

REVIEW OF CONVENTIONAL OIL AND GAS TERMS OF ALBERTA

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Pedro van Meurs

Important note:

This report is being provided to the Department of Energy under a consulting contract with Pedro Van Meurs.

The report provides an evaluation of the conventional oil and gas fiscal terms in Alberta and a comparison with some of the Lower 48 US States. The report represents the findings, analysis and interpretation of the author and does not necessarily reflect the views of the Minister of Energy or Department of Energy.

It is intended to provide additional information for consideration by the Royalty Review Panel.

The Department of Energy welcomes comments on this report by third parties.

EXECUTIVE SUMMARY

This report deals with a review of the terms applicable in Alberta to conventional oil and gas and a comparison of these terms with certain Lower 48 US States. Furthermore this report proposed new conventional oil and gas terms.

Analysis of current terms

In order to carry out the analysis of the conventional oil and gas terms in Alberta, oil and gas wells were selected with very low productivity to very high productivity. It was assumed that the high productivity wells would be deeper more expensive wells in terms of total expenditures. However, the expenditures per Mcf and per barrel would be considerably less for the high productivity wells. Seven levels of costs were used.

Gas was evaluated over the range of Henry Hub prices of US \$ 3 to US \$ 11 per Mcf. Oil was evaluated over the range of a WTI price of US \$ 20 to US \$ 100.

The Alberta terms for New Gas, Old Gas, Third Tier Oil, New Oil and Old Oil were evaluated and compared with the terms on private lands in Texas, New Mexico, Colorado, Wyoming and California.

It is concluded that the select prices and related scales both for gas and for oil are now based on price levels that are outdated. The select prices are simply too low to be effective. As a result, the fiscal systems of Alberta for oil and for gas have now become strongly price regressive for the above range of prices. The fiscal systems for gas and for oil remain strongly progressive with well productivity.

Under current economic conditions, the differences between New Gas and Old Gas are minor and as a result it can be recommended to merge these systems into a single system applicable to gas. The same applies to Third Tier Oil, New Oil and Old Oil and therefore it can also be recommended to merge these systems into one.

The fiscal systems of the five US States are generally much tougher for investors than those for Alberta with respect to low productivity and average productivity wells. The terms are similar to Alberta high productivity wells. The much better terms for investors in Alberta result in the drilling of the large number of marginal gas and oil wells in the province compared to more modest drilling in the US.

The competitiveness analysis with the US States indicated that there is considerable competitive scope for improving Alberta terms under higher prices. There is modest scope for improving government take on high productivity oil and gas wells.

In general, it can be recommended to lower royalties under low price levels and low well productivities wells, because the current formula's no longer protect very low productivity wells under low prices effectively.

Proposed new terms

The current system of Alberta conventional oil and gas terms is based on formula's which determine royalties on a joint price-volume relationship for oil and gas. Such formula's become rapidly outdated when price and cost conditions change.

As a result, the Alberta gas and oil royalties resulted in various vintages and many adjustments through a variety of royalty programs.

It creates more flexibility and durability if the price and volume have an independent impact on the royalty rate and vary over a wider range. It is therefore proposed to make the total royalty rate is simply the sum of the royalty rate based on price and the royalty rate based on volume of well production per day. In other words:

$$R\% = R_p\% + R_v\%$$

in which:

$R\%$ is the total royalty rate

$R_p\%$ is the royalty rate based on price per production unit

$R_v\%$ is the royalty rate based on volume of production per day per well

The same overall concept would apply to gas and oil.

It is possible to use relatively simple linear set of functions in order to define $R_p\%$ and the $R_v\%$.

Gas royalty

With respect to the royalty component based on the gas price, the royalty would be set at 0% at a price of Can \$ 5 per GJ. Over this price level the royalty would increase based on a linear function in such a manner that for every Can \$ 1 per GJ the royalty increases by 3%. At Can \$ 12 per GJ the royalty rate would reach 21%. For higher prices the royalty would increase only 1% for every Can \$ per GJ up to a maximum royalty rate of 30%. The royalty would stay flat at this rate under higher prices.

With respect to royalty component based on the gas volume of production per day per well, the royalty would be set at 0% at a price of 3 thousand m3 per day. Over this volume the royalty would increase by 3% for every thousand m3 per day. Once a production of 11 thousand m3 per day is reached the royalty would be 24%. Over this level, the royalty would continue to increase with 1% for every thousand m3 per day, until a maximum rate of 33% is reached.

The total gas royalty based on price and based on volume cannot exceed 45%.

The reason that the increase in royalty rates needs to slow down over certain levels relates to the marginal royalty rate. If the royalty rates increase on a linear basis, the combined incremental effect becomes rather strong. This could lead to marginal royalty rates that are so high that they would lead to a-commercial behavior.

Negative royalties, below the base rate will be calculated for either price or volume. Such negative royalties can be offset from the other royalty component. If both the royalties for price and volume are negative, the royalty will be set at 0%, of course.

Oil Royalty

The proposed oil royalty works in exactly the same way as the gas royalty. The base price for oil is Can \$ 300 per m3. Over this base price the oil royalty increases with a linear function that results in 0.05% increase in royalties per Can \$ per m3 increase in price. At Can \$ 700 per m3, the increase becomes 0.02% until a maximum rate of 30% is reached.

The base volume is 3 m3 per day. There is a 3% increase per m3 per day on a linear basis. At 11 m3 per day the increase becomes 1% up to a maximum rate of 33%.

The total oil royalty based on price and based on volume cannot exceed 45%.

Negative royalties are also applied for oil, below the base rate for either price or volume. If both the royalties are negative, the royalty will be set at 0%, of course.

Replacement of current royalty system

The gas royalty to be proposed is designed to replace the New Gas and Old Gas terms. The idea is to simplify the gas royalty system.

The oil royalty to be proposed is designed to replace the Third Tier, New Oil and Old Oil terms.

It cannot be recommended to create another “tier” and grandfather the current terms. The current terms are clearly outdated and no longer in the interest of Alberta.

Analysis of proposed terms

The Proposed Gas and Proposed Oil terms create systems that are clearly progressive with price and with the volume of well production.

Compared to the current terms the Proposed systems result in royalties that are much less compared to the current weighted average terms for marginal wells under low prices, but result in much higher royalties for prolific wells under high prices.

The Proposed terms are clearly competitive with US States, such as Texas, on average. However, the structure of the government take in Alberta is radically different. Texas is regressive with price and well productivity. The Proposed terms are progressive with price and well productivity.

The Proposed Gas terms provide for a higher level of profitability for marginal wells for the price range of US \$ 5 to US \$ 6 Henry Hub per GJ. This means that the terms will lead to a greater intensity of gas development. Also the exploration economics is more attractive under these conditions. This means that exploration for marginal gas pools will be pursued more aggressively under the new terms.

The Proposed Oil terms result in a level of profitability for marginal wells and low prices that is similar to Third Tier Oil. For better conditions the profitability resembles more Old Oil terms. Exploration for marginal oil pools will remain attractive.

Despite the strongly progressive nature with price and well productivity, the overall system will lead to a rational commercial behavior by investors, since the marginal royalty rates are targeted to be never much over 50%, while at the same time, the profitability reasonably improves with better wells.

Coal bed methane

Important coal bed methane deposits are contained in the Horseshoe Canyon and the Mannville formations.

For the Horseshoe Canyon formation, the proposed gas royalties will significantly improve the economics of marginal dry coal bed methane wells.

In the Mannville formation coal bed methane gas needs to be produced by removing large volumes of saline water. The royalty reduction under the Proposed Gas terms is very material compared to the water handling costs for Mannville type coal bed methane wells.

An initial impression is therefore that Mannville type coal bed methane wells with a reasonable water-gas ratio may become attractive under the Proposed Gas terms.

However, some more fiscal work on this matter can be recommended in order to see whether the current limited oil industry activity in Mannville type coal bed methane could be accelerated through stronger incentives.

Heavy oils

In general the Proposed Oil terms seem to fit very well with the economics of the conventional heavy oil wells. It does not seem that a separate system is necessary. Therefore, it can be recommended to merge the New Heavy Oil terms with the Proposed Oil system.

The Proposed terms will strongly encourage conventional heavy oil drilling compared to the current New Heavy terms. This is important, since much of the conventional oil is heavy.

Primary Oil Sand Oil

The average well productivity of Primary Oil Sands Oil wells is about 30 barrels per day. Given these statistics, it can be recommended to convert the Primary Oil Sands Oil projects to the Proposed system for conventional oil. This would greatly reduce administrative complexity and would at the same time provide an encouragement to enhance recovery.

Royalty Programs

With the significant improvements for marginal wells included under the Proposed terms, it is now possible to terminate various royalty programs.

It can be suggested to terminate for conventional oil, the “horizontal re-entry” program, the “re-activation of wells” program, the “low productivity wells” program and the “3rd Tier Exploratory” program.

The Proposed Gas terms do provide for a considerable improvement in terms for low productivity wells. As a result the drilling of deep wells will result in less risk. In case low productivity wells are being discovered, the lower royalties will make the well as attractive as possible.

Under the Proposed Gas terms, wells with high productivity result in higher royalties. Deep wells require often high productivity in order to be economic. As a result, the Proposed Gas terms may not deal effectively with deep gas wells. This is a matter than needs further investigation.

Summary

As a result of the recommendations in this report the Alberta royalty system could be significantly simplified. There would only be three royalty systems, for:

- Conventional gas
- Conventional oil, and
- Oil Sands

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MAIN REPORT

1. INTRODUCTION

1.1. Preliminary Comments

This report is provided at the request of the Department of Energy of the province of Alberta. The work is done under a consulting contract with Alberta.

The report contains an evaluation of the fiscal terms applicable to conventional oil and gas in Alberta and a comparison with the terms of certain Lower 48 US States. The purpose of the report is to serve as back ground to an evaluation of fiscal alternatives for the Royalty Review Panel.

The economic analysis is based on information provided by the Department of Energy and from sources available to the consultant. The cost and revenue data for Alberta are similar to the ones published in Technical Royalty Report OG # 2 of the Department of Energy entitled "*Alberta's Conventional Oil and Gas Industry – Investor Economics and Fiscal System Comparison*". However, the author adjusted these costs to seven different cost levels for a dry gas well and an oil well without associated gas.

In view of the wide range of possible cost and price scenarios, the "fiscal map" methodology will be used. This approach was also followed by the Department to produce cost-price "maps" of the various results.

The "maps" are contained in an electronic data base provided to the Department. In this report certain tables were "picked" from this data base in order to illustrate the various fiscal issues. Table numbers in this report are therefore not sequential.

2. ECONOMIC FRAME WORK AND WELL SELECTION

2.1. Economic framework and well selection.

The economic framework is based on two wells: a dry gas well and an oil well without associated gas.

In practice, many gas wells in Alberta would have some liquids associated with it. Also many oil wells have some associated gas. However, the terms for gas and for oil in Alberta are rather different and therefore it is important to analyze these terms on the basis of a “pure” gas well and a “pure” oil well.

2.2. Costs and prices

In the case of wells the total expenditures per barrel or per Mcf are strongly influenced by the well productivity. Therefore wells were selected ranging from very low productivity wells to very high productivity wells. It was assumed that the high productivity wells would have to be drilled deeper than the low productivity wells and therefore in terms of total expenditures these wells are more costly.

Following two tables provide the summary of the data used for the dry gas well and the oil well.

Table 2.1. Gas well data

		CL-7	CL-6	CL-5	CL-4	CL-3	CL-2	CL-1
First year production	(Mcf/day)	137	274	411	685	1370	2740	5479
Years in production	(years)	8	10	11	12	14	16	18
Geophysical Expenditures	(Thousand 2007 Can \$)	20	40	40	50	60	70	80
Well Capex	(Thousand 2007 Can \$)	260	500	700	1050	1800	3000	4500
Abandonment Expenditures	(Thousand 2007 Can \$)	30	40	40	50	60	70	80
Operating Costs	(2007 Can \$/Mcf)	1.75	1.62	1.50	1.37	1.25	1.12	1.00
Total Expenditures/Mcf	(2007 Can \$/Mcf)	3.58	3.31	3.02	2.72	2.38	2.05	1.69

Table 2.2. Oil well data

		CL-7	CL-6	CL-5	CL-4	CL-3	CL-2	CL-1
First year production	(bbls/day)	8	14	27	55	110	219	438
Years in production	(years)	6	6	8	10	12	14	16
Geophysical Expenditures	(Thousand 2007 Can \$)	10	20	30	40	50	60	70
Well Capex	(Thousand 2007 Can \$)	150	220	400	700	1200	1950	3500
Abandonment Expenditures	(Thousand 2007 Can \$)	10	20	30	40	50	60	70
Operating Costs	(2007 Can \$/bbl)	14.00	13.00	12.00	11.00	10.00	9.00	8.00
Total Expenditures/bbl	(2007 Can \$/bbl)	34.43	30.68	26.64	23.04	19.89	16.82	14.85

It was assumed that all wells would decline by 30% per year from the level of the first year production.

The gas well maps were based on Henry Hub prices ranging from US \$ 3.00 to US \$ 11.00. It was assumed that the differential between the Alberta gas well head price and the US Henry Hub price would be Can \$ 1.20 per Mcf.

The oil well maps were based on WTI prices ranging from US \$ 20 to US \$ 100. It was assumed that the differential between the Alberta oil well head price and WTI would be Can \$ 1.50 per barrel.

An exchange rate of 0.88 US \$ per Can \$ was used.

All expenditures are provided in 2007 Canadian real dollars.

In order to determine corporate income tax and other fiscal features it was assumed that all prices and all expenditures would escalate by 2%. In order to calculate real dollar results the cash flows were subsequently discounted by 2% for inflation.

2.3. Economic and fiscal parameters.

The profitability and attractiveness indicators and the related color coding are the same as used for the reports of the author on oil sands terms. Investors may use different criteria for oil and gas wells and for oil sands. However, in order to show the differences in economic characteristics between oil and gas wells and oil sands the color coding has been kept the same.

Profitability indicators

The same profitability indicators will be used as in earlier reports. For this analysis the following indicators were selected:

- Internal Rate of Return (IRR)
- Profitability Ratio discounted at 10% (PFR @10% or PFR10)
- Net Present Value @ 10% per barrel equivalent (NPV10/BOE)

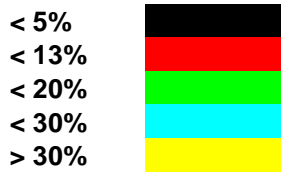
The tables will be color coded in the same manner as in the previous report as follows:

Black	- the project has an IRR of less than 5% in real terms.
Red	- the project is typically unacceptable to the investor
Green	- the project is typically acceptable to the investor
Blue	- the project is attractive to the investor
Yellow (“Gold”)	- the project is very attractive to the investor

It should be noted that “acceptable” or “attractive” are used here in an overall context relative to any other investment opportunity.

For instance, the following assessment was made for the IRR

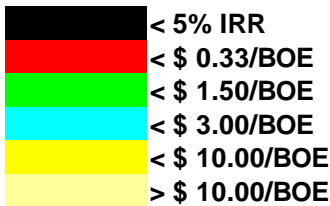
IRR assessment



IRR < 5%	- black	
IRR < 13%	- red	- unacceptable
IRR < 20%	- green	- acceptable
IRR < 30%	- blue	- attractive
IRR of 30% and higher	- gold	- very attractive

For NPV10/BOE a further color was added since these values are typically much higher than for oil sand developments. Over \$ 10 per BOE a pale yellow color was added as follows:

NPV10/BOE assessment



Attractiveness Indicators.

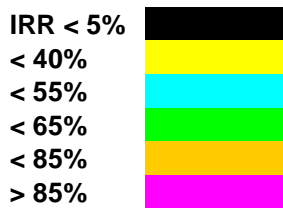
For this comparison between Alberta and the Lower 48 US States, three attractiveness indicators will be used that were also used in the earlier reports:

- Undiscounted government take
- Discounted government take @ 5%
- Government revenues (income + participation) per barrel.

