



From Deed to Bank

Valuing Mineral and Royalty Interests

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**Fort Worth Association of
Professional Landmen**

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About the Presenter



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Bryce leads Mercer Capital's Oil & Gas Industry Group. He is a regular contributor to Mercer Capital's blog, *Energy Valuation Insights* and the Energy sector of *Forbes.com* addressing valuation and economic trends in the oil & gas industry. He has over 20 years of oil and gas industry and valuation experience both in the U.S. and internationally. He has presented on upstream, mineral and royalty valuation issues on multiple occasions.

Bryce provides oil and gas companies, midstream operators, and oilfield servicers, as well as mineral & royalty owners, with corporate valuation, asset valuation, litigation support, transaction and due diligence advisory, and other related services.

Putting A Number On It:

How to Value a Mineral Interest

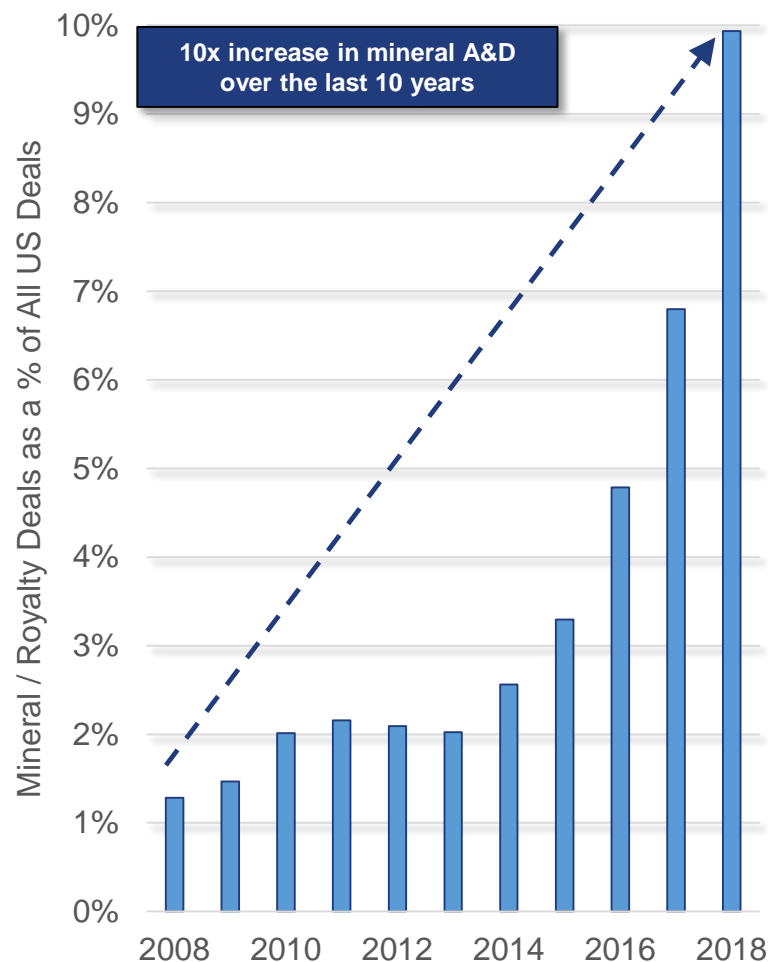
- Overview of Mineral Space & Value Considerations
- Methodologies: Different Interests – Different Methods
- DCF Dashboard
- Examples

Mineral / Royalty A&D Trends Over Time

Timeline

<p>2004 – 2011: Highly Diversified Packages</p>	<ul style="list-style-type: none"> ❑ E.g. - 5 states, 50 counties, 5,000 wells ❑ Flat production profile / conventional ❑ Traded on a cash flow multiple
<p>2012 – Mid 2014: Emergence: Minerals in Unconventional Basins</p>	<ul style="list-style-type: none"> ❑ Bakken minerals enter the picture ❑ DCF analysis more important as buyers model all future locations ❑ PDP now only a piece of the equation ❑ Midland and Delaware mineral positions quietly aggregated
<p>Mid 2014 – Mid 2017: Delaware / Midland Basins Change Mineral Landscape</p>	<ul style="list-style-type: none"> ❑ Enter Viper / changed the game ❑ \$/acre valuations / minimal cash flow ❑ Acreage flips prevalent ❑ No historical cadence for operators ❑ Limited data for type curve development
<p>Mid 2017 – Present: Buyer Sophistication Reaches New Heights / Valuations Impacted</p>	<ul style="list-style-type: none"> ❑ Ground game increasingly difficult ❑ Attention focused on next 12-24 mo. CF ❑ Future development cadence driving valuations ❑ Operator matters ❑ Well-defined type curves on proven benches

Historical Mineral / Royalty A&D Activity



What Are Mineral Interests?

“

The ownership of all rights to gas, oil, and other minerals at or below the surface of a tract of land

– U.S. Mineral Exchange

Why Do Minerals Transact?

