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"Profitable Mineral Management"
BREAKFAST SERIES *for*
Surface and Mineral Owners
Admission by Invitation Only

DATE: **April 17, 2018**

TOPIC: **Oil & Gas Property Evaluation & Property Taxes on Mineral Interests**

LOCATION: **San Antonio Petroleum Club**
8620 N New Braunfels, Suite 700
San Antonio, TX 78217-6363
P 210.824.9014, F 210.829.5443

TIME: 7:30 AM Breakfast - 8:00 AM Presenters - 8:50 AM Questions & Answers

INTRODUCTIONS: **E.O. (Trey) Scott, III, Trinity Mineral Management, Ltd.**

PRESENTERS: **Keith Masters**

Oil & Gas Property Evaluation & Property Taxes on Mineral Interests

- Purposes of Evaluation
- Concept of Fair Market Value
  - Definition
  - Methods of Determination
- Income Forecast Method Procedure
  - Methods of Estimating Reserves
  - Reserves Category Definitions
  - Production Profiles
  - Price Forecasts
  - Cash Flow Analysis
- Property Taxes on Mineral Interests

Keith Masters

Masters Consulting, LLC

k_b_masters@mastersconsultingllc.com
512-906-2016

Keith B. Masters, P.E. is a consulting petroleum engineer. He holds a Bachelor of Science degree from The University of Texas, a Master of Engineering degree from Tulane University, and a Master of Business Education degree from St. Edwards University.

Keith has worked as a petroleum engineer for over 37 years, having been employed by Chevron U.S.A. and Don Ray George & Associates, Inc. prior to forming Masters Consulting, LLC in 2007. Masters Consulting provides a variety of petroleum engineering services, including oil and gas property evaluation, to a broad range of clients.

In addition to his consulting practice, Keith personally invests in oil and gas activities through Masters Energy, LLC and Masters Minerals, LLC.

Oil & Gas Property Evaluation
Property Taxes on Mineral Interests

Presented by: Keith B. Masters, P.E.

April 12, 2018

Masters Consulting

PURPOSES OF EVALUATION

- SEC Reporting
- Income Taxes
  - Cost Depletion
  - Basis Determination
- Acquisition or Sale
- Property Tax Assessment
- Estate Taxes
- Litigation

Requires Estimation of Fair Market Value

DEFINITION OF MARKET VALUE

The amount a willing buyer will pay a willing seller:

- with the property or interest exposed to an efficient market for a reasonable period,
- neither the buyer nor the seller being under a compulsion to buy or sell,
- and with both being competent and having reasonable knowledge of the facts.

ASPECTS OF MARKET VALUE

- Cannot be determined precisely
  - Subjective estimate; requires application of the experience and judgment of the evaluator
- Can be rationalized
  - Methodology is objective
  - Does not include speculative value

METHODS OF DETERMINING FAIR MARKET VALUE

- Replacement Cost Method
  - Does not apply because of unique aspects of properties
- Comparative Sales Method
  - Not widely used due to difficulty in identifying comparable sales
- Rule of Thumb Method
  - Does not explicitly consider the time value of money
- Income Forecast Method
  - Analytically superior if a reasonable forecast can be made

INCOME FORECAST METHOD

- Estimate and categorize reserves
- Develop production profile
- Project commodity prices
- Project capital and operating expenses
- Conduct discounted cash flow analysis
- Account for risk

METHODS OF RESERVES DETERMINATION

- Analogy
- Volumetrics
- Performance
  - Decline Curve Analysis
  - Material Balance
  - Numerical Simulation Models

RESERVES CATEGORY DEFINITIONS

- Proved Reserves - reasonable certainty
  - Proved Developed Producing (PDP)
    - recoverable from existing wells as currently producing
  - Proved Undeveloped (PUD)
    - require capital investment to enable production
- Probable Reserves (PROB) – more likely than not
- Possible Reserves (POSS) – less likely than probable