General comment

The color coding of the maps will be done from an investor perspective. In general, the concept will be used that “gold” represents a low government take from an international perspective, “green” an average government take from an international perspective and “magenta” a high government take from an international perspective. For instance, the following assessment was made for the government take:

Gov Take assessment



IRR	< 5%	- black	
Government Take	< 40%	- gold	- very low
Government Take	< 55%	- blue	- low
Government Take	< 65%	- green	- average
Government Take	< 85%	- brown	- high
Government Take	over 85%	- magenta	- very high

3. FISCAL TERMS AND INTERNATIONAL COMPARISON

A comparative analysis was done between Alberta and five Lower 48 US States. Following are the fiscal terms that were used.

3.1. Alberta fiscal terms

The fiscal terms for conventional oil and gas in Alberta were obtained from the publication “Oil and Gas Fiscal Regimes – Western Canadian Provinces and Territories” (December 2006) published by the Department of Energy. This publication is available on www.energy.gov.ab.ca.

The only adjustment was for the slight increase in select prices as applicable to 2007.

A combined Canadian tax rate of 30% was used.

For gas the Alberta New Gas and Old Gas fiscal systems were included.

For oil the Alberta Old Oil, New Oil and Third Tier Oil fiscal systems were included.

3.2. US fiscal terms

Five different US States were used for comparison:

- Texas
- New Mexico
- Colorado
- Wyoming, and
- California

The fiscal terms that were used were those contained in Technical Royalty Report OG # 2. The basis for these terms was reviewed by the author and found to be accurate. The fiscal terms reflect the terms on private lands in these states. This is reasonable since most of the non-Federal acreage in these states is held privately.

For purposes of US corporate income tax it was assumed that 80% of the well capital expenditures would be intangible.

Given the employment incentives a US Federal Tax Rate of 34% was used.

For purposes of the net back to the well heads the following differentials were used.

Table 3.1. Gas price differentials relative to Henry Hub

	(2007 Can \$/Mcf)
Alberta	1.20
Texas	0.20
New Mexico	0.85
Colorado	0.70
Wyoming	1.15
California	0.50

Table 3.2. Oil price differentials relative to WTI

	(2007 Can \$/bbl)
Alberta	1.50
Texas	0.20
New Mexico	0.85
Colorado	0.70
Wyoming	1.25
California	0.50

4. FISCAL AND ECONOMIC REVIEW

4.1. Analysis of the dry gas well

Following is a step by step comparison between Alberta and the five US states.

Gross Revenues per Mcf

Following seven tables provide the Gross Revenues per Mcf.

Table 4.001 ALBERTA-NEW GAS WELL
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$3.35	\$3.35
5	\$4.48	\$4.48	\$4.48	\$4.48	\$4.48	\$4.48	\$4.48
6	\$5.62	\$5.62	\$5.62	\$5.62	\$5.62	\$5.62	\$5.62
7	\$6.75	\$6.75	\$6.75	\$6.75	\$6.75	\$6.75	\$6.75
8	\$7.89	\$7.89	\$7.89	\$7.89	\$7.89	\$7.89	\$7.89
9	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03
10	\$10.16	\$10.16	\$10.16	\$10.16	\$10.16	\$10.16	\$10.16
11	\$11.30	\$11.30	\$11.30	\$11.30	\$11.30	\$11.30	\$11.30

Table 4.011 ALBERTA-OLD GAS WELL
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$3.35	\$3.35
5	\$4.48	\$4.48	\$4.48	\$4.48	\$4.48	\$4.48	\$4.48
6	\$5.62	\$5.62	\$5.62	\$5.62	\$5.62	\$5.62	\$5.62
7	\$6.75	\$6.75	\$6.75	\$6.75	\$6.75	\$6.75	\$6.75
8	\$7.89	\$7.89	\$7.89	\$7.89	\$7.89	\$7.89	\$7.89
9	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03	\$9.03
10	\$10.16	\$10.16	\$10.16	\$10.16	\$10.16	\$10.16	\$10.16
11	\$11.30	\$11.30	\$11.30	\$11.30	\$11.30	\$11.30	\$11.30

Table 4.021 TEXAS GAS WELL
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$3.21
4					\$4.35	\$4.35	\$4.35
5		\$5.48	\$5.48	\$5.48	\$5.48	\$5.48	\$5.48
6	\$6.62	\$6.62	\$6.62	\$6.62	\$6.62	\$6.62	\$6.62
7	\$7.75	\$7.75	\$7.75	\$7.75	\$7.75	\$7.75	\$7.75
8	\$8.89	\$8.89	\$8.89	\$8.89	\$8.89	\$8.89	\$8.89
9	\$10.03	\$10.03	\$10.03	\$10.03	\$10.03	\$10.03	\$10.03
10	\$11.16	\$11.16	\$11.16	\$11.16	\$11.16	\$11.16	\$11.16
11	\$12.30	\$12.30	\$12.30	\$12.30	\$12.30	\$12.30	\$12.30

Table 4.031 NEW MEXICO GAS WELL
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					\$3.70	\$3.70	\$3.70
5				\$4.83	\$4.83	\$4.83	\$4.83
6	\$5.97	\$5.97	\$5.97	\$5.97	\$5.97	\$5.97	\$5.97
7	\$7.10	\$7.10	\$7.10	\$7.10	\$7.10	\$7.10	\$7.10
8	\$8.24	\$8.24	\$8.24	\$8.24	\$8.24	\$8.24	\$8.24
9	\$9.38	\$9.38	\$9.38	\$9.38	\$9.38	\$9.38	\$9.38
10	\$10.51	\$10.51	\$10.51	\$10.51	\$10.51	\$10.51	\$10.51
11	\$11.65	\$11.65	\$11.65	\$11.65	\$11.65	\$11.65	\$11.65

Table 4.041 COLORADO GAS WELL
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$2.71
4					\$3.85	\$3.85	\$3.85
5		\$4.98	\$4.98	\$4.98	\$4.98	\$4.98	\$4.98
6	\$6.12	\$6.12	\$6.12	\$6.12	\$6.12	\$6.12	\$6.12
7	\$7.25	\$7.25	\$7.25	\$7.25	\$7.25	\$7.25	\$7.25
8	\$8.39	\$8.39	\$8.39	\$8.39	\$8.39	\$8.39	\$8.39
9	\$9.53	\$9.53	\$9.53	\$9.53	\$9.53	\$9.53	\$9.53
10	\$10.66	\$10.66	\$10.66	\$10.66	\$10.66	\$10.66	\$10.66
11	\$11.80	\$11.80	\$11.80	\$11.80	\$11.80	\$11.80	\$11.80

Table 4.051 WYOMING GAS WELL
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$3.40	\$3.40
5				\$4.53	\$4.53	\$4.53	\$4.53
6	\$5.67	\$5.67	\$5.67	\$5.67	\$5.67	\$5.67	\$5.67
7	\$6.80	\$6.80	\$6.80	\$6.80	\$6.80	\$6.80	\$6.80
8	\$7.94	\$7.94	\$7.94	\$7.94	\$7.94	\$7.94	\$7.94
9	\$9.08	\$9.08	\$9.08	\$9.08	\$9.08	\$9.08	\$9.08
10	\$10.21	\$10.21	\$10.21	\$10.21	\$10.21	\$10.21	\$10.21
11	\$11.35	\$11.35	\$11.35	\$11.35	\$11.35	\$11.35	\$11.35

Table 4.061 CALIFORNIA GAS WELL
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$2.91
4				\$4.05	\$4.05	\$4.05	\$4.05
5	\$5.18	\$5.18	\$5.18	\$5.18	\$5.18	\$5.18	\$5.18
6	\$6.32	\$6.32	\$6.32	\$6.32	\$6.32	\$6.32	\$6.32
7	\$7.45	\$7.45	\$7.45	\$7.45	\$7.45	\$7.45	\$7.45
8	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59	\$8.59
9	\$9.73	\$9.73	\$9.73	\$9.73	\$9.73	\$9.73	\$9.73
10	\$10.86	\$10.86	\$10.86	\$10.86	\$10.86	\$10.86	\$10.86
11	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00

The gross revenues per Mcf do indicate that Texas has higher values than the other jurisdictions. It also indicates that Alberta has the lowest values.

Total Expenditures per Mcf

The same well costs were used for all of the cases. Therefore, the following table only shows the Alberta case.

Table 4.002 **ALBERTA-NEW** **GAS WELL**
Total expenditures (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$2.05	\$1.69
5	\$3.58	\$3.31	\$3.02	\$2.72	\$2.38	\$2.05	\$1.69
6	\$3.58	\$3.31	\$3.02	\$2.72	\$2.38	\$2.05	\$1.69
7	\$3.58	\$3.31	\$3.02	\$2.72	\$2.38	\$2.05	\$1.69
8	\$3.58	\$3.31	\$3.02	\$2.72	\$2.38	\$2.05	\$1.69
9	\$3.72	\$3.31	\$3.02	\$2.72	\$2.38	\$2.05	\$1.69
10	\$3.72	\$3.31	\$3.02	\$2.72	\$2.38	\$2.05	\$1.69
11	\$3.72	\$3.41	\$3.09	\$2.77	\$2.38	\$2.05	\$1.69

The cost range is as described in Chapter 2 of this report.

Divisible Income per Mcf

Following seven tables provide the divisible income per Mcf.

Table 4.003 **ALBERTA-NEW** **GAS WELL**
Divisible Income (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$1.30	\$1.66
5	\$0.90	\$1.17	\$1.46	\$1.77	\$2.10	\$2.44	\$2.79
6	\$2.04	\$2.31	\$2.60	\$2.90	\$3.24	\$3.57	\$3.93
7	\$3.17	\$3.45	\$3.73	\$4.04	\$4.38	\$4.71	\$5.07
8	\$4.31	\$4.58	\$4.87	\$5.17	\$5.51	\$5.85	\$6.20
9	\$5.30	\$5.72	\$6.00	\$6.31	\$6.65	\$6.98	\$7.34
10	\$6.44	\$6.86	\$7.14	\$7.45	\$7.79	\$8.12	\$8.48
11	\$7.58	\$7.89	\$8.21	\$8.53	\$8.92	\$9.25	\$9.61

Table 4.013 ALBERTA-OLD GAS WELL
Divisible Income (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$1.30	\$1.66
5	\$0.90	\$1.17	\$1.46	\$1.77	\$2.10	\$2.44	\$2.79
6	\$2.04	\$2.31	\$2.60	\$2.90	\$3.24	\$3.57	\$3.93
7	\$3.17	\$3.45	\$3.73	\$4.04	\$4.38	\$4.71	\$5.07
8	\$4.31	\$4.58	\$4.87	\$5.17	\$5.51	\$5.85	\$6.20
9	\$5.30	\$5.72	\$6.00	\$6.31	\$6.65	\$6.98	\$7.34
10	\$6.44	\$6.86	\$7.14	\$7.45	\$7.79	\$8.12	\$8.48
11	\$7.58	\$7.89	\$8.21	\$8.53	\$8.92	\$9.25	\$9.61

Table 4.023 TEXAS GAS WELL
Divisible Income (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$1.52
4					\$1.97	\$2.30	\$2.66
5		\$2.17	\$2.46	\$2.77	\$3.10	\$3.44	\$3.79
6	\$3.04	\$3.31	\$3.60	\$3.90	\$4.24	\$4.57	\$4.93
7	\$4.17	\$4.45	\$4.73	\$5.04	\$5.38	\$5.71	\$6.07
8	\$5.31	\$5.58	\$5.87	\$6.17	\$6.51	\$6.85	\$7.20
9	\$6.30	\$6.72	\$7.00	\$7.31	\$7.65	\$7.98	\$8.34
10	\$7.44	\$7.86	\$8.14	\$8.45	\$8.79	\$9.12	\$9.48
11	\$8.58	\$8.89	\$9.21	\$9.53	\$9.92	\$10.25	\$10.61

Table 4.033 NEW MEXICO GAS WELL
Divisible Income (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					\$1.32	\$1.65	\$2.01
5				\$2.12	\$2.45	\$2.79	\$3.14
6	\$2.39	\$2.66	\$2.95	\$3.25	\$3.59	\$3.92	\$4.28
7	\$3.52	\$3.80	\$4.08	\$4.39	\$4.73	\$5.06	\$5.42
8	\$4.66	\$4.93	\$5.22	\$5.52	\$5.86	\$6.20	\$6.55
9	\$5.65	\$6.07	\$6.35	\$6.66	\$7.00	\$7.33	\$7.69
10	\$6.79	\$7.21	\$7.49	\$7.80	\$8.14	\$8.47	\$8.83
11	\$7.93	\$8.24	\$8.56	\$8.88	\$9.27	\$9.60	\$9.96

Table 4.043 COLORADO GAS WELL
Divisible Income (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$1.02
4					\$1.47	\$1.80	\$2.16
5		\$1.67	\$1.96	\$2.27	\$2.60	\$2.94	\$3.29
6	\$2.54	\$2.81	\$3.10	\$3.40	\$3.74	\$4.07	\$4.43
7	\$3.67	\$3.95	\$4.23	\$4.54	\$4.88	\$5.21	\$5.57
8	\$4.81	\$5.08	\$5.37	\$5.67	\$6.01	\$6.35	\$6.70
9	\$5.80	\$6.22	\$6.50	\$6.81	\$7.15	\$7.48	\$7.84
10	\$6.94	\$7.36	\$7.64	\$7.95	\$8.29	\$8.62	\$8.98
11	\$8.08	\$8.39	\$8.71	\$9.03	\$9.42	\$9.75	\$10.11

Table 4.053 WYOMING GAS WELL
Divisible Income (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$1.35	\$1.71
5				\$1.82	\$2.15	\$2.49	\$2.84
6	\$2.09	\$2.36	\$2.65	\$2.95	\$3.29	\$3.62	\$3.98
7	\$3.22	\$3.50	\$3.78	\$4.09	\$4.43	\$4.76	\$5.12
8	\$4.36	\$4.63	\$4.92	\$5.22	\$5.56	\$5.90	\$6.25
9	\$5.35	\$5.77	\$6.05	\$6.36	\$6.70	\$7.03	\$7.39
10	\$6.49	\$6.91	\$7.19	\$7.50	\$7.84	\$8.17	\$8.53
11	\$7.63	\$7.94	\$8.26	\$8.58	\$8.97	\$9.30	\$9.66

Table 4.063 CALIFORNIA GAS WELL
Divisible Income (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$1.22
4				\$1.33	\$1.67	\$2.00	\$2.36
5	\$1.60	\$1.87	\$2.16	\$2.47	\$2.80	\$3.14	\$3.49
6	\$2.74	\$3.01	\$3.30	\$3.60	\$3.94	\$4.27	\$4.63
7	\$3.87	\$4.15	\$4.43	\$4.74	\$5.08	\$5.41	\$5.77
8	\$5.01	\$5.28	\$5.57	\$5.87	\$6.21	\$6.55	\$6.90
9	\$6.15	\$6.42	\$6.70	\$7.01	\$7.35	\$7.68	\$8.04
10	\$7.28	\$7.56	\$7.84	\$8.15	\$8.49	\$8.82	\$9.18
11	\$8.28	\$8.69	\$8.98	\$9.28	\$9.62	\$9.95	\$10.31

As can be expected, the divisible income is least attractive for Alberta and the most attractive in Texas.

This is very important under low price conditions. Due to the fact that Alberta has to transport gas over large distances to reach US and Eastern Canadian markets, the available divisible income under low prices is modest compared to Texas or some other US states.

Government Revenues per Mcf

Following seven tables provide the government revenues per Mcf. In the US States the revenues of private royalty owners is also taken into account in the total.