THE OWNERSHIP TRANSFER MATRIX	
VOLUNTARY (THINGS YOU MAKE HAPPEN)	Sale to Outside Investor(s) Gifting Programs Asset Transfer Collateralization Liquidity Needs
INVOLUNTARY (THINGS THAT HAPPEN TO YOU)	Divorce Bankruptcy Death

- Asset Level (Entity considerations wouldn't be prudent at this juncture)
- Royalty / ORRI / Non-Producing Minerals
- Producing / Non-Producing

Considerations in Valuing Oil & Gas Interests

Summary of Treasury Reg 1.611-2(g) & GAAP Fair Value Standards

Considerations for an Oil and Gas Valuation		Other Necessary Items	
	Description		Description
Maps and descriptions of property	Number of acres by reserve type		
History of the property	Lease terms Date of initial acquisition and cost basis Cost of mineral improvements	Sales history	Revenue generated from reserves over the last five years
Valuation date		Historical oil and gas prices	Important in understanding benchmark price differentials
Accounting information	Allocation of value and/ or cost to the mineral property and property improvements Method used to determine property improvements Depletion/depreciation expense details	Future NYMEX pricing	Important in estimating future cash flow
Reserve estimates	Break down of reserves by mineral type (oil, gas, NGL) Break down of reserves by classification (PDP, PDNP, PUDs) Other pertinent geological information		
Reserve characteristics	Number of producing zones and average depth of each		
Operating conditions	Changes in proration, flooding, vacuum, etc.		
Details regarding previous transactions	Including dates of transactions and the terms of the leases		
Interest characteristics	Type of interest (royalty, overriding royalty, working interest) Percent/fraction of interest owned		
Well descriptions	Number of wells, date of completions, and/ or abandonment Annual production per well per day		
		Fair Value (GAAP)	ASC 820
		Standard	“The amount at which an asset (or liability) could be bought (or incurred) or sold (or settled) in a current transaction between willing parties, that is, other than in a forced or liquidation sale.”
		Proven Reserves:	Typically the discounted cash flow method
		Unevaluated Acreage:	Typically the comparable transaction method

Considerations in Valuing Oil & Gas Mineral Interests

Asset-Based Approach

Adjusted Book Value:
Typically not employed when valuing mineral interests. Sometimes can be used to adjust book value on a portfolio.

Income Approach

Discounted Cash Flow (DCF):
Analysis informed by business and industry trends

Lease Bonus method:
Occasionally utilized for non-producing inactive acreage

Market Approach

Comparable Transaction Method: (i) Multiples of RMR, (ii) \$ per acre, (iii) production multiples, etc.

Guideline Public Company Method: Public yields and implied metrics

Producing – PDP:

- Income - DCF
- Market - Comparable Transactions

Non-Producing – Probable / Possible:

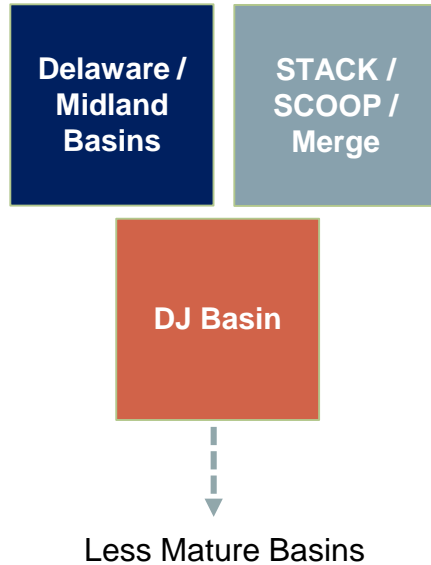
- Income - DCF
- Income/Market Hybrid - Lease Bonus Method

Non-Producing – PUD's:

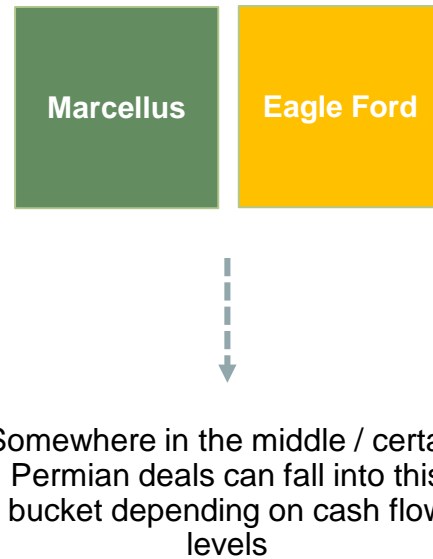
- Income - DCF
- Market - Comparable Transactions

General Methodologies by Basin

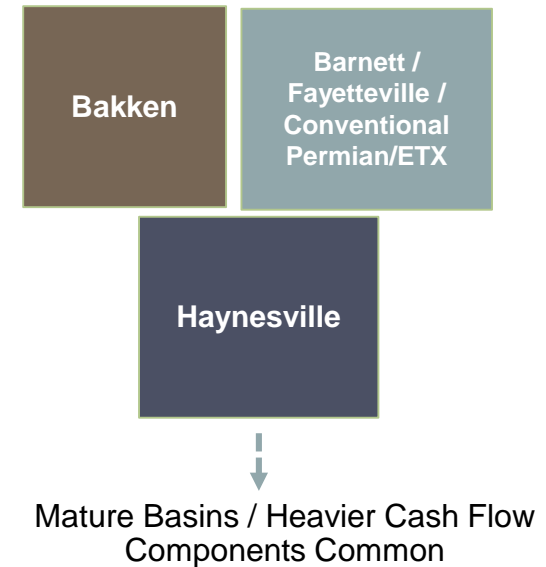
NAV / DCF Analysis



Blended



Yield Driven Valuations



Delaware / Midland Valuations

PDP PV8-10, +
 DUC PV12-15, +
 Permit PV15, +
 PV20-30 for 1-3 benches developed over a 10-year period (varies by location)