RESERVES ARE LIKE FISH

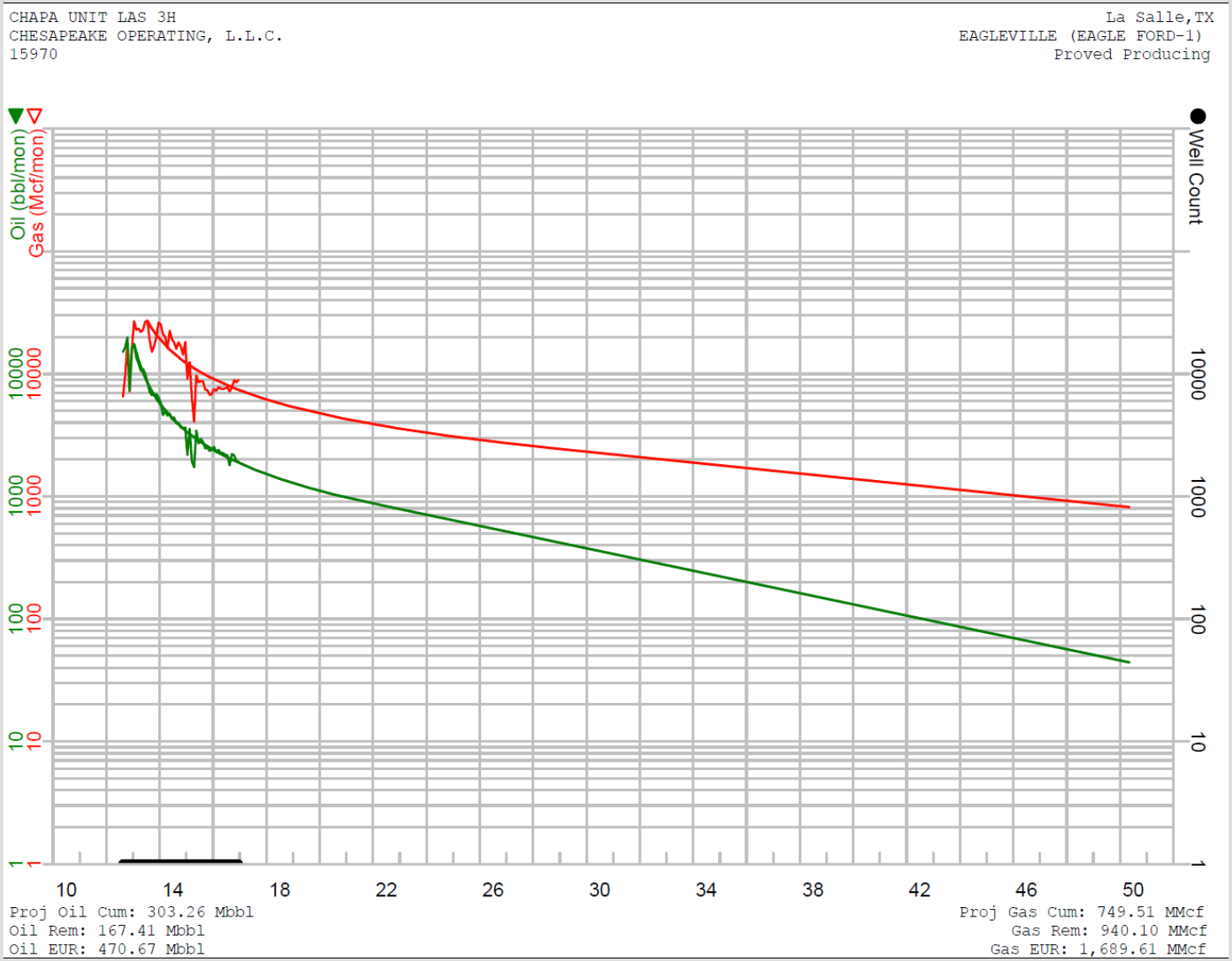
- Proved Developed
  - The fish is in the boat. You have weighed him. You can smell him and you will eat him.
- Proved Undeveloped
  - The fish is on your hook in the water by the boat and you are ready to net him. You can tell how big he looks (and they always look bigger in the water).
- Probable
  - There are fish in the lake. You may have caught some yesterday. You may even be able to see them, but you have not caught any today.
- Possible
  - There is water in the lake. Somebody may have told you there are fish in the lake. You have your boat on the trailer but you may go play golf instead.