Table 4.004 ALBERTA-NEW GAS WELL
Government Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$1.05	\$1.17
5	\$0.64	\$0.88	\$1.08	\$1.30	\$1.49	\$1.63	\$1.76
6	\$1.08	\$1.35	\$1.58	\$1.83	\$2.04	\$2.20	\$2.33
7	\$1.51	\$1.82	\$2.08	\$2.36	\$2.60	\$2.77	\$2.91
8	\$1.94	\$2.29	\$2.59	\$2.90	\$3.16	\$3.34	\$3.48
9	\$2.38	\$2.77	\$3.09	\$3.43	\$3.72	\$3.90	\$4.06
10	\$2.76	\$3.24	\$3.59	\$3.96	\$4.27	\$4.47	\$4.63
11	\$3.19	\$3.71	\$4.09	\$4.50	\$4.83	\$5.04	\$5.20

Table 4.014 ALBERTA-OLD GAS WELL
Government Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$1.17	\$1.30
5	\$0.68	\$0.95	\$1.17	\$1.42	\$1.63	\$1.78	\$1.91
6	\$1.13	\$1.44	\$1.70	\$1.98	\$2.22	\$2.38	\$2.52
7	\$1.57	\$1.93	\$2.23	\$2.55	\$2.81	\$2.99	\$3.14
8	\$2.02	\$2.42	\$2.75	\$3.11	\$3.40	\$3.60	\$3.75
9	\$2.46	\$2.91	\$3.28	\$3.67	\$4.00	\$4.20	\$4.36
10	\$2.85	\$3.40	\$3.81	\$4.24	\$4.59	\$4.81	\$4.97
11	\$3.29	\$3.89	\$4.33	\$4.80	\$5.18	\$5.41	\$5.59

Table 4.024 TEXAS GAS WELL
Government & Private Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$1.25
4					\$1.66	\$1.77	\$1.87
5		\$1.97	\$2.07	\$2.17	\$2.28	\$2.39	\$2.50
6	\$2.48	\$2.59	\$2.69	\$2.79	\$2.90	\$3.01	\$3.12
7	\$3.10	\$3.21	\$3.31	\$3.41	\$3.52	\$3.63	\$3.74
8	\$3.72	\$3.83	\$3.93	\$4.03	\$4.15	\$4.25	\$4.36
9	\$4.35	\$4.45	\$4.55	\$4.65	\$4.77	\$4.87	\$4.98
10	\$4.97	\$5.07	\$5.17	\$5.27	\$5.39	\$5.50	\$5.60
11	\$5.59	\$5.70	\$5.79	\$5.90	\$6.01	\$6.12	\$6.22

Table 4.034 NEW MEXICO GAS WELL
Government & Private Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					\$1.23	\$1.35	\$1.47
5				\$1.73	\$1.86	\$1.98	\$2.10
6	\$2.01	\$2.13	\$2.24	\$2.36	\$2.49	\$2.61	\$2.73
7	\$2.64	\$2.76	\$2.87	\$2.99	\$3.12	\$3.24	\$3.36
8	\$3.27	\$3.39	\$3.50	\$3.62	\$3.75	\$3.87	\$3.99
9	\$3.90	\$4.02	\$4.13	\$4.25	\$4.38	\$4.50	\$4.62
10	\$4.53	\$4.65	\$4.76	\$4.88	\$5.01	\$5.13	\$5.25
11	\$5.16	\$5.28	\$5.39	\$5.51	\$5.64	\$5.76	\$5.88

Table 4.044 COLORADO GAS WELL
Government & Private Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.88
4					\$1.30	\$1.39	\$1.49
5		\$1.57	\$1.68	\$1.78	\$1.89	\$2.00	\$2.08
6	\$2.00	\$2.13	\$2.24	\$2.34	\$2.47	\$2.58	\$2.68
7	\$2.56	\$2.70	\$2.81	\$2.92	\$3.04	\$3.16	\$3.26
8	\$3.14	\$3.27	\$3.38	\$3.49	\$3.62	\$3.74	\$3.85
9	\$3.71	\$3.85	\$3.96	\$4.07	\$4.20	\$4.32	\$4.43
10	\$4.29	\$4.43	\$4.54	\$4.66	\$4.79	\$4.91	\$5.02
11	\$4.88	\$5.01	\$5.13	\$5.24	\$5.37	\$5.49	\$5.61

Table 4.054 WYOMING GAS WELL
Government & Private Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$1.24	\$1.34
5				\$1.69	\$1.80	\$1.86	\$1.93
6	\$1.95	\$2.08	\$2.17	\$2.26	\$2.37	\$2.46	\$2.52
7	\$2.52	\$2.65	\$2.74	\$2.84	\$2.94	\$3.03	\$3.10
8	\$3.09	\$3.22	\$3.32	\$3.41	\$3.51	\$3.60	\$3.67
9	\$3.66	\$3.79	\$3.89	\$3.98	\$4.09	\$4.18	\$4.25
10	\$4.24	\$4.36	\$4.46	\$4.55	\$4.66	\$4.75	\$4.82
11	\$4.81	\$4.94	\$5.03	\$5.13	\$5.23	\$5.32	\$5.39

Table 4.064 CALIFORNIA GAS WELL
Government & Private Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.95
4				\$1.16	\$1.29	\$1.42	\$1.56
5	\$1.42	\$1.53	\$1.65	\$1.77	\$1.90	\$2.03	\$2.16
6	\$2.03	\$2.14	\$2.25	\$2.37	\$2.51	\$2.63	\$2.77
7	\$2.63	\$2.75	\$2.86	\$2.98	\$3.11	\$3.24	\$3.37
8	\$3.24	\$3.35	\$3.47	\$3.59	\$3.72	\$3.85	\$3.98
9	\$3.85	\$3.96	\$4.07	\$4.19	\$4.33	\$4.45	\$4.59
10	\$4.45	\$4.57	\$4.68	\$4.80	\$4.93	\$5.06	\$5.19
11	\$5.00	\$5.17	\$5.29	\$5.40	\$5.54	\$5.67	\$5.80

It is obvious from the two Alberta tables that the government revenues per Mcf from Old Gas and New Gas are not very different for the price range considered in this report. The reason is that at the time these concepts were established, the gas prices were rather low in Alberta and therefore the differences in select prices were important at the time. Today the actual gas prices are far over the select prices for either Old Gas or New Gas and therefore there is no longer an important difference between the fiscal systems.

The government revenues per Mcf in Alberta for Old Gas and New Gas are significantly lower than those in the Lower 48 US States for most price-cost combinations.

The difference is, in particular, remarkable for the high cost low productivity wells. It should be noted that with respect to private royalty owners it is likely that in some cases, such owners would agree to lower royalties.

However, a large share of the government take in most states is related to a higher corporate income tax, severance taxes and property taxes. Severance taxes do not occur on Alberta leases. Also property taxes in the US are typically very high. For all these reasons, even if private royalty owners would agree to lower royalties on marginal wells, the difference in between Alberta and the US states would still be remarkable.

Net Cash per Mcf

Following seven tables provide the net cash per Mcf.

Table 4.005 ALBERTA-NEW GAS WELL
Net Cash (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$0.25	\$0.48
5	\$0.26	\$0.30	\$0.38	\$0.47	\$0.62	\$0.81	\$1.03
6	\$0.96	\$0.96	\$1.01	\$1.07	\$1.20	\$1.37	\$1.60
7	\$1.66	\$1.62	\$1.65	\$1.67	\$1.78	\$1.94	\$2.16
8	\$2.37	\$2.29	\$2.28	\$2.28	\$2.36	\$2.51	\$2.72
9	\$2.93	\$2.95	\$2.92	\$2.88	\$2.94	\$3.08	\$3.28
10	\$3.68	\$3.62	\$3.55	\$3.48	\$3.51	\$3.65	\$3.85
11	\$4.39	\$4.18	\$4.12	\$4.03	\$4.09	\$4.21	\$4.41

Table 4.015 ALBERTA-OLD GAS WELL
Net Cash (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$0.13	\$0.36
5	\$0.22	\$0.22	\$0.28	\$0.35	\$0.48	\$0.66	\$0.88
6	\$0.91	\$0.87	\$0.89	\$0.92	\$1.02	\$1.19	\$1.40
7	\$1.60	\$1.51	\$1.50	\$1.49	\$1.57	\$1.72	\$1.93
8	\$2.29	\$2.16	\$2.11	\$2.06	\$2.11	\$2.25	\$2.45
9	\$2.84	\$2.81	\$2.72	\$2.64	\$2.66	\$2.78	\$2.98
10	\$3.59	\$3.45	\$3.33	\$3.21	\$3.20	\$3.31	\$3.50
11	\$4.28	\$3.99	\$3.88	\$3.73	\$3.74	\$3.84	\$4.02

Table 4.025 TEXAS GAS WELL
Net Cash (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.27
4					\$0.31	\$0.53	\$0.78
5		\$0.21	\$0.39	\$0.60	\$0.82	\$1.05	\$1.30
6	\$0.56	\$0.72	\$0.91	\$1.11	\$1.34	\$1.56	\$1.81
7	\$1.07	\$1.24	\$1.42	\$1.63	\$1.85	\$2.08	\$2.33
8	\$1.59	\$1.75	\$1.94	\$2.14	\$2.37	\$2.59	\$2.84
9	\$1.96	\$2.27	\$2.45	\$2.66	\$2.88	\$3.11	\$3.36
10	\$2.47	\$2.78	\$2.97	\$3.17	\$3.40	\$3.62	\$3.87
11	\$2.99	\$3.19	\$3.41	\$3.63	\$3.91	\$4.14	\$4.39

Table 4.035 NEW MEXICO GAS WELL
Net Cash (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					\$0.09	\$0.30	\$0.54
5				\$0.39	\$0.60	\$0.81	\$1.04
6	\$0.37	\$0.53	\$0.70	\$0.89	\$1.10	\$1.31	\$1.55
7	\$0.88	\$1.03	\$1.21	\$1.40	\$1.61	\$1.82	\$2.05
8	\$1.39	\$1.54	\$1.71	\$1.91	\$2.12	\$2.33	\$2.56
9	\$1.75	\$2.05	\$2.22	\$2.41	\$2.62	\$2.83	\$3.07
10	\$2.26	\$2.55	\$2.73	\$2.92	\$3.13	\$3.34	\$3.57
11	\$2.76	\$2.96	\$3.16	\$3.37	\$3.64	\$3.85	\$4.08

Table 4.045 COLORADO GAS WELL
Net Cash (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.14
4					\$0.17	\$0.41	\$0.67
5		\$0.10	\$0.28	\$0.49	\$0.71	\$0.94	\$1.21
6	\$0.54	\$0.68	\$0.86	\$1.06	\$1.28	\$1.50	\$1.75
7	\$1.11	\$1.25	\$1.42	\$1.62	\$1.84	\$2.05	\$2.30
8	\$1.67	\$1.81	\$1.98	\$2.18	\$2.39	\$2.61	\$2.86
9	\$2.09	\$2.37	\$2.54	\$2.74	\$2.95	\$3.16	\$3.41
10	\$2.65	\$2.93	\$3.10	\$3.29	\$3.50	\$3.71	\$3.95
11	\$3.20	\$3.38	\$3.58	\$3.79	\$4.05	\$4.26	\$4.50

Table 4.055 WYOMING GAS WELL
Net Cash (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$0.11	\$0.37
5				\$0.12	\$0.36	\$0.63	\$0.91
6	\$0.14	\$0.28	\$0.47	\$0.69	\$0.92	\$1.16	\$1.46
7	\$0.71	\$0.85	\$1.04	\$1.25	\$1.49	\$1.73	\$2.02
8	\$1.27	\$1.41	\$1.60	\$1.82	\$2.05	\$2.29	\$2.58
9	\$1.69	\$1.98	\$2.16	\$2.38	\$2.61	\$2.86	\$3.14
10	\$2.25	\$2.54	\$2.73	\$2.94	\$3.18	\$3.42	\$3.71
11	\$2.82	\$3.00	\$3.22	\$3.46	\$3.74	\$3.98	\$4.27

Table 4.065 CALIFORNIA GAS WELL
Net Cash (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.27
4				\$0.17	\$0.38	\$0.58	\$0.80
5	\$0.18	\$0.34	\$0.51	\$0.70	\$0.91	\$1.11	\$1.33
6	\$0.71	\$0.87	\$1.04	\$1.23	\$1.44	\$1.64	\$1.86
7	\$1.24	\$1.40	\$1.57	\$1.76	\$1.97	\$2.17	\$2.39
8	\$1.77	\$1.93	\$2.10	\$2.29	\$2.50	\$2.70	\$2.92
9	\$2.30	\$2.46	\$2.63	\$2.82	\$3.03	\$3.23	\$3.45
10	\$2.83	\$2.99	\$3.16	\$3.35	\$3.55	\$3.76	\$3.98
11	\$3.27	\$3.52	\$3.69	\$3.88	\$4.08	\$4.29	\$4.51

The Net Cash per Mcf retained in Alberta under the New Gas fiscal system is more than in the Lower 48 US States for Cost-7 through Cost-4. Also for high productivity wells the Net Cash per Mcf is sometimes more. However, compared to some states the low Alberta net back makes Alberta less attractive for some of the Cost-2 and Cost-1 wells.

Undiscounted Government Take

Following are the seven tables for the Undiscounted Government Take.

Table 4.006 ALBERTA-NEW GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						80.81%	70.80%
5	71.35%	74.76%	73.97%	73.40%	70.68%	66.95%	63.00%
6	52.83%	58.44%	60.92%	63.05%	63.08%	61.56%	59.38%
7	47.58%	52.88%	55.82%	58.53%	59.43%	58.77%	57.39%
8	45.09%	50.08%	53.10%	55.99%	57.28%	57.07%	56.13%
9	43.65%	48.39%	51.42%	54.37%	55.86%	55.92%	55.26%
10	42.81%	47.26%	50.26%	53.24%	54.86%	55.09%	54.62%
11	42.10%	46.45%	49.43%	52.41%	54.12%	54.47%	54.13%

Table 4.016 ALBERTA-OLD GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						90.26%	78.43%
5	75.98%	80.93%	80.53%	80.24%	77.28%	73.02%	68.45%
6	55.40%	62.37%	65.55%	68.27%	68.45%	66.75%	64.25%
7	49.56%	56.04%	59.69%	63.03%	64.21%	63.51%	61.93%
8	46.80%	52.86%	56.57%	60.10%	61.72%	61.53%	60.46%
9	45.19%	50.94%	54.63%	58.22%	60.07%	60.19%	59.44%
10	44.25%	49.65%	53.30%	56.92%	58.91%	59.22%	58.70%
11	43.46%	48.74%	52.34%	55.96%	58.04%	58.50%	58.13%

Table 4.026 TEXAS GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							82.39%
4					84.37%	76.87%	70.54%
5		90.52%	84.04%	78.41%	73.50%	69.53%	65.78%
6	81.73%	78.21%	74.76%	71.49%	68.46%	65.84%	63.22%
7	74.36%	72.20%	69.94%	67.70%	65.54%	63.61%	61.62%
8	70.15%	68.63%	66.98%	65.30%	63.65%	62.13%	60.52%
9	67.42%	66.27%	64.98%	63.65%	62.31%	61.07%	59.73%
10	65.51%	64.59%	63.54%	62.44%	61.33%	60.27%	59.12%
11	64.10%	63.34%	62.46%	61.52%	60.56%	59.65%	58.64%

Table 4.036 NEW MEXICO GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					93.13%	81.79%	73.33%
5				81.74%	75.68%	71.04%	66.86%
6	84.38%	80.17%	76.19%	72.55%	69.28%	66.52%	63.83%
7	75.05%	72.77%	70.41%	68.12%	65.95%	64.03%	62.07%
8	70.27%	68.78%	67.15%	65.51%	63.91%	62.46%	60.92%
9	67.36%	66.28%	65.06%	63.79%	62.54%	61.37%	60.11%
10	65.41%	64.57%	63.60%	62.57%	61.55%	60.57%	59.51%
11	64.00%	63.33%	62.52%	61.67%	60.80%	59.97%	59.04%