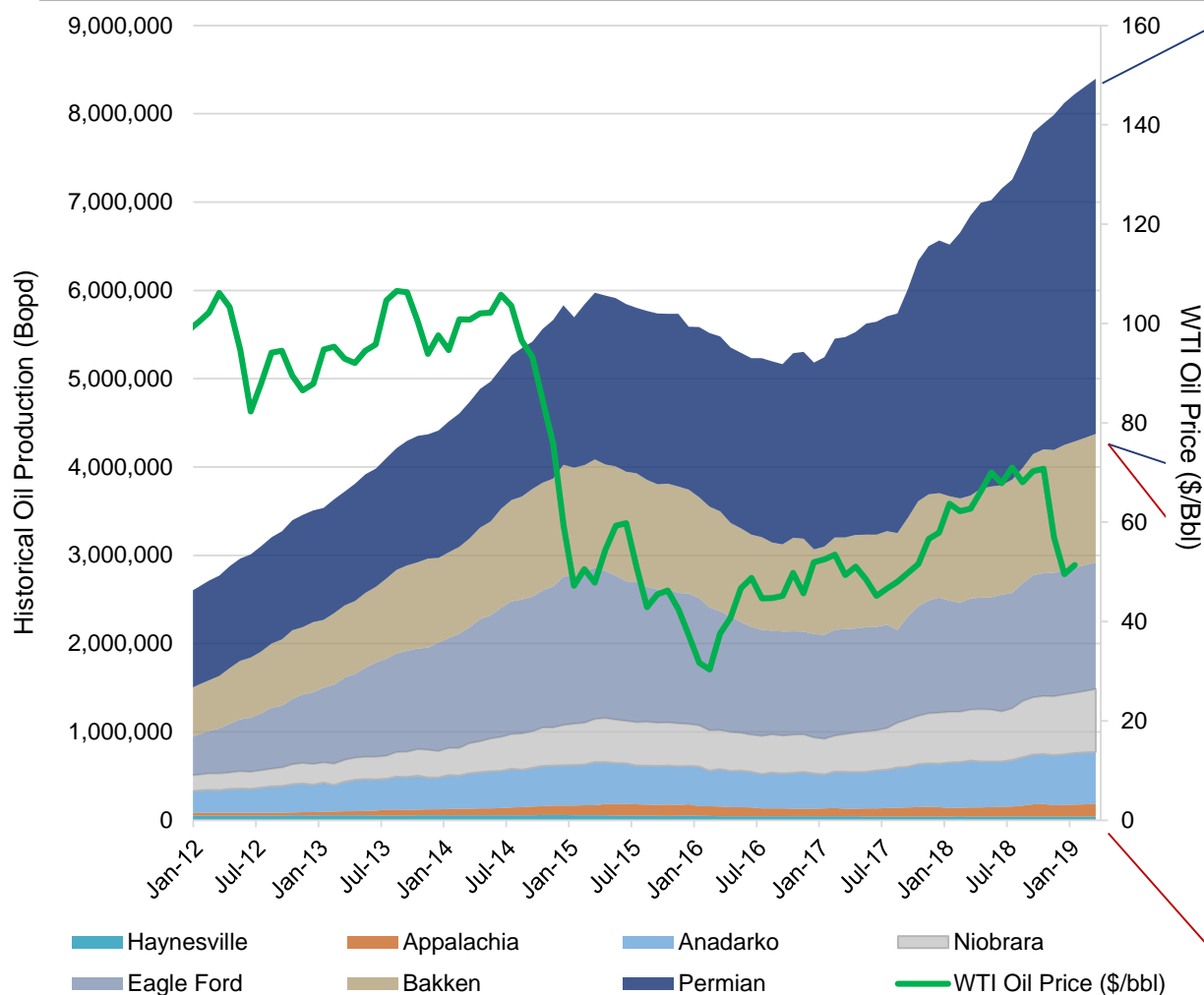
Eagle Ford

\$25k - \$35/NRA in core areas with strong cash flow and near term development by key EF operators
 PV20-30 for 1 EF bench at proven spacing / value for Chalk assessed on a unit by unit basis
 10-12% yield (FTM cash flow)

Bakken

Core mineral packages with strong upside can trade at 9x-12x FTM cash flow
 Value received for Bakken and 1 Three Forks bench / operator is key
 \$/acre valuations typically don't play a role in a sale process

Why the Valuation Approach Differs in the Permian vs. Other Plays: Basin Lifecycle



- ❑ The best way to accurately value and account for the Permian's rapid growth: thoughtful NAV analysis
- ❑ Near-term yield is important, but the presence of multiple proven benches and pad drilling makes the long-term development plan a critical value component

- ❑ Year-over-year growth notably more gradual in other basins
- ❑ This results in more yield-driven valuations whereby the next 12-24 months of forecasted cash flow is the key determinant of value

Methodology Comparisons

Good Comparable Transactions are Best (But Can Be Rare) – Otherwise the DCF is Prominent

DCF: (SPEE says its most utilized method)

- Strength: is the purest and most intrinsic method but may not always be the best method
- Weakness: lots of assumptions

Comparable Transactions & Guideline Public Data:

- Strength: Simple and Relevant
- Weakness: Devil is in the details and what is a “comparable”?