PRODUCTION PROFILES

- Initial production rates are typically developed through analogy to existing wells
- Production rates typically decline as the reservoir is depleted
- Decline rates can vary widely in nature and value based on the expected depletion mechanism, the characteristics of the reservoir, and anticipated operating conditions

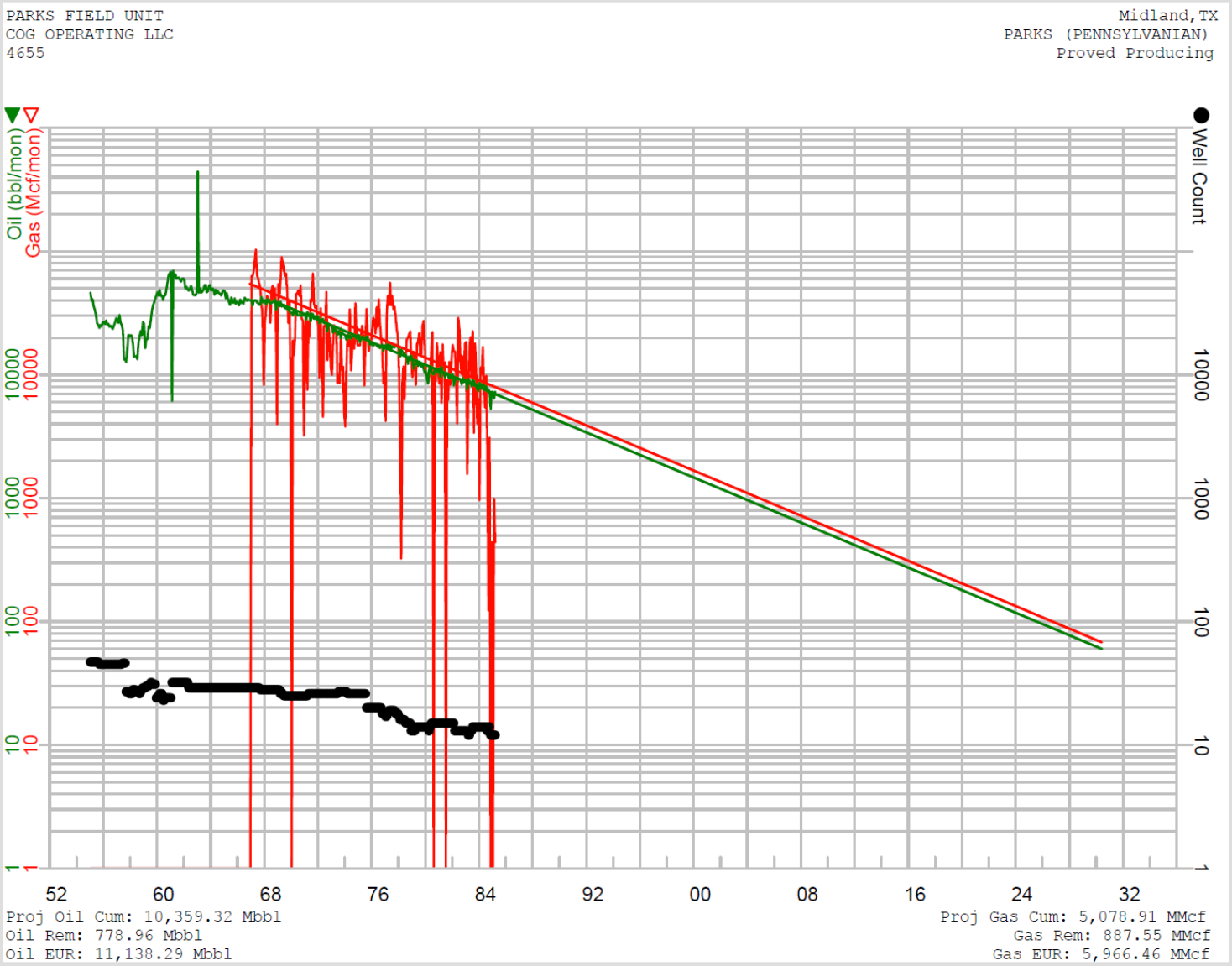
EXAMPLE PRODUCTION PROFILE

Eagleford Well



EXAMPLE PRODUCTION PROFILE

