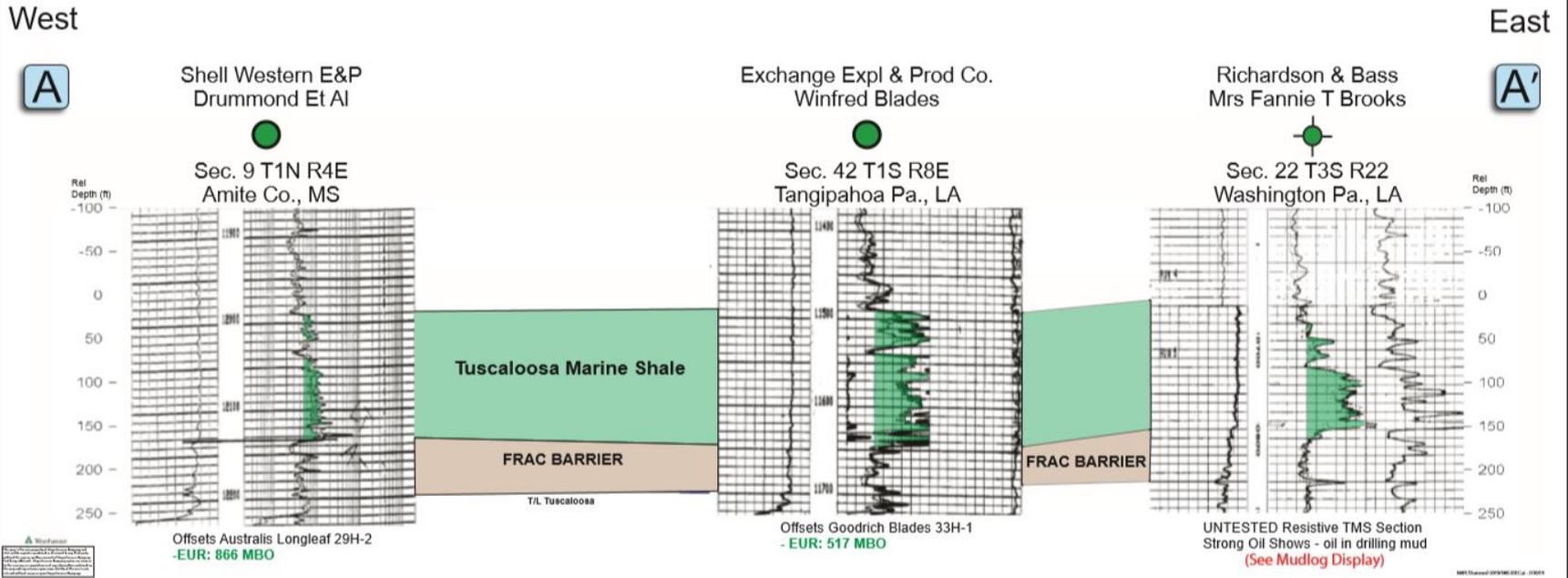




- **The next slide is a cross section from vertical wells in Amite County, MS and adjacent to a high cum/EUR well, to near the Blades well and finally to the Washington Parish Brooks #1 well**
- **The cross section illustrates consistent resistivity and thickness of the TMS reservoir/source; and the thick pre-TMS fracture barrier**



TUSCALOOSA MARINE SHALE OIL POTENTIAL CROSS SECTION A-A'





- **A reservoir engineering analysis of more than 25 Tuscaloosa Marine Shale wells was conducted and a type curve for the eastern TMS play was developed.**
- **Producing wells exhibit initial hyperbolic decline typical of a dual porosity system reservoir**
 - The type curve has initial decline of 98% and a “b” exponent of 1.3; the better wells may outperform the type curve
- **Reserves modeled are 632 MBO with some gas and an initial production rate of 1,200 BOPD**
- **Economics to the working interest owner are favorable with an IRR of 50%, NPV10 of \$6.6 MM, ROI 2.4 and payout of 1.7 years for a 75% NRI lease**
- **Other economic assumptions are outlined in the next slide and include:**
 - \$9 MM drill and complete on development basis
 - OPEX of \$2,500/well/month and \$5.02/BBL
 - Severance tax 12.5% with 20-month holiday
 - Commodity prices: \$56.50/BBL and \$2.40/MCF

TMS Type Curve and Economics



TUSCALOOSA MARINE SHALE PRODUCTION MODEL

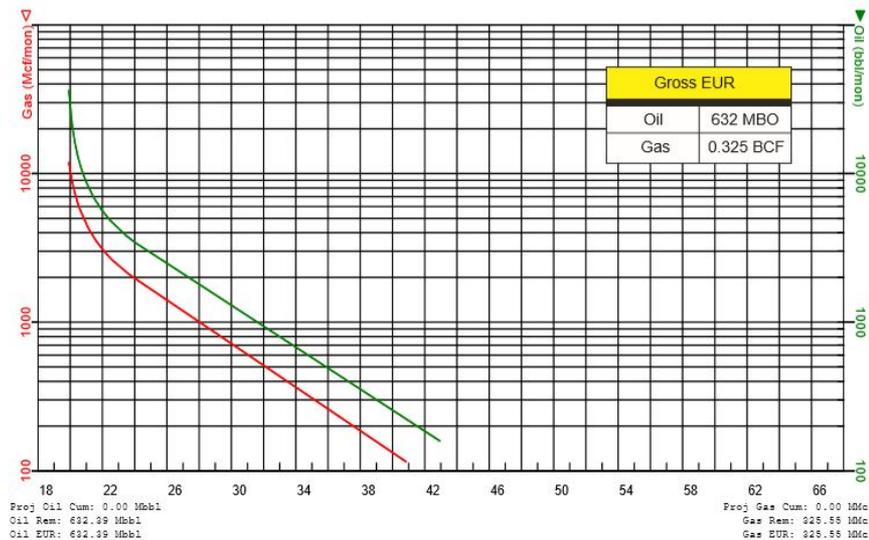
D&C \$M	Pv10 \$M	Payout Years	IRR	ROI	*Reserves MBO
\$9,000	\$6,604	1.7	50%	2.4	632

Effective Date	9/1/2019
Spud-to-Comp	30 days
Spud-to-Prod	60 days
WI	100%
NRI	75%
IP	1,200 BOPD
	0.325 BCF
	No NGL Modeled
b Factor	1.3
D Initial	98%
D Final	15%
Q Final	5 BOPD
BTU	1000 BTU/SCF
Gas Shrinkage	NA
EUR	632 MBO
Well Cost	9 \$MM
Opex	+2,500 \$/month + \$5.02/bbl
Severance Tax	12.5% (20 month holiday)
Ad Valorem	NA
Price Oil	56.50 \$/Bbl
Price Gas	2.40 \$/Mcf

Case Name: TMS Type Well
 Oil EUR: 632.99 Mbbbl
 Gas EUR: 325.55 MMcf

Oil Gas

Disc Value: 6,604.99 M\$
 IPOR: 49.90 %
 ROI: 2.39 to 1



*Based on characteristics of more than 25 TMS wells in MS & LA, and more recent completions by Australis & Goodrich

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