Interplay:

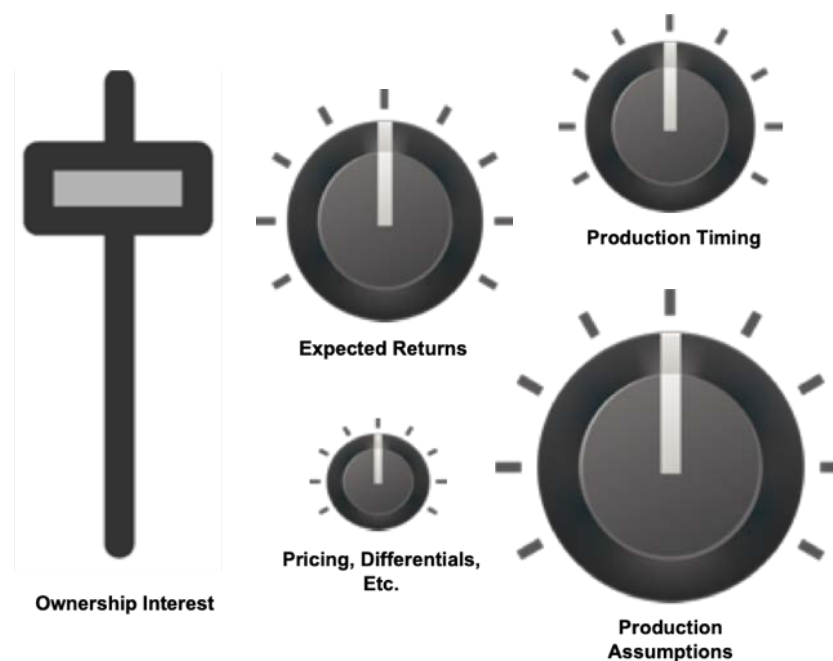
- Methods and inputs have symbiotic and interchangeable relationships to each other and can/should be tested against each other for reasonableness
 - Public Yields / Returns
 - Implied Pricing Metrics

DCF “Dashboard”

Critical Inputs To A Mineral Oriented Discounted Cash Flow Model

5 Key Component Areas and Assumptions:

1. Ownership Interest
2. Production Oriented Assumptions
3. Pricing / Differentials / Post-Production Deductions
4. Expected Returns
(PDP / DUC-Permits / P2-P3)
5. Timing of Production / Drilling
(PDP / DUC-Permits / P2-P3)



Ownership Interests

Know What You Own (Or What You're Buying)



Ownership Interest

- Deed
- Lease
- Pooling
- Division Orders
- Net Revenue Interest
- “Cleanliness” of Title



Knowledge is Value: Know Your Assets

Valuation Questions in Today's Mineral Space

- How are you converting NMAs to NRAs?
- What is the current cash flow and what do the next 1-3 years look like?
- In the same breath, what is your total DUC and Permit Count?
- Can you walk me through your historical and forecasted development timing?
- Does your acreage support long-lateral development
- For both the Delaware and Midland Basins, who are my operators?
- Can you explain your type curve methodology?
- What's your average tract size?
- What do your permit-to-spud and spud-to-completion times look like by operator?

Production Assumptions

Estimating What & How Much to Value

PDP:

- Location on Decline Curve?
- What is Overall Decline Curve?
- Production Issues?

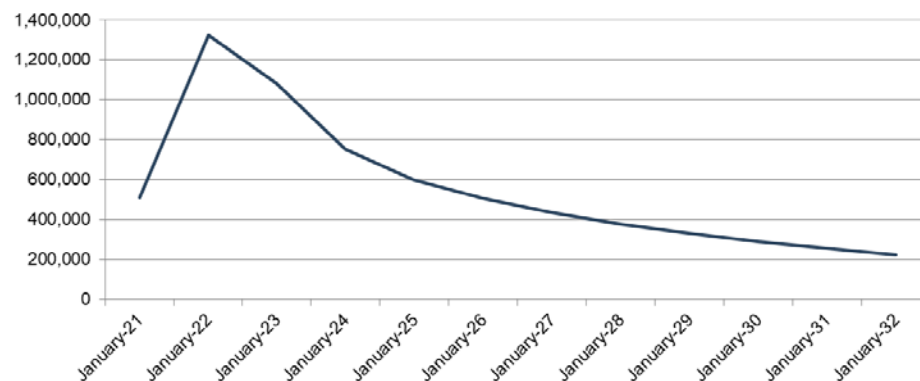
PUD's: (critical analysis is lynchpin)

- Comparable activity
- DUC's / Permits
- Well Spacing / Operator / Parent-Child
- I.P. rates
- Decline curve
- Mix of hydrocarbons

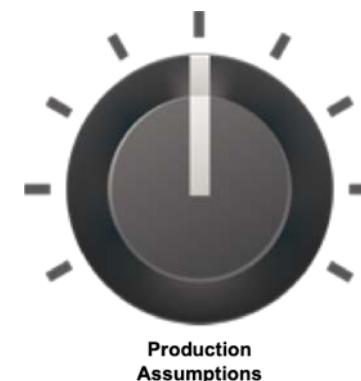
Probable / Possible:

- Wilderness of Uncertainty
- Diminishing Acreage Values? (Market / Lease Bonus Method)

Oil Production (MBBLS)



0	0	0	8	8	7	2	1	7	1	3	18
1	1	1	3	1	0	0	2	5	4	4	0
7	4	6	9	2	1	8	3	10	11	6	1
1	4	8	29	7	1	4	7	2	13	9	3
4	6	10	4	8	2	5	9	3	3	5	8
6	14	17	21	5	1	2	0	6	6	5	4
7	7	16	2	4	17	8	4	2	1	5	2
12	14	17	30	16	0	1	0	4	4	2	0
6	13	6	7	8	6	4	7	20	14	6	1
18	5	8	7	7	1	0	2	2	15	8	0
24	8	18	7	7	13	2	1	17	0	5	9
3	1	6	22	11	21	13	15	0	1	1	2



Pricing Assumptions

What Do I Get For What I Produce?