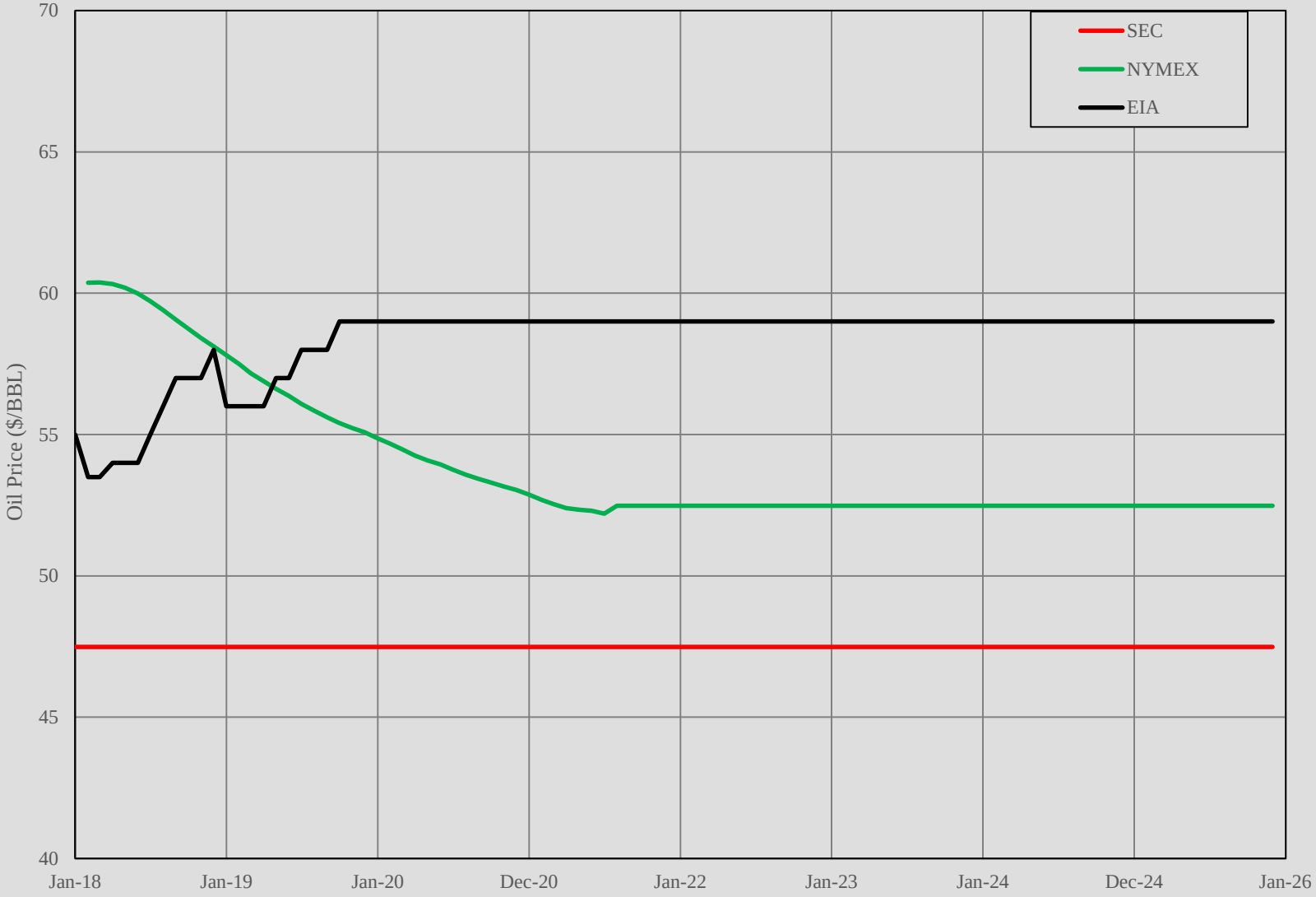
West Texas Secondary Recovery Unit



PRICE FORECASTS

- SEC Pricing Guidelines
  - Average index price on the first day of the month for the preceding year
- EIA Price Forecasts
  - Short term forecasts published monthly by the Energy Information Agency of the Department of Energy
- NYMEX Futures Prices
  - Futures Contracts traded on the New York Mercantile Exchange
- Other Forecasts
  - Developed by large corporations, banks, speculators