Table 4.046 COLORADO GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							89.71%
4					90.08%	78.30%	69.35%
5		93.77%	85.54%	78.44%	72.67%	68.13%	63.28%
6	78.76%	75.92%	72.36%	68.88%	65.90%	63.27%	60.46%
7	69.76%	68.42%	66.40%	64.26%	62.37%	60.59%	58.59%
8	65.20%	64.40%	63.03%	61.57%	60.21%	58.92%	57.40%
9	62.45%	61.91%	60.92%	59.80%	58.80%	57.77%	56.56%
10	60.62%	60.22%	59.45%	58.59%	57.77%	56.96%	55.95%
11	59.35%	59.03%	58.40%	57.68%	57.02%	56.33%	55.48%

Table 4.056 WYOMING GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						95.51%	79.26%
5				93.17%	83.36%	75.20%	68.11%
6	93.22%	87.92%	82.13%	76.69%	71.97%	67.87%	63.31%
7	78.12%	75.72%	72.59%	69.37%	66.43%	63.69%	60.60%
8	70.88%	69.50%	67.45%	65.24%	63.15%	61.12%	58.74%
9	66.64%	65.73%	64.25%	62.58%	60.98%	59.38%	57.46%
10	63.85%	63.20%	62.05%	60.73%	59.44%	58.13%	56.51%
11	61.88%	61.39%	60.46%	59.37%	58.29%	57.18%	55.79%

Table 4.066 CALIFORNIA GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							77.74%
4				87.25%	77.48%	71.06%	65.99%
5	88.63%	81.80%	76.25%	71.63%	67.71%	64.65%	61.88%
6	74.00%	71.07%	68.36%	65.87%	63.58%	61.65%	59.80%
7	67.95%	66.22%	64.52%	62.87%	61.29%	59.91%	58.53%
8	64.64%	63.45%	62.24%	61.04%	59.85%	58.78%	57.68%
9	62.56%	61.67%	60.74%	59.79%	58.84%	57.98%	57.07%
10	61.12%	60.42%	59.67%	58.90%	58.11%	57.38%	56.61%
11	60.44%	59.50%	58.87%	58.22%	57.55%	56.92%	56.26%

The Alberta Old Gas terms provide a government take that is 1 – 6% percentage points government take higher than Alberta New Gas. In general, this difference is again not very large.

Both New Gas and Old Gas are strongly price regressive, despite a price related royalty formula which originally meant to create a system that would be progressive with prices. However, the select prices were keyed in so low that under current circumstances gas wells under these select prices are uneconomic. Therefore for the price range from US \$ 3 to US \$ 11 per Mcf, both fiscal systems are now strongly price regressive.

Both New Gas and Old Gas are cost progressive up to a certain cost level and then become cost regressive. New Gas and Old Gas behave the same in this respect since both are based on the low well productivity allowance based on a level of 16,900 cu meter per day. The degree to which the system is cost progressive depends on the price level. For US \$ 5 per Mcf the system is cost progressive up to Cost Level 6 for US \$ 9 per Mcf it is cost progressive up to Cost Level 2.

It is not in the interest of Alberta that the gas fiscal systems are regressive for price and partially regressive for costs.

All Lower 48 US states have much higher government takes than New Gas and for Cost Levels 7 through 4 also for Old Gas. There is therefore considerable “space” for improving the Alberta terms under higher prices as well as under low cost conditions.

5% Discounted Government Take (real)

Following seven tables provide an overview of the 5% discounted government take.

Table 4.007 ALBERTA-NEW GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						86.65%	73.58%
5	83.22%	85.07%	81.84%	79.33%	74.65%	69.50%	64.47%
6	56.16%	62.27%	64.55%	66.23%	65.46%	63.21%	60.40%
7	49.45%	55.23%	58.23%	60.77%	61.18%	60.02%	58.19%
8	46.41%	51.81%	54.96%	57.77%	58.70%	58.09%	56.79%
9	44.67%	49.79%	52.95%	55.88%	57.08%	56.80%	55.84%
10	43.64%	48.46%	51.60%	54.57%	55.94%	55.88%	55.14%
11	42.82%	47.51%	50.63%	53.62%	55.10%	55.18%	54.60%

Table 4.017 ALBERTA-OLD GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						97.06%	81.66%
5	88.99%	92.52%	89.47%	87.02%	81.83%	75.93%	70.14%
6	59.03%	66.67%	69.67%	71.91%	71.19%	68.64%	65.41%
7	51.61%	58.70%	62.43%	65.61%	66.22%	64.94%	62.84%
8	48.24%	54.82%	58.68%	62.15%	63.35%	62.70%	61.22%
9	46.32%	52.53%	56.39%	59.96%	61.48%	61.20%	60.10%
10	45.16%	51.01%	54.84%	58.46%	60.16%	60.13%	59.29%
11	44.25%	49.94%	53.73%	57.36%	59.18%	59.32%	58.67%

Table 4.027 TEXAS GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							84.38%
4					87.37%	78.50%	71.30%
5		95.06%	87.29%	80.65%	74.92%	70.38%	66.22%
6	84.37%	80.49%	76.53%	72.81%	69.34%	66.39%	63.51%
7	75.98%	73.65%	71.10%	68.60%	66.17%	64.02%	61.84%
8	71.29%	69.67%	67.84%	65.98%	64.13%	62.44%	60.69%
9	68.29%	67.07%	65.66%	64.19%	62.70%	61.32%	59.87%
10	66.20%	65.24%	64.09%	62.89%	61.65%	60.48%	59.24%
11	64.67%	63.88%	62.92%	61.90%	60.84%	59.83%	58.75%

Table 4.037 NEW MEXICO GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					98.25%	84.20%	74.32%
5				84.69%	77.42%	72.03%	67.33%
6	87.73%	82.93%	78.24%	74.02%	70.22%	67.10%	64.11%
7	76.85%	74.34%	71.65%	69.05%	66.58%	64.43%	62.27%
8	71.45%	69.84%	68.01%	66.18%	64.37%	62.75%	61.07%
9	68.23%	67.07%	65.71%	64.31%	62.90%	61.60%	60.23%
10	66.08%	65.19%	64.12%	62.99%	61.84%	60.76%	59.61%
11	64.56%	63.84%	62.96%	62.02%	61.05%	60.13%	59.13%

Table 4.047 COLORADO GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							92.78%
4					93.59%	79.79%	69.80%
5		99.41%	89.07%	80.53%	73.61%	68.40%	63.34%
6	81.49%	78.07%	73.86%	69.85%	66.35%	63.36%	60.35%
7	71.22%	69.61%	67.28%	64.85%	62.65%	60.63%	58.51%
8	66.18%	65.20%	63.64%	62.00%	60.41%	58.96%	57.33%
9	63.18%	62.52%	61.39%	60.13%	58.96%	57.80%	56.51%
10	61.20%	60.71%	59.83%	58.87%	57.91%	56.98%	55.91%
11	59.84%	59.44%	58.73%	57.92%	57.15%	56.36%	55.45%

Table 4.057 WYOMING GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						99.24%	80.41%
5				97.17%	85.22%	76.09%	68.34%
6	97.91%	91.54%	84.61%	78.27%	72.73%	68.07%	63.27%
7	80.32%	77.52%	73.89%	70.25%	66.83%	63.76%	60.45%
8	72.23%	70.62%	68.28%	65.80%	63.40%	61.13%	58.60%
9	67.58%	66.52%	64.84%	62.99%	61.15%	59.37%	57.32%
10	64.56%	63.80%	62.50%	61.04%	59.56%	58.10%	56.39%
11	62.45%	61.86%	60.81%	59.61%	58.38%	57.14%	55.67%

Table 4.067 CALIFORNIA GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							80.15%
4				93.00%	80.49%	72.71%	66.81%
5	94.25%	86.05%	79.21%	73.66%	69.02%	65.47%	62.34%
6	76.28%	73.02%	69.87%	67.00%	64.37%	62.18%	60.10%
7	69.29%	67.42%	65.49%	63.64%	61.85%	60.29%	58.76%
8	65.57%	64.30%	62.95%	61.60%	60.27%	59.07%	57.86%
9	63.25%	62.32%	61.29%	60.24%	59.18%	58.22%	57.22%
10	61.68%	60.94%	60.12%	59.27%	58.39%	57.59%	56.74%
11	60.82%	59.94%	59.25%	58.54%	57.79%	57.10%	56.37%

The results for the 5% Discounted Government Take are very similar to the Undiscounted Government Take.

The Alberta systems are strongly price regressive and partially cost regressive. In general for the high cost low productivity wells the government take is much higher in the US than in Alberta.

IRR

Following is a review of the IRR.

Table 4.008 ALBERTA-NEW GAS WELL
IRR (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						15.26%	51.63%
5	9.96%	10.55%	14.17%	19.67%	34.28%	68.97%	100.00%
6	43.13%	39.60%	44.51%	55.03%	91.25%	100.00%	100.00%
7	93.78%	82.67%	90.74%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.018 ALBERTA-OLD GAS WELL
IRR (real, 2007 Cdn \$)

HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						7.07%	33.71%
5	8.20%	7.68%	10.04%	13.55%	24.04%	49.63%	100.00%
6	39.59%	33.94%	36.23%	42.33%	67.13%	100.00%	100.00%
7	86.21%	71.16%	73.76%	86.46%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.028 TEXAS GAS WELL
IRR (real, 2007 Cdn \$)

HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							37.31%
4					23.25%	62.86%	100.00%
5		9.95%	22.11%	42.97%	92.88%	100.00%	100.00%
6	30.87%	42.69%	67.37%	100.00%	100.00%	100.00%	100.00%
7	76.48%	99.57%	100.00%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.038 NEW MEXICO GAS WELL
IRR (real, 2007 Cdn \$)

HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					6.56%	31.31%	100.00%
5				26.53%	59.93%	100.00%	100.00%
6	20.66%	30.70%	49.82%	87.34%	100.00%	100.00%	100.00%
7	61.41%	79.92%	100.00%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.048 COLORADO GAS WELL
IRR (real, 2007 Cdn \$)
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							15.02%
4					12.63%	50.47%	100.00%
5		5.48%	17.63%	39.21%	91.94%	100.00%	100.00%
6	32.19%	44.28%	71.90%	100.00%	100.00%	100.00%	100.00%
7	89.98%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.058 WYOMING GAS WELL
IRR (real, 2007 Cdn \$)
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						5.96%	65.15%
5				8.21%	34.02%	97.21%	100.00%
6	7.08%	15.22%	30.56%	59.62%	100.00%	100.00%	100.00%
7	43.24%	57.85%	93.63%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.068 CALIFORNIA GAS WELL
IRR (real, 2007 Cdn \$)
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							37.95%
4				10.19%	30.45%	74.84%	100.00%
5	9.45%	18.16%	32.20%	57.13%	100.00%	100.00%	100.00%
6	45.59%	60.08%	92.87%	100.00%	100.00%	100.00%	100.00%
7	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

The IRR behavior of individual gas and oil wells is very much determined by the rapid decline rate of these wells. Most economic wells pay out in a matter of a few months or a few years. This creates an environment where by the well is either uneconomic or very economic from an IRR perspective.

The IRR is therefore not much of guidance to select wells that are more or less attractive. However, the tables identify clearly the fact that in the Lower 48 US States more cost-price combinations are uneconomic with an IRR below 5%.

Under current cost conditions it seems that the break even price for a dry gas well in Alberta is about US \$ 4.50 while it is US \$ 5.00 in most Lower 48 US States.

Alberta therefore clearly provides better protection to the investor under low prices than the in the US states.

PFR10

Following is a review of the PFR10.

Table 4.009 **ALBERTA-NEW** **GAS WELL**
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						1.07	1.43
5	1.00	1.01	1.06	1.13	1.29	1.56	2.09
6	1.33	1.34	1.40	1.50	1.72	2.07	2.76
7	1.66	1.66	1.75	1.87	2.14	2.57	3.43
8	1.99	1.99	2.09	2.23	2.56	3.07	4.10
9	2.31	2.32	2.43	2.60	2.98	3.58	4.77
10	2.56	2.65	2.78	2.97	3.40	4.08	5.44
11	2.88	2.98	3.12	3.34	3.82	4.58	6.11

Table 4.019 **ALBERTA-OLD** **GAS WELL**
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						0.96	1.28
5	0.98	0.97	1.00	1.05	1.19	1.43	1.90
6	1.30	1.29	1.33	1.40	1.58	1.90	2.52
7	1.63	1.61	1.66	1.75	1.98	2.36	3.15
8	1.95	1.92	1.99	2.09	2.37	2.83	3.77
9	2.27	2.24	2.32	2.44	2.76	3.30	4.40
10	2.52	2.56	2.65	2.79	3.16	3.77	5.02
11	2.83	2.88	2.98	3.14	3.55	4.24	5.64

Table 4.029 TEXAS GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							1.22
4					1.12	1.37	1.84
5		1.00	1.11	1.26	1.50	1.83	2.46
6	1.17	1.26	1.39	1.58	1.88	2.29	3.08
7	1.41	1.52	1.68	1.90	2.26	2.76	3.70
8	1.65	1.77	1.96	2.22	2.64	3.22	4.31
9	1.89	2.03	2.25	2.54	3.02	3.68	4.93
10	2.13	2.29	2.53	2.86	3.40	4.14	5.55
11	2.38	2.55	2.81	3.18	3.78	4.60	6.17

Table 4.039 NEW MEXICO GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					0.97	1.17	1.55
5				1.14	1.34	1.62	2.16
6	1.09	1.17	1.29	1.45	1.71	2.08	2.77
7	1.32	1.42	1.57	1.77	2.09	2.53	3.37
8	1.56	1.67	1.85	2.08	2.46	2.98	3.98
9	1.80	1.93	2.12	2.40	2.83	3.44	4.59
10	2.04	2.18	2.40	2.71	3.21	3.89	5.20
11	2.28	2.43	2.68	3.03	3.58	4.34	5.80

Table 4.049 COLORADO GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							1.04
4					1.02	1.26	1.71
5		0.96	1.06	1.21	1.44	1.76	2.37
6	1.16	1.25	1.38	1.57	1.86	2.26	3.04
7	1.43	1.53	1.69	1.92	2.27	2.76	3.70
8	1.70	1.81	2.00	2.26	2.68	3.25	4.36
9	1.96	2.09	2.31	2.61	3.08	3.75	5.01
10	2.22	2.37	2.61	2.95	3.49	4.24	5.67
11	2.48	2.64	2.92	3.29	3.89	4.73	6.33

Table 4.059 WYOMING GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						0.97	1.34
5				0.98	1.18	1.47	2.01
6	0.97	1.05	1.17	1.33	1.60	1.97	2.68
7	1.24	1.33	1.48	1.68	2.01	2.47	3.36
8	1.50	1.61	1.79	2.03	2.43	2.98	4.04
9	1.77	1.89	2.10	2.38	2.84	3.48	4.71
10	2.04	2.18	2.41	2.73	3.26	3.99	5.39
11	2.30	2.46	2.72	3.08	3.67	4.49	6.07

Table 4.069 CALIFORNIA GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							1.22
4				1.00	1.17	1.41	1.86
5	1.00	1.07	1.18	1.33	1.56	1.89	2.49
6	1.24	1.34	1.47	1.66	1.95	2.36	3.13
7	1.49	1.60	1.77	1.99	2.34	2.84	3.77
8	1.74	1.87	2.06	2.32	2.73	3.31	4.40
9	1.99	2.13	2.35	2.65	3.13	3.78	5.04
10	2.24	2.40	2.64	2.98	3.52	4.26	5.67
11	2.41	2.66	2.93	3.30	3.91	4.73	6.31

Contrary to the IRR, the PFR10 provides a very good profitability indicator to differentiate in well economics.