Where to Begin

- NYMEX?
- Local Pricing? (Midland Argus)

Differentials

- Infrastructure / Transportation
- Water Issues
- Other Issues

Post-Production Deductions

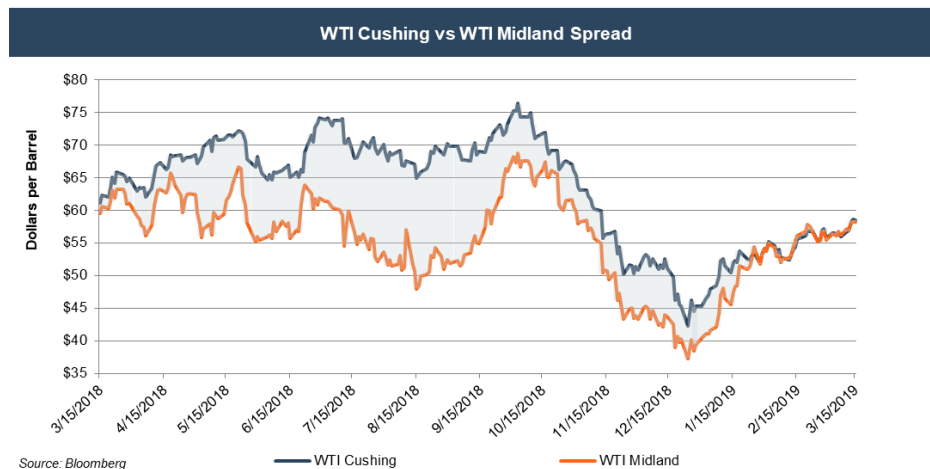
- Lease issues

Check Stub

- Always correct?



Pricing, Differentials,
Etc.



PROPERTY NUMBER				PROPERTY NAME			COUNTY	STATE			
T	P	MO	YR.	UNIT PRICE	BBLs OR MCF	GROSS VALUE	BTU FACTOR	SEV/PROD TAX	NET VALUE		
				YOUR DECIMAL	YOUR BBLs OR MCF	YOUR GROSS		YOUR SEV/PROD TAX	YOUR OTHER W/H	YOUR NET	
*	*	**	**	1 W 0012345	2 SMITH	1	3 ROBERTSON	4 TX			
5 G	09	05	8	9.23	9 9841.38	10 90902.08	11 9785	12 4352.22-	13 85202.38		
14 R	6	7	15	012013360	16 118.22	17 1092.04	18 52.29-	19 10.53-	19 1029.22		
					SAMPLE		TRANSPORTATION OKLAHOMA WITHHOLDING TAX				
YOUR TOTALS					21	1092.04		52.29-	10.53-	1029.22	
PRODUCT				OWNER TYPE: W - WORKING R - ROYALTY O - OVERRIDE				OWNER NAME		CHECK NO.	25
O - OIL H - HELIUM G - GAS F - FUEL R - RESIDUE				C - CONDENSATE N - NET PROFITS P - PLANT PRODUCT I - CARBON DIOXIDE L - NATURAL GAS LIQUIDS				22 MR & MRS SMITH 123 ANY STREET ANYWHERE, OK 78602		23 999999	24 04/20/06
810 HOUSTON ST. - FORT WORTH, TEXAS 76102-4598 959-996-2613				XTO ENERGY INC.				DETACH AND RETAIN THIS STATEMENT FOR TAX PURPOSES. DUPLICATES CANNOT BE FURNISHED		12345	

Expected Returns

Risk & Returns Increase as They Go Down the Certainty Scale

Mineral Interest Expected Return Parameters		
Royalty and ORRI	Discount Rate Ranges	Sources
PDP	7%-10%	- Market transactions - Public yields
Non-Producing:		
DUC	12% - 15%+	- Mineral aggregator returns & Implied Transaction Pricing
Permit	15%+	- Market place transactions
Undeveloped	20%-80% (Avg. 30%-40%)	- Implied Transaction Pricing & SPEE Survey*

**While the SPEE Survey applies primarily to working interests, these published ranges generally hold consistent with rates observed in mineral interest discounts.*



Expected Returns

Expected Returns: Commentary

Why are PDP Royalties Less Than PV10? Simple: Less Risk

PDP:

Shared Risks with Working Interests:

- Price volatility risk
- Geologic risk
- Decline curve (Depletion) risk
- Infrastructure risk

Non-Shared Risks:

- Fewer liability risks
- No operating expense risk
- No plugging & abandonment risk
- Other

Pure royalty/minerals retain ownership while W.I. operates under a lease (ORRI typically does not);

Non Producing:

More Volatility = Higher Discount Rate

- Lower end of discount rate range for:
 - DUC's
 - Permits
- Higher returns a function of uncertainty:
 - Title "Cleanliness"
 - Operator profile
 - Drilling trends
 - Field maturity
 - Other

Cadence: Timing Assumptions Are Critical

1. DUCs and Permits

- Common theme in mineral buyer investor presentations: “visible production growth”
- Typical development schedule has DUCs and Permits coming online in the first 12-18 months