OIL PRICE FORECAST COMPARISON



DISCOUNTING

- Accounts for time value of money.
- Risk-free discount rate should reflect the cost of capital or opportunity loss.
- SEC guidelines call for application of a 10% discount rate.
- SEC rate is applied in many other situations as a “default” value.
- Discount rate is typically adjusted upwards to account for risks in estimating market value.

Date : 03/30/2018 4:52:33PM

ECONOMIC PROJECTION

As Of Date : 01/01/2018
Discount Rate (%) : 10.00
EFS Well

Project Name : Typical EFS
Partner : All Cases
Case Type : LEASE CASE
Archive Set : default

Case : EFS Well
Reserve Cat. : Proved Producing
Field : Eagle Ford
Operator :
Reservoir :
Co., State : ,

Cum Oil (Mbbl) : 0.00
Cum Gas (MMcf) : 0.00

Year	Gross Oil (Mbbl)	Gross Gas (MMcf)	Net Oil (Mbbl)	Net Gas (MMcf)	Oil Price ($/bbl)	Gas Price ($/Mcf)	Oil Revenue (M$)	Gas Revenue (M$)	Misc. Revenue (M$)
2018	128.50	189.69	32.13	33.19	57.00	6.00	1,831.19	199.17	0.00
2019	44.76	76.07	11.19	13.31	57.00	6.00	637.78	79.87	0.00
2020	27.86	50.94	6.96	8.91	57.00	6.00	397.00	53.48	0.00
2021	20.20	38.83	5.05	6.80	57.00	6.00	287.86	40.77	0.00
2022	15.89	31.73	3.97	5.55	57.00	6.00	226.40	33.32	0.00
2023	13.10	26.98	3.27	4.72	57.00	6.00	186.63	28.33	0.00
2024	11.17	23.62	2.79	4.13	57.00	6.00	159.17	24.80	0.00
2025	9.69	20.96	2.42	3.67	57.00	6.00	138.11	22.01	0.00
2026	8.58	18.92	2.14	3.31	57.00	6.00	122.26	19.87	0.00
2027	7.69	17.28	1.92	3.02	57.00	6.00	109.59	18.14	0.00
2028	6.94	15.96	1.73	2.79	57.00	6.00	98.89	16.76	0.00
2029	6.23	14.77	1.56	2.58	57.00	6.00	88.76	15.51	0.00
2030	5.61	13.79	1.40	2.41	57.00	6.00	79.89	14.48	0.00
2031	5.05	12.95	1.26	2.27	57.00	6.00	71.90	13.60	0.00
2032	4.55	12.24	1.14	2.14	57.00	6.00	64.88	12.85	0.00
Rem	34.19	135.28	8.55	23.67	57.00	6.00	487.19	142.04	0.00
Total	**350.00**	**700.00**	**87.50**	**122.50**	**57.00**	**6.00**	**4,987.50**	**735.00**	**0.00**
Ult	**350.00**	**700.00**							