As can be expected the difference in profitability between the New Gas terms and the Old Gas terms is not very significant. New Gas terms provide for a slightly better profitability.

High cost low productivity wells are far more attractive in Alberta than in any of the Lower 48 US States. However, for the Low cost high productivity wells the differences are not significant and in some case terms from US states are more attractive.

NPV10/BOE

Following is the NPV10/BOE analysis.

Table 4.010
NPV10/BOE
HENRY HUB
US \$

ALBERTA-NEW GAS WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$0.39	\$1.77
5	\$0.00	\$0.07	\$0.53	\$1.07	\$1.99	\$3.12	\$4.48
6	\$3.61	\$3.40	\$3.67	\$4.04	\$4.84	\$5.92	\$7.26
7	\$7.22	\$6.73	\$6.82	\$7.01	\$7.69	\$8.72	\$10.03
8	\$10.83	\$10.06	\$9.97	\$9.98	\$10.53	\$11.51	\$12.81
9	\$14.44	\$13.39	\$13.11	\$12.95	\$13.38	\$14.31	\$15.58
10	\$17.61	\$16.71	\$16.26	\$15.92	\$16.23	\$17.11	\$18.35
11	\$21.19	\$20.04	\$19.41	\$18.89	\$19.08	\$19.90	\$21.13

Table 4.020
NPV10/BOE
HENRY HUB
US \$

ALBERTA-OLD GAS WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						-\$0.24	\$1.14
5	-\$0.23	-\$0.32	\$0.01	\$0.42	\$1.27	\$2.37	\$3.72
6	\$3.32	\$2.90	\$3.02	\$3.23	\$3.93	\$4.97	\$6.30
7	\$6.87	\$6.13	\$6.03	\$6.03	\$6.59	\$7.58	\$8.87
8	\$10.43	\$9.36	\$9.05	\$8.84	\$9.26	\$10.18	\$11.45
9	\$13.98	\$12.59	\$12.06	\$11.64	\$11.92	\$12.79	\$14.03
10	\$17.10	\$15.82	\$15.08	\$14.45	\$14.59	\$15.39	\$16.61
11	\$20.62	\$19.04	\$18.09	\$17.25	\$17.25	\$18.00	\$19.19

Table 4.030
NPV10/BOE
HENRY HUB
US \$

TEXAS GAS WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.92
4					\$0.82	\$2.07	\$3.47
5		-\$0.01	\$1.01	\$2.13	\$3.38	\$4.63	\$6.03
6	\$1.82	\$2.61	\$3.61	\$4.72	\$5.95	\$7.19	\$8.58
7	\$4.48	\$5.22	\$6.20	\$7.30	\$8.52	\$9.75	\$11.14
8	\$7.14	\$7.83	\$8.80	\$9.88	\$11.09	\$12.31	\$13.69
9	\$9.80	\$10.44	\$11.39	\$12.47	\$13.65	\$14.86	\$16.24
10	\$12.46	\$13.05	\$13.99	\$15.05	\$16.22	\$17.42	\$18.80
11	\$15.13	\$15.66	\$16.58	\$17.63	\$18.79	\$19.98	\$21.35

Table 4.040
NPV10/BOE
HENRY HUB
US \$

NEW MEXICO GAS WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4					-\$0.22	\$0.95	\$2.27
5				\$1.12	\$2.30	\$3.47	\$4.78
6	\$0.94	\$1.68	\$2.62	\$3.66	\$4.82	\$5.99	\$7.29
7	\$3.55	\$4.25	\$5.17	\$6.20	\$7.35	\$8.50	\$9.80
8	\$6.17	\$6.82	\$7.73	\$8.74	\$9.87	\$11.02	\$12.32
9	\$8.78	\$9.38	\$10.28	\$11.28	\$12.40	\$13.53	\$14.83
10	\$11.40	\$11.95	\$12.83	\$13.82	\$14.92	\$16.05	\$17.34
11	\$14.02	\$14.52	\$15.38	\$16.36	\$17.45	\$18.56	\$19.85

Table 4.050
NPV10/BOE
HENRY HUB
US \$

COLORADO GAS WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.17
4					\$0.15	\$1.49	\$2.98
5		-\$0.41	\$0.58	\$1.72	\$2.99	\$4.25	\$5.72
6	\$1.80	\$2.49	\$3.47	\$4.58	\$5.79	\$7.02	\$8.42
7	\$4.76	\$5.37	\$6.31	\$7.40	\$8.57	\$9.78	\$11.15
8	\$7.66	\$8.22	\$9.14	\$10.19	\$11.34	\$12.51	\$13.87
9	\$10.54	\$11.05	\$11.94	\$12.97	\$14.09	\$15.25	\$16.59
10	\$13.40	\$13.86	\$14.73	\$15.73	\$16.83	\$17.97	\$19.30
11	\$16.24	\$16.65	\$17.50	\$18.50	\$19.57	\$20.69	\$22.01

Table 4.060
NPV10/BOE
HENRY HUB
US \$

WYOMING GAS WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						-\$0.20	\$1.43
5				-\$0.13	\$1.22	\$2.62	\$4.22
6	-\$0.29	\$0.47	\$1.51	\$2.70	\$4.03	\$5.38	\$6.99
7	\$2.63	\$3.33	\$4.35	\$5.53	\$6.84	\$8.18	\$9.75
8	\$5.54	\$6.19	\$7.19	\$8.36	\$9.65	\$10.98	\$12.55
9	\$8.46	\$9.05	\$10.03	\$11.18	\$12.46	\$13.79	\$15.35
10	\$11.37	\$11.91	\$12.88	\$14.01	\$15.27	\$16.59	\$18.14
11	\$14.28	\$14.76	\$15.72	\$16.84	\$18.08	\$19.39	\$20.94

Table 4.070
NPV10/BOE
HENRY HUB
US \$

CALIFORNIA GAS WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$0.92
4				\$0.01	\$1.16	\$2.29	\$3.55
5	-\$0.05	\$0.73	\$1.65	\$2.67	\$3.80	\$4.93	\$6.18
6	\$2.69	\$3.41	\$4.32	\$5.33	\$6.45	\$7.56	\$8.80
7	\$5.42	\$6.10	\$6.99	\$7.99	\$9.09	\$10.19	\$11.43
8	\$8.16	\$8.79	\$9.66	\$10.64	\$11.73	\$12.82	\$14.06
9	\$10.90	\$11.47	\$12.33	\$13.30	\$14.37	\$15.46	\$16.69
10	\$13.64	\$14.16	\$15.00	\$15.96	\$17.01	\$18.09	\$19.31
11	\$15.95	\$16.84	\$17.67	\$18.61	\$19.65	\$20.72	\$21.94

The difference between the New Gas and Old Gas NPV10/BOE is relatively minor. The wells that pay out relatively fast under high prices have a very attractive NPV10/BOE.

There is a considerable difference again between the low productivity high cost wells in Alberta and the Lower 48 US States. The profitability is significantly higher in Alberta. This is in particular true for the critical US \$ 6 – 8 range for Henry Hub prices. The strong value creation under these prices in Alberta for gas, compared to the Lower 48 US States is a very important reason for the strong drilling activity in Alberta.

4.2. Analysis of oil well without associated gas

Following is the economic-fiscal analysis of an oil well without associated gas.

Gross Revenues per barrel

For the three Alberta fiscal systems the gross revenues per barrel are, of course, the same under the assumptions in this report. Therefore, only the Third Tier map is provided.

Table 4.071 ALBERTA TH TIER OIL WELL
Gross Revenues (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$21.23	\$21.23
30		\$32.59	\$32.59	\$32.59	\$32.59	\$32.59	\$32.59
40	\$43.95	\$43.95	\$43.95	\$43.95	\$43.95	\$43.95	\$43.95
50	\$55.32	\$55.32	\$55.32	\$55.32	\$55.32	\$55.32	\$55.32
60	\$66.68	\$66.68	\$66.68	\$66.68	\$66.68	\$66.68	\$66.68
70	\$78.05	\$78.05	\$78.05	\$78.05	\$78.05	\$78.05	\$78.05
80	\$89.41	\$89.41	\$89.41	\$89.41	\$89.41	\$89.41	\$89.41
90	\$100.77	\$100.77	\$100.77	\$100.77	\$100.77	\$100.77	\$100.77
100	\$112.14	\$112.14	\$112.14	\$112.14	\$112.14	\$112.14	\$112.14

Table 4.101 TEXAS OIL WELL
Gross Revenues (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$33.89	\$33.89	\$33.89
40			\$45.25	\$45.25	\$45.25	\$45.25	\$45.25
50	\$56.62	\$56.62	\$56.62	\$56.62	\$56.62	\$56.62	\$56.62
60	\$67.98	\$67.98	\$67.98	\$67.98	\$67.98	\$67.98	\$67.98
70	\$79.35	\$79.35	\$79.35	\$79.35	\$79.35	\$79.35	\$79.35
80	\$90.71	\$90.71	\$90.71	\$90.71	\$90.71	\$90.71	\$90.71
90	\$102.07	\$102.07	\$102.07	\$102.07	\$102.07	\$102.07	\$102.07
100	\$113.44	\$113.44	\$113.44	\$113.44	\$113.44	\$113.44	\$113.44

Table 4.111 NEW MEXICO OIL WELL
Gross Revenues (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$33.09	\$33.09	\$33.09
40			\$44.45	\$44.45	\$44.45	\$44.45	\$44.45
50	\$55.82	\$55.82	\$55.82	\$55.82	\$55.82	\$55.82	\$55.82
60	\$67.18	\$67.18	\$67.18	\$67.18	\$67.18	\$67.18	\$67.18
70	\$78.55	\$78.55	\$78.55	\$78.55	\$78.55	\$78.55	\$78.55
80	\$89.91	\$89.91	\$89.91	\$89.91	\$89.91	\$89.91	\$89.91
90	\$101.27	\$101.27	\$101.27	\$101.27	\$101.27	\$101.27	\$101.27
100	\$112.64	\$112.64	\$112.64	\$112.64	\$112.64	\$112.64	\$112.64

Table 4.121 COLORADO OIL WELL
Gross Revenues (\$ Cdn) per barrel
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$33.09	\$33.09	\$33.09
40		\$44.45	\$44.45	\$44.45	\$44.45	\$44.45	\$44.45
50	\$55.82	\$55.82	\$55.82	\$55.82	\$55.82	\$55.82	\$55.82
60	\$67.18	\$67.18	\$67.18	\$67.18	\$67.18	\$67.18	\$67.18
70	\$78.55	\$78.55	\$78.55	\$78.55	\$78.55	\$78.55	\$78.55
80	\$89.91	\$89.91	\$89.91	\$89.91	\$89.91	\$89.91	\$89.91
90	\$101.27	\$101.27	\$101.27	\$101.27	\$101.27	\$101.27	\$101.27
100	\$112.64	\$112.64	\$112.64	\$112.64	\$112.64	\$112.64	\$112.64

Table 4.131 WYOMING OIL WELL
Gross Revenues (\$ Cdn) per barrel
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$32.84	\$32.84	\$32.84
40		\$44.20	\$44.20	\$44.20	\$44.20	\$44.20	\$44.20
50	\$55.57	\$55.57	\$55.57	\$55.57	\$55.57	\$55.57	\$55.57
60	\$66.93	\$66.93	\$66.93	\$66.93	\$66.93	\$66.93	\$66.93
70	\$78.30	\$78.30	\$78.30	\$78.30	\$78.30	\$78.30	\$78.30
80	\$89.66	\$89.66	\$89.66	\$89.66	\$89.66	\$89.66	\$89.66
90	\$101.02	\$101.02	\$101.02	\$101.02	\$101.02	\$101.02	\$101.02
100	\$112.39	\$112.39	\$112.39	\$112.39	\$112.39	\$112.39	\$112.39

Table 4.141 CALIFORNIA OIL WELL
Gross Revenues (\$ Cdn) per barrel
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$22.23
30				\$33.59	\$33.59	\$33.59	\$33.59
40		\$44.95	\$44.95	\$44.95	\$44.95	\$44.95	\$44.95
50	\$56.32	\$56.32	\$56.32	\$56.32	\$56.32	\$56.32	\$56.32
60	\$67.68	\$67.68	\$67.68	\$67.68	\$67.68	\$67.68	\$67.68
70	\$79.05	\$79.05	\$79.05	\$79.05	\$79.05	\$79.05	\$79.05
80	\$90.41	\$90.41	\$90.41	\$90.41	\$90.41	\$90.41	\$90.41
90	\$101.77	\$101.77	\$101.77	\$101.77	\$101.77	\$101.77	\$101.77
100	\$113.14	\$113.14	\$113.14	\$113.14	\$113.14	\$113.14	\$113.14

As can be expected, the differences in gross revenues are directly related to the differentials that were provided in Table 3.2 of this report.

Total Expenditures per barrel

The total expenditures per barrel were assumed to be identical. Therefore, only the Alberta Third Tier map is provided.

Table 4.072 ALBERTA TH TIER OIL WELL
Total expenditures (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$16.82	\$14.85
30		\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85
40	\$34.43	\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85
50	\$34.43	\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85
60	\$34.43	\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85
70	\$34.43	\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85
80	\$34.43	\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85
90	\$34.43	\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85
100	\$34.43	\$30.68	\$26.64	\$23.04	\$19.89	\$16.82	\$14.85

Divisible Income per barrel

Following are the maps for the divisible income per barrel. Again for the three Alberta cases this is the same.