2. Location Timing

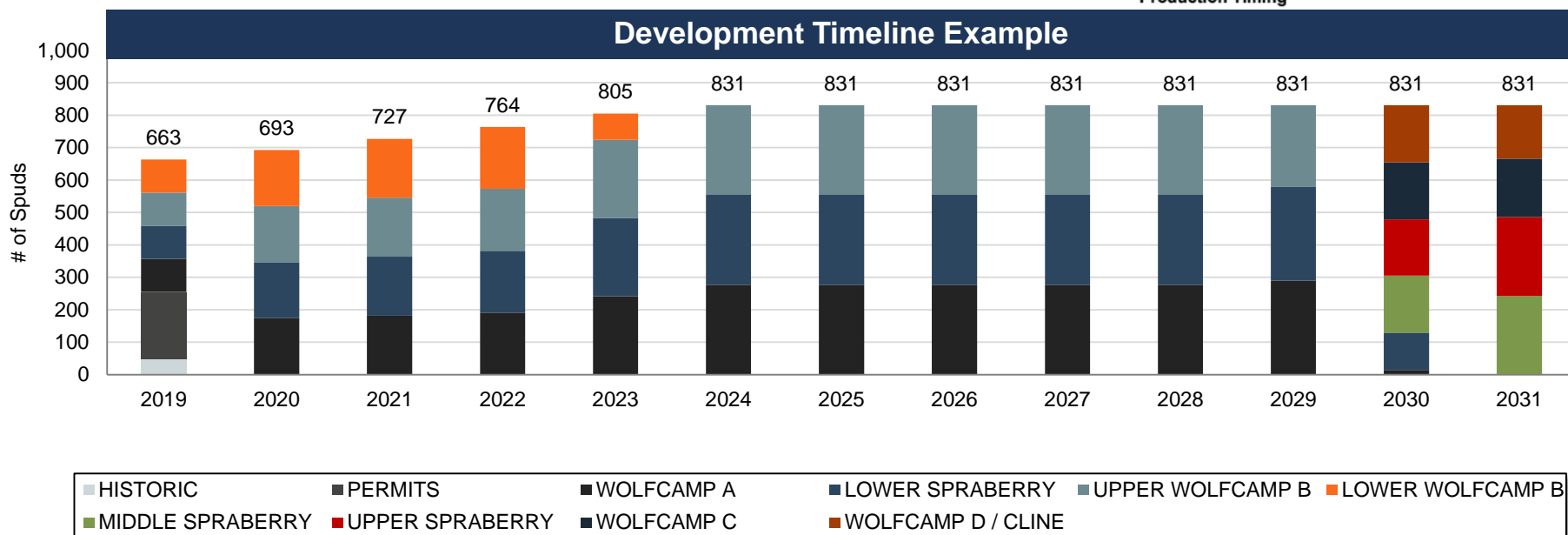
- Most proven, delineated benches are scheduled first
- Small adjustments to this development program = wide variations in valuation

3. Location Scheduling

- Order of locations has significant impact on value
- Show realistic sensitivities to create a potential high, mid, and low case future cash flow profile



Production Timing



Holding Period Timing

Your IRR is Waiting...

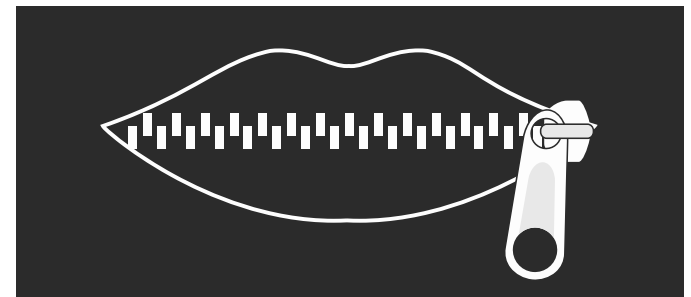
12-18 Months? Longer?

Operator Disclosure

- Capex budget variance

Core vs. Non-Core Acreage

- DCF Sensitive To This

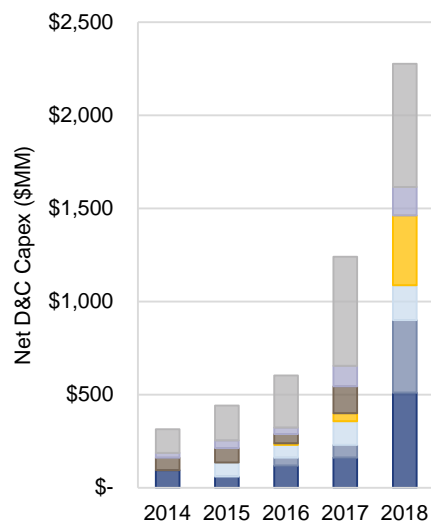
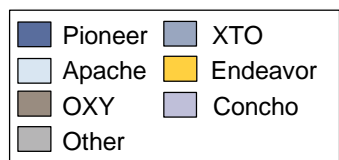
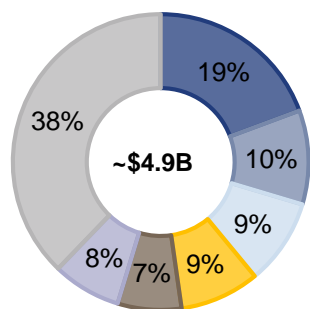