Year	Well Count	Net Tax Production (M$)	Net Tax AdValorem (M$)	Net Investment (M$)	Net Lease Costs (M$)	Net Well Costs (M$)	Other Costs (M$)	Net Profits (M$)	Annual Cash Flow (M$)	Cum Disc. Cash Flow (M$)
2018	1.00	99.46	50.76	0.00	0.00	0.00	0.00	0.00	1,880.14	1,809.25
2019	1.00	35.43	17.94	0.00	0.00	0.00	0.00	0.00	664.28	2,385.69
2020	1.00	22.34	11.26	0.00	0.00	0.00	0.00	0.00	416.88	2,713.96
2021	1.00	16.35	8.22	0.00	0.00	0.00	0.00	0.00	304.07	2,931.45
2022	1.00	12.95	6.49	0.00	0.00	0.00	0.00	0.00	240.27	3,087.62
2023	1.00	10.74	5.37	0.00	0.00	0.00	0.00	0.00	198.84	3,205.09
2024	1.00	9.21	4.60	0.00	0.00	0.00	0.00	0.00	170.17	3,296.45
2025	1.00	8.03	4.00	0.00	0.00	0.00	0.00	0.00	148.09	3,368.72
2026	1.00	7.13	3.55	0.00	0.00	0.00	0.00	0.00	131.44	3,427.03
2027	1.00	6.42	3.19	0.00	0.00	0.00	0.00	0.00	118.12	3,474.66
2028	1.00	5.82	2.89	0.00	0.00	0.00	0.00	0.00	106.94	3,513.87
2029	1.00	5.26	2.61	0.00	0.00	0.00	0.00	0.00	96.40	3,545.99
2030	1.00	4.77	2.36	0.00	0.00	0.00	0.00	0.00	87.24	3,572.42
2031	1.00	4.34	2.14	0.00	0.00	0.00	0.00	0.00	79.02	3,594.18
2032	1.00	3.96	1.94	0.00	0.00	0.00	0.00	0.00	71.84	3,612.17
Rem.		33.15	15.73	0.00	0.00	0.00	0.00	0.00	580.35	82.34
Total		**285.35**	**143.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5,294.09**	**3,694.51**

Major Phase : Oil
Perfs : 0 - 0
Initial Rate : 28,610.00 bbl/month
Abandonment : 58.85 bbl/month
Initial Decline : 99.00 % year b = 1.000
Beg Ratio : 1.387
End Ratio : 6.959

Abandonment Date : 3/1/2050
Working Int : 0.00000000
Revenue Int : 0.25000000
Disc. Initial Invest. (M$) : 0.00
ROInvestment (disc/undisc) : 0.00 / 0.00
Years to Payout : 0.00
Internal ROR (%) : 0.00

Present Worth Profile (M$)

PW	**5.00% :**	**4,269.26**
PW	**10.00% :**	**3,694.51**
PW	**15.00% :**	**3,323.13**
PW	**20.00% :**	**3,059.07**
PW	**25.00% :**	**2,858.74**
PW	**30.00% :**	**2,699.73**

RISK CATEGORIES

- Economic Risk
  - Price or expense fluctuations, interest rate fluctuations
- Political Risk
  - Taxation, confiscation
- Reserves risk
  - Estimation error, mechanical problems

RISK ASSESSMENT

- Most subjective element of estimating fair market value.
- Economic and political risks are usually accounted for through use of a risk-adjusted discount factor.
- Reserves risk can be addressed through additional discounting or through use of reserve adjustment factors, which vary according to reserves category.

TYPICAL RISK-ADJUSTED DISCOUNT RATES

Reserves	Royalty Interest		Working Interest	
Category	Low	High	Low	High
PDP	10	15	15	20
PUD	20	30	25	35
PROBUD	25	40	30	50

NOTE: These are GENERAL guidelines.

PROPERTY TAXES ON MINERAL INTERESTS

- Notice of Appraised Value
  - Typically done by a contractor hired by Central Appraisal District.
  - Value is the estimated market value as of the first day of the year.
- Taxpayer Protests
  - Formal protest **may** be avoided through direct communications with the appraiser.
  - Formal hearings are decided by Appraisal Review Board (ARB) which is appointed by Central Appraisal District.
  - Appeals of ARB decisions can be made in District Court.

GENERAL OBSERVATIONS

- Quality of appraisals is inconsistent
  - Appraisers have varying levels of expertise.
  - High volume of properties to be appraised requires generalization and automation.
  - In general, newly drilled wells are more often overvalued than older wells.
- Taxpayer Protests
  - Informal “protests” have achieved mixed results.
    - Operators have more influence than royalty owners.
    - Operators are often not as proactive as they might be.
  - Formal protests have achieved poor results.
    - ARB decisions are biased towards high valuations. (My opinion)