Table 4.073 ALBERTA TH TIER OIL WELL
Divisible Income (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$4.41	\$6.38
30		\$1.91	\$5.95	\$9.55	\$12.70	\$15.78	\$17.74
40	\$9.52	\$13.27	\$17.31	\$20.91	\$24.07	\$27.14	\$29.11
50	\$20.88	\$24.64	\$28.67	\$32.28	\$35.43	\$38.50	\$40.47
60	\$32.25	\$36.00	\$40.04	\$43.64	\$46.79	\$49.87	\$51.83
70	\$43.61	\$47.37	\$51.40	\$55.01	\$58.16	\$61.23	\$63.20
80	\$54.97	\$58.73	\$62.76	\$66.37	\$69.52	\$72.59	\$74.56
90	\$66.34	\$70.09	\$74.13	\$77.73	\$80.89	\$83.96	\$85.92
100	\$77.70	\$81.46	\$85.49	\$89.10	\$92.25	\$95.32	\$97.29

Table 4.103 TEXAS OIL WELL

Divisible Income (\$ Cdn) per barrel

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$14.00	\$17.08	\$19.04
40			\$18.61	\$22.21	\$25.37	\$28.44	\$30.41
50	\$22.18	\$25.94	\$29.97	\$33.58	\$36.73	\$39.80	\$41.77
60	\$33.55	\$37.30	\$41.34	\$44.94	\$48.09	\$51.17	\$53.13
70	\$44.91	\$48.67	\$52.70	\$56.31	\$59.46	\$62.53	\$64.50
80	\$56.27	\$60.03	\$64.06	\$67.67	\$70.82	\$73.89	\$75.86
90	\$67.64	\$71.39	\$75.43	\$79.03	\$82.19	\$85.26	\$87.22
100	\$79.00	\$82.76	\$86.79	\$90.40	\$93.55	\$96.62	\$98.59

Table 4.113 NEW MEXICO OIL WELL

Divisible Income (\$ Cdn) per barrel

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$13.20	\$16.28	\$18.24
40			\$17.81	\$21.41	\$24.57	\$27.64	\$29.61
50	\$21.38	\$25.14	\$29.17	\$32.78	\$35.93	\$39.00	\$40.97
60	\$32.75	\$36.50	\$40.54	\$44.14	\$47.29	\$50.37	\$52.33
70	\$44.11	\$47.87	\$51.90	\$55.51	\$58.66	\$61.73	\$63.70
80	\$55.47	\$59.23	\$63.26	\$66.87	\$70.02	\$73.09	\$75.06
90	\$66.84	\$70.59	\$74.63	\$78.23	\$81.39	\$84.46	\$86.42
100	\$78.20	\$81.96	\$85.99	\$89.60	\$92.75	\$95.82	\$97.79

Table 4.123 COLORADO OIL WELL

Divisible Income (\$ Cdn) per barrel

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$13.20	\$16.28	\$18.24
40		\$13.77	\$17.81	\$21.41	\$24.57	\$27.64	\$29.61
50	\$21.38	\$25.14	\$29.17	\$32.78	\$35.93	\$39.00	\$40.97
60	\$32.75	\$36.50	\$40.54	\$44.14	\$47.29	\$50.37	\$52.33
70	\$44.11	\$47.87	\$51.90	\$55.51	\$58.66	\$61.73	\$63.70
80	\$55.47	\$59.23	\$63.26	\$66.87	\$70.02	\$73.09	\$75.06
90	\$66.84	\$70.59	\$74.63	\$78.23	\$81.39	\$84.46	\$86.42
100	\$78.20	\$81.96	\$85.99	\$89.60	\$92.75	\$95.82	\$97.79

Table 4.133 WYOMING OIL WELL
Divisible Income (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$12.95	\$16.03	\$17.99
40			\$17.56	\$21.16	\$24.32	\$27.39	\$29.36
50	\$21.13	\$24.89	\$28.92	\$32.53	\$35.68	\$38.75	\$40.72
60	\$32.50	\$36.25	\$40.29	\$43.89	\$47.04	\$50.12	\$52.08
70	\$43.86	\$47.62	\$51.65	\$55.26	\$58.41	\$61.48	\$63.45
80	\$55.22	\$58.98	\$63.01	\$66.62	\$69.77	\$72.84	\$74.81
90	\$66.59	\$70.34	\$74.38	\$77.98	\$81.14	\$84.21	\$86.17
100	\$77.95	\$81.71	\$85.74	\$89.35	\$92.50	\$95.57	\$97.54

Table 4.143 CALIFORNIA OIL WELL
Divisible Income (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$7.38
30				\$10.55	\$13.70	\$16.78	\$18.74
40		\$14.27	\$18.31	\$21.91	\$25.07	\$28.14	\$30.11
50	\$21.88	\$25.64	\$29.67	\$33.28	\$36.43	\$39.50	\$41.47
60	\$33.25	\$37.00	\$41.04	\$44.64	\$47.79	\$50.87	\$52.83
70	\$44.61	\$48.37	\$52.40	\$56.01	\$59.16	\$62.23	\$64.20
80	\$55.97	\$59.73	\$63.76	\$67.37	\$70.52	\$73.59	\$75.56
90	\$67.34	\$71.09	\$75.13	\$78.73	\$81.89	\$84.96	\$86.92
100	\$78.70	\$82.46	\$86.49	\$90.10	\$93.25	\$96.32	\$98.29

The most important issue to observe is that with respect to oil, the differences in divisible income across North America are minor if we assume wells of the same costs. This is in stark contrast to gas wells, where the divisible income under low prices in Alberta was considerably less.

Government Revenues per barrel

Following are the government revenues per barrel for an oil well. This revenues also include royalty income for private land owners.

Table 4.074 ALBERTA TH TIER OIL WELL
Government Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$2.69	\$3.44
30		\$0.93	\$2.79	\$5.04	\$6.96	\$8.56	\$9.60
40	\$3.07	\$4.56	\$6.92	\$10.06	\$12.74	\$14.88	\$16.27
50	\$6.52	\$8.13	\$10.84	\$14.59	\$17.77	\$20.26	\$21.86
60	\$9.96	\$11.68	\$14.70	\$19.00	\$22.64	\$25.45	\$27.26
70	\$13.41	\$15.22	\$18.56	\$23.41	\$27.51	\$30.64	\$32.66
80	\$16.86	\$18.77	\$22.42	\$27.81	\$32.38	\$35.83	\$38.06
90	\$20.30	\$22.32	\$26.28	\$32.22	\$37.25	\$41.02	\$43.46
100	\$23.75	\$25.87	\$30.13	\$36.63	\$42.11	\$46.22	\$48.86

Table 4.084 ALBERTA-NEW OIL WELL
Government Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$3.65	\$4.50
30			\$3.55	\$5.99	\$8.15	\$9.94	\$11.11
40	\$3.81	\$5.45	\$7.91	\$11.12	\$13.96	\$16.24	\$17.73
50	\$7.49	\$9.29	\$12.13	\$15.98	\$19.40	\$22.09	\$23.85
60	\$11.14	\$13.08	\$16.25	\$20.68	\$24.60	\$27.66	\$29.66
70	\$14.78	\$16.86	\$20.38	\$25.37	\$29.80	\$33.22	\$35.47
80	\$18.43	\$20.65	\$24.50	\$30.07	\$35.01	\$38.79	\$41.28
90	\$22.07	\$24.43	\$28.62	\$34.76	\$40.21	\$44.36	\$47.09
100	\$25.72	\$28.22	\$32.75	\$39.45	\$45.41	\$49.93	\$52.89

Table 4.094 ALBERTA-OLD OIL WELL
Government Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			\$4.23	\$7.21	\$9.85	\$11.99	\$13.38
40	\$4.00	\$5.75	\$8.47	\$12.12	\$15.35	\$17.91	\$19.59
50	\$7.68	\$9.60	\$12.71	\$17.03	\$20.85	\$23.84	\$25.80
60	\$11.37	\$13.44	\$16.95	\$21.93	\$26.36	\$29.77	\$32.01
70	\$15.05	\$17.29	\$21.19	\$26.84	\$31.86	\$35.69	\$38.21
80	\$18.74	\$21.14	\$25.44	\$31.75	\$37.36	\$41.62	\$44.42
90	\$22.42	\$24.99	\$29.68	\$36.66	\$42.86	\$47.55	\$50.63
100	\$26.11	\$28.84	\$33.92	\$41.57	\$48.36	\$53.48	\$56.84

Table 4.104 TEXAS OIL WELL
Government & Private Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$11.96	\$12.96	\$13.64
40			\$15.68	\$16.94	\$18.01	\$19.01	\$19.69
50	\$19.02	\$20.29	\$21.74	\$23.00	\$24.07	\$25.06	\$25.74
60	\$25.07	\$26.34	\$27.79	\$29.05	\$30.12	\$31.11	\$31.80
70	\$31.12	\$32.39	\$33.84	\$35.10	\$36.17	\$37.16	\$37.85
80	\$37.17	\$38.44	\$39.89	\$41.15	\$42.22	\$43.22	\$43.90
90	\$43.22	\$44.49	\$45.94	\$47.20	\$48.27	\$49.27	\$49.95
100	\$49.27	\$50.54	\$51.99	\$53.25	\$54.32	\$55.32	\$56.00

Table 4.114 NEW MEXICO OIL WELL
Government & Private Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$11.38	\$12.51	\$13.28
40			\$15.05	\$16.47	\$17.68	\$18.81	\$19.58
50	\$18.30	\$19.73	\$21.35	\$22.77	\$23.98	\$25.11	\$25.88
60	\$24.60	\$26.03	\$27.65	\$29.07	\$30.28	\$31.41	\$32.18
70	\$30.90	\$32.33	\$33.95	\$35.37	\$36.58	\$37.71	\$38.48
80	\$37.20	\$38.63	\$40.25	\$41.67	\$42.88	\$44.01	\$44.78
90	\$43.50	\$44.93	\$46.55	\$47.97	\$49.18	\$50.31	\$51.08
100	\$49.80	\$51.23	\$52.85	\$54.27	\$55.48	\$56.61	\$57.37

Table 4.124 COLORADO OIL WELL
Government & Private Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$11.29	\$12.24	\$12.97
40		\$12.81	\$14.45	\$15.82	\$16.93	\$17.93	\$18.69
50	\$17.14	\$18.45	\$20.09	\$21.46	\$22.63	\$23.68	\$24.47
60	\$22.78	\$24.09	\$25.76	\$27.19	\$28.39	\$29.48	\$30.28
70	\$28.42	\$29.81	\$31.50	\$32.97	\$34.18	\$35.31	\$36.12
80	\$34.19	\$35.60	\$37.29	\$38.77	\$40.02	\$41.16	\$41.98
90	\$40.10	\$41.48	\$43.12	\$44.60	\$45.86	\$47.02	\$47.84
100	\$46.03	\$47.41	\$48.97	\$50.45	\$51.72	\$52.89	\$53.72

Table 4.134 WYOMING OIL WELL
Government & Private Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$12.17	\$13.01	\$13.68
40			\$15.62	\$16.88	\$17.89	\$18.74	\$19.41
50	\$18.62	\$19.81	\$21.34	\$22.60	\$23.61	\$24.46	\$25.13
60	\$24.35	\$25.54	\$27.06	\$28.33	\$29.34	\$30.19	\$30.86
70	\$30.07	\$31.26	\$32.79	\$34.05	\$35.06	\$35.91	\$36.58
80	\$35.79	\$36.99	\$38.51	\$39.78	\$40.78	\$41.63	\$42.30
90	\$41.52	\$42.71	\$44.23	\$45.50	\$46.51	\$47.36	\$48.03
100	\$47.24	\$48.43	\$49.96	\$51.22	\$52.23	\$53.08	\$53.75

Table 4.144 CALIFORNIA OIL WELL
Government & Private Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$6.31
30				\$9.16	\$10.40	\$11.60	\$12.38
40		\$12.16	\$13.79	\$15.23	\$16.47	\$17.66	\$18.44
50	\$16.75	\$18.23	\$19.85	\$21.29	\$22.53	\$23.73	\$24.51
60	\$22.81	\$24.29	\$25.92	\$27.36	\$28.60	\$29.79	\$30.57
70	\$28.88	\$30.36	\$31.98	\$33.42	\$34.66	\$35.86	\$36.64
80	\$34.94	\$36.42	\$38.05	\$39.49	\$40.73	\$41.92	\$42.70
90	\$41.01	\$42.49	\$44.11	\$45.55	\$46.79	\$47.99	\$48.77
100	\$47.07	\$48.55	\$50.18	\$51.62	\$52.86	\$54.05	\$54.83

As intended, the government revenues per barrel in Alberta for Old Oil are somewhat higher than for New Oil, which are in turn somewhat higher than for Third Tier Oil. However, the differences are relatively minor.

It is clear that in the Lower 48 US States, the government & private revenues per barrel are much higher than for Alberta on the costly low and average productivity wells, while on the Cost Level 1 wells the differences are not very large. Of course, private land owners can negotiate lower royalties for marginal wells. However, this would not remove the much higher corporate income tax, severance taxes and property taxes.

Net Cash per barrel

Table 4.075 ALBERTA TH TIER OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$1.72	\$2.94
30		\$0.98	\$3.15	\$4.51	\$5.74	\$7.21	\$8.15
40	\$6.45	\$8.71	\$10.39	\$10.86	\$11.33	\$12.26	\$12.84
50	\$14.36	\$16.51	\$17.83	\$17.69	\$17.66	\$18.24	\$18.61
60	\$22.28	\$24.33	\$25.34	\$24.64	\$24.16	\$24.42	\$24.57
70	\$30.20	\$32.14	\$32.84	\$31.60	\$30.65	\$30.59	\$30.54
80	\$38.12	\$39.96	\$40.35	\$38.56	\$37.15	\$36.76	\$36.50
90	\$46.04	\$47.77	\$47.85	\$45.51	\$43.64	\$42.93	\$42.47
100	\$53.95	\$55.59	\$55.36	\$52.47	\$50.14	\$49.11	\$48.43

Table 4.085 ALBERTA-NEW OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$0.76	\$1.88
30			\$2.40	\$3.56	\$4.55	\$5.84	\$6.64
40	\$5.71	\$7.82	\$9.40	\$9.80	\$10.11	\$10.90	\$11.37
50	\$13.39	\$15.35	\$16.54	\$16.30	\$16.03	\$16.41	\$16.62
60	\$21.11	\$22.93	\$23.78	\$22.96	\$22.19	\$22.21	\$22.18
70	\$28.83	\$30.50	\$31.03	\$29.63	\$28.35	\$28.01	\$27.73
80	\$36.55	\$38.08	\$38.27	\$36.30	\$34.52	\$33.80	\$33.28
90	\$44.26	\$45.66	\$45.51	\$42.97	\$40.68	\$39.60	\$38.84
100	\$51.98	\$53.24	\$52.75	\$49.64	\$46.84	\$45.39	\$44.39

Table 4.095 ALBERTA-OLD OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			\$1.72	\$2.34	\$2.85	\$3.79	\$4.36
40	\$5.52	\$7.53	\$8.84	\$8.80	\$8.72	\$9.23	\$9.52
50	\$13.20	\$15.04	\$15.96	\$15.25	\$14.58	\$14.66	\$14.67
60	\$20.88	\$22.56	\$23.09	\$21.71	\$20.44	\$20.10	\$19.83
70	\$28.56	\$30.07	\$30.21	\$28.16	\$26.30	\$25.54	\$24.98
80	\$36.24	\$37.59	\$37.33	\$34.62	\$32.16	\$30.97	\$30.14
90	\$43.92	\$45.10	\$44.45	\$41.07	\$38.02	\$36.41	\$35.29
100	\$51.59	\$52.61	\$51.57	\$47.53	\$43.89	\$41.84	\$40.45

Table 4.105 TEXAS OIL WELL

Net Cash (\$ Cdn) per barrel

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$2.04	\$4.11	\$5.40
40			\$2.93	\$5.27	\$7.35	\$9.43	\$10.71
50	\$3.17	\$5.65	\$8.24	\$10.58	\$12.67	\$14.74	\$16.03
60	\$8.48	\$10.96	\$13.55	\$15.89	\$17.98	\$20.05	\$21.34
70	\$13.79	\$16.28	\$18.86	\$21.21	\$23.29	\$25.36	\$26.65
80	\$19.10	\$21.59	\$24.18	\$26.52	\$28.60	\$30.68	\$31.96
90	\$24.42	\$26.90	\$29.49	\$31.83	\$33.92	\$35.99	\$37.28
100	\$29.73	\$32.21	\$34.80	\$37.15	\$39.23	\$41.30	\$42.59

Table 4.115 NEW MEXICO OIL WELL

Net Cash (\$ Cdn) per barrel

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$1.83	\$3.77	\$4.97
40			\$2.76	\$4.94	\$6.89	\$8.83	\$10.03
50	\$3.09	\$5.41	\$7.82	\$10.01	\$11.95	\$13.89	\$15.09
60	\$8.15	\$10.47	\$12.88	\$15.07	\$17.02	\$18.96	\$20.16
70	\$13.21	\$15.53	\$17.95	\$20.14	\$22.08	\$24.02	\$25.22
80	\$18.28	\$20.60	\$23.01	\$25.20	\$27.15	\$29.09	\$30.29
90	\$23.34	\$25.66	\$28.08	\$30.26	\$32.21	\$34.15	\$35.35
100	\$28.40	\$30.73	\$33.14	\$35.33	\$37.27	\$39.21	\$40.41