Operator Prominently Factored into the Timing/Cadence Equation

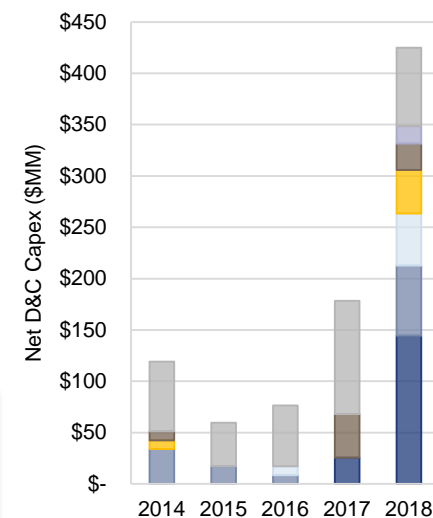
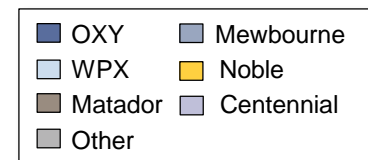
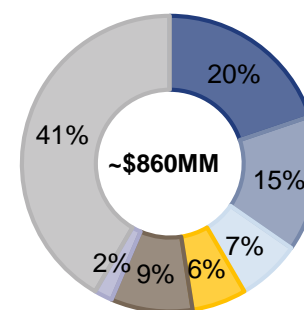
- Mineral buyers scrutinizing operators of their acquisition targets more than ever
- Common theme in mineral buyer investor presentations: “competent operators”, “high-quality operators”
- Buyers are analyzing an operator’s total capital budget for a basin vs. what that operator spent on their acquisition target’s position in that basin

Example - Operator Capex Analysis

Midland Basin



Delaware Basin



PUD Example – Delaware Basin

- Investor decks from operators in region also in early stage helps to determine production profile
 - 24-Hour IP Rates, IP-30, and 8 month cumulative production used to extrapolate year 1 production
- Rely on regional research or engineering report to estimate decline rate
- Well-spacing drives number of wells on the subject area (varied widely in this example)
- Local pricing discussions and investor decks were useful for determining pricing differentials
- Discount rate based on implied transaction prices among other sources
- No permits yet. Model very sensitive to timing assumption at a 20% discount rate

Projected Future Cash Flows		February-21	February-22	February-23	February-24	February-25	February-26
Net Cash Flow		\$462,532	\$1,161,023	\$924,297	\$638,945	\$506,869	\$432,257
Discounting Periods		1.50	2.50	3.50	4.50	5.50	6.50
Discount Factor	20%	0.76	0.63	0.53	0.44	0.37	0.31
Present Value of Cash Flow		\$351,860	\$736,017	\$488,289	\$281,286	\$185,951	\$132,149

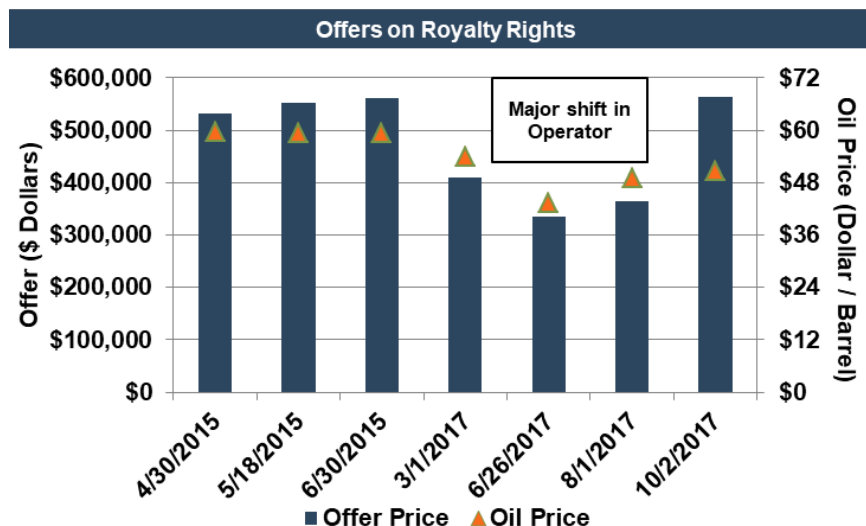
		February-27	February-28	February-29	February-30	February-31	February-32
Net Cash Flow		\$374,077	\$325,732	\$285,048	\$251,047	\$221,538	\$195,172
Discounting Periods		7.50	8.50	9.50	10.50	11.50	12.50
Discount Factor	20%	0.25	0.21	0.18	0.15	0.12	0.10
Present Value of Cash Flow		\$95,302	\$69,154	\$50,431	\$37,013	\$27,218	\$19,983

Terminal Value

Year 12 Cash Flow	\$195,172
x Expected Terminal Decline Rate	-12.00%
Ongoing Cash Flow	\$171,752
Discount Rate	20.00%
- Terminal Growth Rate / + Decline	12.00%
Terminal Capitalization Rate	32.00%
Terminal Capitalization Factor	3.13
Indicated Terminal Value	\$536,724
Discount Factor	0.10
Present Value of Terminal Value	\$54,952
Sum of Present Value of Discrete Cash Flows	\$2,474,653
+ Present Value of Terminal Value	54,952
Indicated Value	\$2,529,605
Indicated Value: DCF Analysis	\$2,529,600
Implied \$/NMA	\$15,810

PDP Example – West Texas

- Similar DCF framework for PDP
- Historical wellhead pricing helps to determine differential
- Historical production and regional research determine decline rate
- Discount rate & “OpEx” / monitoring costs derived using public royalty trusts in the Permian Basin (PBT and Cross Timbers) as a starting benchmark
- Client received numerous unsolicited offers over time \$365k - \$563k
- Our valuation was ~double @ \$1.1M
 - \$44,160 / NMA
 - 120x Monthly Check stub
- Client then opts to sell via online auction
- Received modest premium to our value



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
Owner's Revenue							
Well #1	\$14,284	\$12,910	\$11,935	\$11,268	\$10,833	\$10,532	
Well #2	42,471	38,386	35,487	33,505	32,210	31,317	
Well #3	69,383	62,710	57,975	54,736	52,620	51,161	
Well #4	223	229	220	216	214	213	
Total Owner's Revenue	\$126,361	\$114,235	\$105,617	\$99,726	\$95,877	\$93,223	
- Owner's Taxes ¹	4.50%	(\$5,686)	(\$5,141)	(\$4,753)	(\$4,488)	(\$4,314)	(\$4,195)
Total Owner's Revenue, Net of Production Taxes	\$120,675	\$109,095	\$100,864	\$95,238	\$91,563	\$89,028	
- Annual Owner Expenses ²	5.00%	(\$6,318)	(\$5,712)	(\$5,281)	(\$4,986)	(\$4,794)	(\$4,661)
Net Cash Flow	\$114,357	\$103,383	\$95,583	\$90,252	\$86,769	\$84,367	
Discounting Periods	1.00	2.00	3.00	4.00	5.00	6.00	
Discount Factor	7.00%	0.93	0.87	0.82	0.76	0.71	0.67
Present Value of Cash Flow	\$106,875	\$90,299	\$78,024	\$68,853	\$61,865	\$56,217	

Sum of Present Value of Discrete Cash Flows	\$715,556
+ Present Value of Terminal Value	373,991
Indicated Value	\$1,089,548

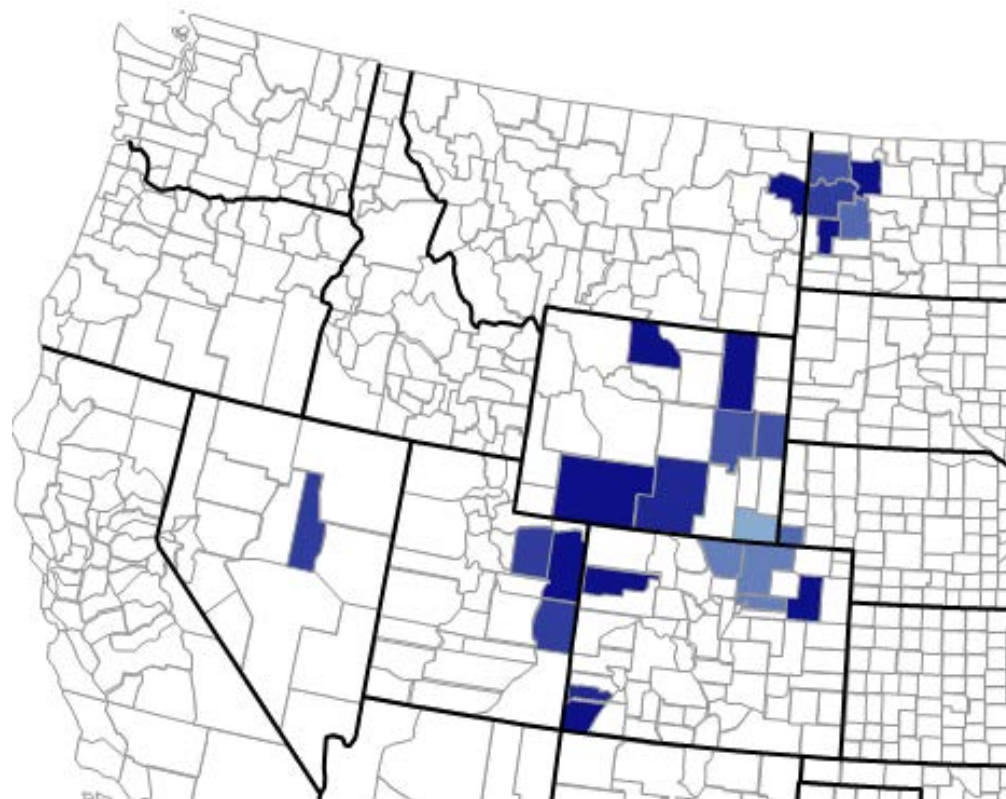
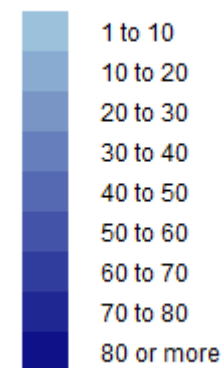
Indicated Value: DCF Analysis **\$1,090,000**

Example: Rockies Region – Smaller ORRI and Royalty Transactions

Transactions from 2017 – Early 2019



Average Multiple per County



Multiples of Monthly Revenues	
Average	55.38
Median	37.45
Minimum	8.95
1st Quartile	23.27
3rd Quartile	65.74
Maximum	603.73

About Mercer Capital

Mercer Capital provides business valuation and financial advisory services to royalty owners in the oil and gas industry.

Mercer Capital is a national business valuation and financial advisory firm. Offering a broad range of services, we have provided thousands of valuations, which are well-reasoned and thoroughly documented.

We understand the unique position of royalty owners as well as the broader energy industry. Whether in reaction to an event or for strategic planning purposes, Mercer Capital can help capture the value of your mineral rights.

Services Provided

- Valuation of oil and gas companies
- Transaction advisory for acquisitions and divestitures
- Valuations for purchase accounting and impairment testing
- Fairness and solvency opinions
- Litigation support for economic damages and valuation and shareholder disputes

Published quarterly, our [Exploration & Production Newsletter](#) provides an overview of the industry through supply and demand analysis, commodity pricing, and public market performance. In addition, each issue of this quarterly newsletter focuses on a region, including, Eagle Ford, Permian Basin, Bakken, and Appalachia, examining general economic and industry trends.

For an additional resource regarding the valuation of mineral royalty interests within the oil and gas industry, view our whitepaper, [How to Value an Oil & Gas Royalty Interest](#).

Questions?