Table 4.125 COLORADO OIL WELL

Net Cash (\$ Cdn) per barrel

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$1.92	\$4.03	\$5.27
40		\$0.97	\$3.36	\$5.60	\$7.64	\$9.71	\$10.92
50	\$4.24	\$6.69	\$9.08	\$11.32	\$13.30	\$15.32	\$16.50
60	\$9.97	\$12.41	\$14.78	\$16.95	\$18.90	\$20.89	\$22.05
70	\$15.69	\$18.06	\$20.41	\$22.54	\$24.48	\$26.42	\$27.58
80	\$21.29	\$23.63	\$25.97	\$28.10	\$30.01	\$31.94	\$33.09
90	\$26.74	\$29.11	\$31.51	\$33.63	\$35.53	\$37.44	\$38.59
100	\$32.18	\$34.54	\$37.02	\$39.14	\$41.03	\$42.93	\$44.07

Table 4.135 WYOMING OIL WELL
Net Cash (\$ Cdn) per barrel
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$0.79	\$3.01	\$4.31
40			\$1.94	\$4.28	\$6.43	\$8.65	\$9.95
50	\$2.51	\$5.07	\$7.58	\$9.92	\$12.07	\$14.29	\$15.59
60	\$8.15	\$10.71	\$13.22	\$15.56	\$17.71	\$19.93	\$21.23
70	\$13.79	\$16.35	\$18.86	\$21.20	\$23.35	\$25.57	\$26.87
80	\$19.43	\$21.99	\$24.50	\$26.84	\$28.99	\$31.21	\$32.51
90	\$25.07	\$27.63	\$30.14	\$32.48	\$34.63	\$36.85	\$38.15
100	\$30.71	\$33.27	\$35.78	\$38.12	\$40.27	\$42.49	\$43.79

Table 4.145 CALIFORNIA OIL WELL
Net Cash (\$ Cdn) per barrel
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$1.07
30				\$1.39	\$3.30	\$5.18	\$6.36
40		\$2.11	\$4.52	\$6.69	\$8.60	\$10.48	\$11.66
50	\$5.14	\$7.41	\$9.82	\$11.99	\$13.90	\$15.78	\$16.96
60	\$10.43	\$12.71	\$15.12	\$17.29	\$19.20	\$21.08	\$22.26
70	\$15.73	\$18.01	\$20.42	\$22.59	\$24.49	\$26.37	\$27.56
80	\$21.03	\$23.31	\$25.72	\$27.88	\$29.79	\$31.67	\$32.86
90	\$26.33	\$28.61	\$31.02	\$33.18	\$35.09	\$36.97	\$38.16
100	\$31.63	\$33.91	\$36.32	\$38.48	\$40.39	\$42.27	\$43.46

The differences between the three Alberta regimes are again relatively minor. Alberta Old Oil generates somewhat less Net Cash per barrel than New Oil. New Oil generates somewhat less Net Cash per barrel than Alberta Third Tier Oil. In general though oil at US \$ 40 or higher seems to generate an adequate Net Cash regardless of the vintage or well productivity.

On the other hand, oil wells in the Lower 48 US States generate much less Net Cash and low productivity wells are typically uneconomic at US \$ 40 per barrel.

High productivity wells seem to generate about the same amount of Net Cash per barrel in Alberta or any one of the Lower 48 US States.

Undiscounted Government Take

Following are the corresponding tables for the Undiscounted Government Take.

Table 4.076 ALBERTA TH TIER OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						61.05%	53.97%
30		48.69%	47.00%	52.77%	54.80%	54.29%	54.08%
40	32.23%	34.36%	40.00%	48.09%	52.92%	54.83%	55.88%
50	31.21%	32.99%	37.81%	45.20%	50.16%	52.61%	54.01%
60	30.90%	32.43%	36.72%	43.53%	48.38%	51.03%	52.59%
70	30.75%	32.14%	36.10%	42.55%	47.30%	50.04%	51.68%
80	30.66%	31.96%	35.72%	41.91%	46.57%	49.36%	51.04%
90	30.60%	31.84%	35.45%	41.45%	46.05%	48.86%	50.58%
100	30.56%	31.75%	35.25%	41.11%	45.65%	48.48%	50.22%

Table 4.086 ALBERTA-NEW OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						82.79%	70.49%
30			59.68%	62.73%	64.16%	63.01%	62.59%
40	40.05%	41.07%	45.70%	53.15%	57.99%	59.83%	60.93%
50	35.87%	37.70%	42.30%	49.52%	54.75%	57.37%	58.93%
60	34.53%	36.32%	40.59%	47.38%	52.57%	55.46%	57.22%
70	33.90%	35.60%	39.64%	46.12%	51.25%	54.26%	56.12%
80	33.52%	35.16%	39.03%	45.30%	50.35%	53.44%	55.36%
90	33.27%	34.86%	38.61%	44.72%	49.71%	52.83%	54.80%
100	33.10%	34.65%	38.30%	44.28%	49.23%	52.38%	54.37%

Table 4.096 ALBERTA-OLD OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			71.05%	75.48%	77.54%	75.97%	75.41%
40	41.99%	43.29%	48.92%	57.94%	63.79%	66.00%	67.30%
50	36.79%	38.95%	44.32%	52.75%	58.86%	61.92%	63.74%
60	35.25%	37.34%	42.34%	50.26%	56.32%	59.69%	61.75%
70	34.52%	36.51%	41.23%	48.80%	54.78%	58.30%	60.47%
80	34.08%	36.00%	40.53%	47.84%	53.74%	57.34%	59.58%
90	33.80%	35.66%	40.04%	47.16%	52.99%	56.63%	58.93%
100	33.60%	35.41%	39.68%	46.65%	52.43%	56.10%	58.42%

Table 4.106 TEXAS OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					85.43%	75.90%	71.64%
40			84.28%	76.28%	71.01%	66.85%	64.77%
50	85.73%	78.22%	72.52%	68.48%	65.52%	62.97%	61.63%
60	74.73%	70.61%	67.22%	64.63%	62.62%	60.81%	59.84%
70	69.29%	66.56%	64.21%	62.34%	60.83%	59.44%	58.68%
80	66.05%	64.04%	62.26%	60.81%	59.61%	58.48%	57.87%
90	63.90%	62.32%	60.91%	59.72%	58.73%	57.79%	57.26%
100	62.37%	61.07%	59.90%	58.91%	58.07%	57.25%	56.80%

Table 4.116 NEW MEXICO OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					86.17%	76.86%	72.78%
40			84.52%	76.91%	71.95%	68.05%	66.12%
50	85.57%	78.49%	73.19%	69.47%	66.73%	64.38%	63.16%
60	75.12%	71.32%	68.22%	65.85%	64.02%	62.36%	61.48%
70	70.05%	67.55%	65.42%	63.72%	62.35%	61.09%	60.40%
80	67.05%	65.22%	63.63%	62.31%	61.23%	60.21%	59.65%
90	65.08%	63.65%	62.38%	61.32%	60.42%	59.57%	59.10%
100	63.68%	62.51%	61.46%	60.57%	59.81%	59.08%	58.67%

Table 4.126 COLORADO OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					85.47%	75.22%	71.10%
40		92.99%	81.12%	73.87%	68.90%	64.86%	63.12%
50	80.15%	73.40%	68.86%	65.48%	62.98%	60.72%	59.72%
60	69.56%	66.00%	63.54%	61.60%	60.03%	58.53%	57.87%
70	64.43%	62.27%	60.68%	59.39%	58.27%	57.20%	56.70%
80	61.63%	60.10%	58.95%	57.98%	57.15%	56.31%	55.92%
90	59.99%	58.77%	57.78%	57.01%	56.34%	55.67%	55.35%
100	58.86%	57.85%	56.95%	56.31%	55.76%	55.20%	54.93%

Table 4.136 WYOMING OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					93.91%	81.21%	76.06%
40			88.93%	79.76%	73.56%	68.42%	66.11%
50	88.12%	79.61%	73.78%	69.49%	66.18%	63.12%	61.72%
60	74.92%	70.45%	67.18%	64.54%	62.36%	60.23%	59.24%
70	68.56%	65.65%	63.48%	61.63%	60.03%	58.41%	57.65%
80	64.81%	62.71%	61.11%	59.71%	58.45%	57.15%	56.55%
90	62.35%	60.72%	59.47%	58.34%	57.32%	56.24%	55.73%
100	60.60%	59.28%	58.27%	57.33%	56.47%	55.54%	55.11%

Table 4.146 CALIFORNIA OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							85.56%
30				86.82%	75.92%	69.12%	66.04%
40		85.19%	75.30%	69.48%	65.70%	62.76%	61.26%
50	76.53%	71.09%	66.90%	63.98%	61.85%	60.06%	59.10%
60	68.62%	65.65%	63.15%	61.28%	59.84%	58.57%	57.87%
70	64.73%	62.76%	61.03%	59.67%	58.59%	57.62%	57.07%
80	62.43%	60.98%	59.67%	58.61%	57.75%	56.96%	56.51%
90	60.90%	59.76%	58.72%	57.85%	57.15%	56.48%	56.10%
100	59.81%	58.88%	58.01%	57.29%	56.69%	56.12%	55.79%

With respect to the Alberta fiscal systems the maximum royalty rates are achieved as follows:

- Third Tier - Can \$ 58.14
- New - Can \$ 48.60
- Old - Can \$ 30.52

Significant high royalty rates are achieved well before these price levels. As a consequence it is not difficult to understand that under current cost conditions the Alberta fiscal systems for oil are essentially price regressive at each price level.

Only for Alberta Third Tier Oil the system is modestly price progressive below US \$ 40 for Cost Level 1 and 2. In other words, it seems clear that the select price systems and the related maximum royalty levels are now clearly outdated and no longer serve the objective of creating a price progressive system.

Alberta Old and New Oil provide a much higher government take on high productivity wells than Alberta Third Tier Oil. However, for low productivity wells the systems are very similar.

There is an obvious and important difference in government take with the Lower 48 US States. For all states the undiscounted government take is much higher than in Alberta for oil wells in the range of Cost Level 3 through 7. Again this explains the significantly higher drilling activity in Alberta.

The systems in Alberta and the US are fundamentally different in structure. Alberta has a price regressive but cost progressive system, while the US is price and cost regressive.

5% Discounted Government Take (real)

Following is the overview of the 5% Discounted Government Take.

Table 4.077 ALBERTA TH TIER OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						70.52%	58.64%
30		89.21%	54.50%	58.10%	58.63%	56.83%	56.03%
40	34.90%	36.28%	42.11%	50.62%	55.25%	56.63%	57.32%
50	32.31%	33.96%	39.08%	46.93%	51.87%	54.02%	55.16%
60	31.59%	33.10%	37.66%	44.90%	49.78%	52.21%	53.55%
70	31.26%	32.65%	36.88%	43.72%	48.52%	51.08%	52.53%
80	31.07%	32.38%	36.38%	42.95%	47.68%	50.31%	51.82%
90	30.94%	32.20%	36.04%	42.41%	47.07%	49.75%	51.30%
100	30.85%	32.08%	35.79%	42.01%	46.62%	49.32%	50.90%

Table 4.087 ALBERTA-NEW OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						97.25%	77.50%
30			70.10%	69.44%	68.94%	66.18%	65.02%
40	43.90%	43.66%	48.24%	55.99%	60.61%	61.87%	62.57%
50	37.31%	38.96%	43.80%	51.44%	56.67%	58.95%	60.23%
60	35.42%	37.16%	41.69%	48.88%	54.13%	56.78%	58.31%
70	34.54%	36.25%	40.53%	47.40%	52.60%	55.43%	57.08%
80	34.03%	35.69%	39.80%	46.44%	51.57%	54.50%	56.23%
90	33.70%	35.32%	39.30%	45.76%	50.84%	53.83%	55.61%
100	33.47%	35.05%	38.93%	45.25%	50.29%	53.32%	55.13%

Table 4.097 ALB ERTA-OLD OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			84.39%	84.26%	83.86%	80.18%	78.63%
40	46.15%	46.13%	51.80%	61.24%	66.86%	68.42%	69.25%
50	38.30%	40.30%	45.99%	54.92%	61.04%	63.73%	65.23%
60	36.18%	38.25%	43.56%	51.96%	58.10%	61.21%	62.99%
70	35.19%	37.21%	42.22%	50.25%	56.32%	59.64%	61.57%
80	34.62%	36.57%	41.38%	49.13%	55.14%	58.56%	60.58%
90	34.25%	36.15%	40.80%	48.35%	54.29%	57.78%	59.86%
100	33.99%	35.85%	40.38%	47.76%	53.65%	57.18%	59.31%

Table 4.107 TEXAS OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					88.66%	77.55%	72.73%
40			87.33%	78.19%	72.25%	67.59%	65.28%
50	88.71%	80.19%	73.96%	69.50%	66.23%	63.42%	61.96%
60	76.30%	71.76%	68.12%	65.30%	63.11%	61.13%	60.07%
70	70.32%	67.34%	64.85%	62.83%	61.19%	59.68%	58.86%
80	66.80%	64.63%	62.76%	61.20%	59.90%	58.68%	58.01%
90	64.49%	62.79%	61.31%	60.04%	58.97%	57.95%	57.38%
100	62.85%	61.47%	60.24%	59.18%	58.27%	57.39%	56.90%

Table 4.117 NEW MEXICO OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					89.41%	78.47%	73.82%
40			87.51%	78.75%	73.13%	68.75%	66.60%
50	88.47%	80.40%	74.57%	70.43%	67.40%	64.80%	63.45%
60	76.61%	72.41%	69.07%	66.49%	64.47%	62.65%	61.69%
70	71.02%	68.29%	66.02%	64.18%	62.69%	61.31%	60.56%
80	67.76%	65.78%	64.09%	62.68%	61.50%	60.39%	59.78%
90	65.63%	64.09%	62.76%	61.61%	60.65%	59.72%	59.21%
100	64.13%	62.88%	61.78%	60.82%	60.00%	59.20%	58.76%

Table 4.127 COLORADO OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					88.09%	76.13%	71.37%
40		97.77%	83.80%	75.35%	69.66%	65.13%	63.12%
50	82.83%	75.11%	70.02%	66.18%	63.37%	60.86%	59.70%
60	70.92%	66.96%	64.24%	62.05%	60.29%	58.63%	57.85%
70	65.30%	62.93%	61.18%	59.73%	58.48%	57.29%	56.69%
80	62.26%	60.60%	59.34%	58.26%	57.32%	56.39%	55.93%
90	60.49%	59.17%	58.11%	57.25%	56.50%	55.75%	55.36%
100	59.26%	58.19%	57.24%	56.53%	55.90%	55.27%	54.95%

Table 4.137 WYOMING OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					97.29%	82.47%	76.53%
40			92.27%	81.63%	74.56%	68.79%	66.17%
50	91.40%	81.70%	75.21%	70.38%	66.67%	63.29%	61.69%
60	76.55%	71.60%	68.02%	65.08%	62.66%	60.31%	59.18%
70	69.60%	66.42%	64.06%	62.00%	60.23%	58.45%	57.59%
80	65.56%	63.28%	61.55%	59.99%	58.60%	57.18%	56.48%
90	62.92%	61.16%	59.82%	58.57%	57.44%	56.25%	55.67%
100	61.07%	59.64%	58.55%	57.52%	56.56%	55.55%	55.05%

Table 4.147 CALIFORNIA OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							90.12%
30				91.85%	78.51%	70.50%	67.01%
40		89.14%	77.67%	71.00%	66.71%	63.40%	61.75%
50	78.86%	72.64%	68.04%	64.80%	62.45%	60.46%	59.41%
60	69.85%	66.56%	63.88%	61.83%	60.25%	58.86%	58.10%
70	65.55%	63.39%	61.55%	60.08%	58.91%	57.84%	57.25%
80	63.03%	61.45%	60.07%	58.93%	58.01%	57.15%	56.66%
90	61.37%	60.14%	59.04%	58.12%	57.36%	56.64%	56.23%
100	60.20%	59.20%	58.29%	57.52%	56.87%	56.25%	55.90%

The 5% discounted government take shows the same overall pattern as the undiscounted government take. The Alberta system is price regressive and cost progressive, while the US is price and cost regressive. The differences between the two systems are stronger on a 5% discounted basis since the US is also more front end loaded.

IRR

Following is a review of the IRR.

Table 4.078 ALBERTA TH TIER OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						14.13%	29.09%
30		5.56%	17.87%	27.03%	41.60%	78.71%	100.00%
40	37.11%	57.42%	70.40%	78.89%	100.00%	100.00%	100.00%
50	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.088 ALBERTA-NEW OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						5.79%	16.84%
30			13.22%	20.24%	29.98%	54.35%	82.39%
40	31.81%	49.42%	60.54%	66.32%	85.39%	100.00%	100.00%
50	94.29%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.098 ALB ERTA-OLD OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			9.12%	12.18%	16.22%	28.14%	40.89%
40	30.51%	46.68%	54.38%	53.98%	62.80%	100.00%	100.00%
50	91.72%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.108 TEXAS OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					19.29%	59.47%	100.00%
40			22.15%	50.46%	100.00%	100.00%	100.00%
50	21.67%	46.78%	82.94%	100.00%	100.00%	100.00%	100.00%
60	73.65%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.118 NEW MEXICO OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					19.29%	59.47%	100.00%
40			22.15%	50.46%	100.00%	100.00%	100.00%
50	21.67%	46.78%	82.94%	100.00%	100.00%	100.00%	100.00%
60	73.65%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.128 COLORADO OIL WELL
IRR (real, 2007 Cdn \$)
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					21.58%	73.08%	100.00%
40		7.14%	28.02%	62.66%	100.00%	100.00%	100.00%
50	31.37%	61.86%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.138 WYOMING OIL WELL
IRR (real, 2007 Cdn \$)
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					8.49%	47.20%	98.73%
40			14.93%	41.97%	98.25%	100.00%	100.00%
50	16.76%	41.31%	75.99%	100.00%	100.00%	100.00%	100.00%
60	69.20%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 1.148 CALIFORNIA OIL WELL
IRR (real, 2007 Cdn \$)
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							13.63%
30				11.61%	34.89%	91.35%	100.00%
40		16.31%	38.91%	77.11%	100.00%	100.00%	100.00%
50	40.82%	73.44%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

The very high royalties under low prices make oil wells under Alberta Old Oil terms and under low prices and current costs uneconomic. Therefore, these terms are currently counter-productive in this price range. The same is true to a lesser degree for Alberta New Oil terms.

The cost regressive nature of the systems in the Lower 48 US States create an environment in which high cost low productivity wells are uneconomic under oil prices as high as US \$ 40 per barrel.

PFR10

Following is a review of the PFR10.

Table 4.079 ALBERTA TH TIER OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						1.05	1.22
30		0.97	1.11	1.26	1.47	1.80	2.06
40	1.20	1.36	1.54	1.71	1.94	2.34	2.63
50	1.55	1.75	1.97	2.15	2.41	2.87	3.20
60	1.90	2.14	2.40	2.60	2.87	3.41	3.77
70	2.25	2.54	2.83	3.04	3.35	3.95	4.34
80	2.60	2.94	3.30	3.61	4.04	4.81	5.32
90	2.96	3.34	3.78	4.19	4.72	5.67	6.29
100	3.31	3.75	4.26	4.76	5.41	6.53	7.27

Table 4.089 ALBERTA-NEW OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						0.94	1.09
30		0.93	1.03	1.12	1.25	1.48	1.66
40	1.17	1.31	1.45	1.56	1.71	2.01	2.22
50	1.51	1.69	1.88	2.02	2.21	2.59	2.85
60	1.85	2.07	2.31	2.49	2.73	3.21	3.52
70	2.19	2.46	2.74	2.96	3.25	3.82	4.19
80	2.53	2.84	3.17	3.43	3.77	4.44	4.86
90	2.87	3.22	3.60	3.90	4.29	5.05	5.53
100	3.21	3.61	4.03	4.38	4.82	5.67	6.20

Table 4.099 ALB ERTA-OLD OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			0.99	1.03	1.09	1.24	1.37
40	1.16	1.29	1.41	1.48	1.58	1.82	1.99
50	1.50	1.67	1.84	1.94	2.08	2.39	2.61
60	1.84	2.05	2.26	2.39	2.57	2.97	3.23
70	2.18	2.43	2.69	2.85	3.06	3.54	3.84
80	2.52	2.81	3.11	3.30	3.56	4.11	4.46
90	2.86	3.19	3.53	3.76	4.05	4.69	5.08
100	3.20	3.58	3.96	4.21	4.54	5.26	5.70

Table 4.109 TEXAS OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					1.08	1.35	1.57
40			1.09	1.29	1.54	1.93	2.22
50	1.07	1.22	1.41	1.67	2.00	2.50	2.87
60	1.31	1.49	1.73	2.05	2.46	3.08	3.52
70	1.54	1.76	2.05	2.43	2.92	3.65	4.17
80	1.78	2.03	2.37	2.82	3.38	4.23	4.82
90	2.01	2.30	2.69	3.20	3.84	4.80	5.47
100	2.25	2.57	3.01	3.58	4.30	5.38	6.13

Table 4.119 NEW MEXICO OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					1.07	1.32	1.52
40			1.09	1.27	1.51	1.87	2.14
50	1.07	1.21	1.39	1.63	1.94	2.42	2.76
60	1.30	1.46	1.70	2.00	2.38	2.96	3.38
70	1.52	1.72	2.00	2.36	2.82	3.51	4.00
80	1.74	1.98	2.30	2.73	3.26	4.06	4.62
90	1.97	2.24	2.61	3.09	3.69	4.61	5.24
100	2.19	2.49	2.91	3.45	4.13	5.16	5.86

Table 4.129 COLORADO OIL WELL
PFR10 (real, 2007 Cdn \$)
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					1.09	1.37	1.58
40		0.98	1.13	1.32	1.58	1.98	2.27
50	1.12	1.27	1.47	1.73	2.07	2.58	2.95
60	1.38	1.56	1.81	2.14	2.55	3.18	3.63
70	1.63	1.85	2.15	2.54	3.03	3.78	4.31
80	1.88	2.13	2.48	2.94	3.51	4.38	4.98
90	2.12	2.41	2.81	3.33	3.98	4.97	5.65
100	2.36	2.69	3.14	3.73	4.46	5.56	6.32

Table 4.139 WYOMING OIL WELL
PFR10 (real, 2007 Cdn \$)
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					0.99	1.25	1.46
40			1.04	1.23	1.48	1.86	2.16
50	1.04	1.19	1.38	1.63	1.96	2.47	2.85
60	1.29	1.47	1.72	2.04	2.45	3.09	3.54
70	1.54	1.76	2.05	2.44	2.94	3.70	4.23
80	1.79	2.05	2.39	2.85	3.42	4.31	4.92
90	2.04	2.33	2.73	3.25	3.91	4.92	5.61
100	2.29	2.62	3.07	3.66	4.40	5.53	6.30

Table 4.149 CALIFORNIA OIL WELL
PFR10 (real, 2007 Cdn \$)
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							1.03
30				1.01	1.19	1.47	1.68
40		1.04	1.19	1.39	1.65	2.04	2.33
50	1.16	1.31	1.51	1.78	2.11	2.61	2.98
60	1.40	1.58	1.83	2.16	2.57	3.19	3.63
70	1.63	1.85	2.15	2.54	3.02	3.76	4.28
80	1.87	2.12	2.47	2.92	3.48	4.34	4.93
90	2.10	2.39	2.79	3.30	3.94	4.91	5.58
100	2.34	2.66	3.10	3.68	4.40	5.48	6.23

Based on the PFR10, Alberta oil wells show attractive economics at US \$ 40 per barrel over the entire cost range. Of course, Old Oil and New Oil are somewhat less attractive than Third Tier Oil.

For the Cost range from Cost Level 3 through 7, the Lower 48 US States show a much less attractive PFR10 than in Alberta for any of the fiscal systems.

In general, for any price-cost combination, the Alberta Third Tier oil is more profitable than any of the US states reviewed above.

NPV10/BOE

Following is an overview of the NPV10/BOE.

Table 4.080 ALBERTA TH TIER OIL WELL

NPV10/BOE

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$0.40	\$1.50
30		-\$0.67	\$1.15	\$2.29	\$3.41	\$4.83	\$5.71
40	\$4.04	\$6.06	\$7.24	\$7.47	\$7.91	\$8.89	\$9.51
50	\$11.06	\$12.85	\$13.54	\$13.11	\$13.07	\$13.75	\$14.19
60	\$18.09	\$19.66	\$19.89	\$18.86	\$18.38	\$18.78	\$19.06
70	\$25.12	\$26.47	\$26.24	\$24.61	\$23.69	\$23.81	\$23.93
80	\$32.15	\$33.28	\$32.59	\$30.36	\$29.00	\$28.84	\$28.80
90	\$39.18	\$40.08	\$38.94	\$36.11	\$34.31	\$33.87	\$33.67
100	\$46.21	\$46.89	\$45.29	\$41.86	\$39.62	\$38.91	\$38.54

Table 4.090 ALBERTA-NEW OIL WELL

NPV10/BOE

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						-\$0.44	\$0.59
30		-\$1.22	\$0.49	\$1.45	\$2.37	\$3.64	\$4.43
40	\$3.35	\$5.26	\$6.38	\$6.56	\$6.86	\$7.72	\$8.26
50	\$10.17	\$11.80	\$12.41	\$11.91	\$11.67	\$12.18	\$12.51
60	\$17.01	\$18.40	\$18.53	\$17.42	\$16.69	\$16.89	\$17.03
70	\$23.86	\$24.99	\$24.65	\$22.92	\$21.71	\$21.60	\$21.55
80	\$30.70	\$31.59	\$30.77	\$28.43	\$26.73	\$26.31	\$26.07
90	\$37.55	\$38.18	\$36.89	\$33.93	\$31.76	\$31.02	\$30.59
100	\$44.39	\$44.77	\$43.01	\$39.44	\$36.78	\$35.73	\$35.12

Table 4.100
NPV10/BOE
WTI
US \$

ALB ERTA-OLD OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			-\$0.14	\$0.34	\$0.85	\$1.86	\$2.48
40	\$3.18	\$4.98	\$5.87	\$5.65	\$5.61	\$6.25	\$6.66
50	\$9.99	\$11.52	\$11.88	\$10.96	\$10.37	\$10.65	\$10.84
60	\$16.80	\$18.06	\$17.89	\$16.27	\$15.12	\$15.04	\$15.02
70	\$23.61	\$24.59	\$23.90	\$21.58	\$19.88	\$19.44	\$19.19
80	\$30.42	\$31.13	\$29.91	\$26.89	\$24.63	\$23.83	\$23.37
90	\$37.22	\$37.66	\$35.92	\$32.20	\$29.39	\$28.23	\$27.55
100	\$44.03	\$44.20	\$41.93	\$37.51	\$34.15	\$32.62	\$31.73

Table 4.110
NPV10/BOE
WTI
US \$

TEXAS OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$0.79	\$2.68	\$3.82
40			\$1.32	\$3.37	\$5.21	\$7.09	\$8.22
50	\$1.45	\$3.71	\$5.85	\$7.84	\$9.64	\$11.49	\$12.61
60	\$6.16	\$8.35	\$10.37	\$12.30	\$14.06	\$15.90	\$17.01
70	\$10.88	\$12.98	\$14.90	\$16.76	\$18.49	\$20.30	\$21.40
80	\$15.60	\$17.62	\$19.42	\$21.22	\$22.91	\$24.71	\$25.79
90	\$20.32	\$22.26	\$23.95	\$25.68	\$27.34	\$29.11	\$30.19
100	\$25.04	\$26.89	\$28.48	\$30.14	\$31.76	\$33.52	\$34.58

Table 4.120
NPV10/BOE
WTI
US \$

NEW MEXICO OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$0.66	\$2.43	\$3.50
40			\$1.24	\$3.16	\$4.88	\$6.63	\$7.69
50	\$1.44	\$3.56	\$5.55	\$7.41	\$9.10	\$10.83	\$11.88
60	\$5.94	\$7.98	\$9.87	\$11.66	\$13.32	\$15.03	\$16.07
70	\$10.44	\$12.40	\$14.18	\$15.92	\$17.53	\$19.23	\$20.26
80	\$14.93	\$16.82	\$18.50	\$20.17	\$21.75	\$23.43	\$24.45
90	\$19.43	\$21.24	\$22.81	\$24.42	\$25.97	\$27.63	\$28.63
100	\$23.93	\$25.66	\$27.12	\$28.67	\$30.19	\$31.83	\$32.82

Table 4.130
NPV10/BOE
WTI
US \$

COLORADO OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$0.85	\$2.80	\$3.93
40		-\$0.33	\$1.78	\$3.77	\$5.61	\$7.50	\$8.59
50	\$2.45	\$4.67	\$6.66	\$8.58	\$10.32	\$12.13	\$13.19
60	\$7.53	\$9.66	\$11.50	\$13.29	\$14.97	\$16.73	\$17.76
70	\$12.61	\$14.58	\$16.28	\$17.97	\$19.59	\$21.29	\$22.32
80	\$17.58	\$19.44	\$21.01	\$22.62	\$24.18	\$25.85	\$26.85
90	\$22.42	\$24.21	\$25.71	\$27.25	\$28.76	\$30.40	\$31.38
100	\$27.25	\$28.95	\$30.39	\$31.86	\$33.32	\$34.93	\$35.91

Table 4.140
NPV10/BOE
WTI
US \$

WYOMING OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					-\$0.12	\$1.93	\$3.13
40			\$0.53	\$2.64	\$4.58	\$6.61	\$7.79
50	\$0.86	\$3.22	\$5.34	\$7.38	\$9.28	\$11.29	\$12.46
60	\$5.87	\$8.14	\$10.14	\$12.11	\$13.97	\$15.96	\$17.12
70	\$10.88	\$13.06	\$14.95	\$16.85	\$18.67	\$20.64	\$21.79
80	\$15.89	\$17.99	\$19.75	\$21.59	\$23.37	\$25.32	\$26.46
90	\$20.90	\$22.91	\$24.56	\$26.32	\$28.07	\$29.99	\$31.12
100	\$25.91	\$27.83	\$29.36	\$31.06	\$32.76	\$34.67	\$35.79

table 4.150
NPV10/BOE
WTI
US \$

CALIFORNIA OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$0.22
30				\$0.16	\$1.86	\$3.57	\$4.61
40		\$0.69	\$2.74	\$4.61	\$6.27	\$7.96	\$8.99
50	\$3.27	\$5.31	\$7.25	\$9.06	\$10.69	\$12.35	\$13.37
60	\$7.98	\$9.94	\$11.77	\$13.51	\$15.10	\$16.75	\$17.76
70	\$12.69	\$14.56	\$16.28	\$17.95	\$19.51	\$21.14	\$22.14
80	\$17.39	\$19.19	\$20.80	\$22.40	\$23.93	\$25.53	\$26.52
90	\$22.10	\$23.82	\$25.31	\$26.85	\$28.34	\$29.93	\$30.90
100	\$26.81	\$28.44	\$29.82	\$31.30	\$32.75	\$34.32	\$35.29

Alberta for any of the three fiscal systems shows considerable value creation at US \$ 40 per barrel and higher. Again Alberta is far more profitable than the US states for low productivity wells.

4.3. Conclusions for conventional oil and gas

Conventional Gas

Under current cost and price conditions there is no longer a significant difference between New Gas terms and Old Gas terms. Therefore, this distinction is now out dated. It can be recommended to merge the fiscal terms applicable to conventional gas wells into a single fiscal system.

As a result of the significant price and cost increased over the last four years, the system has now become price regressive for the range over US \$ 3 per Mcf. A new relationship has to be established between prices and royalty rates that would make Alberta much more price progressive for gas. The gas royalties appear clearly too high up to about US \$ 4 per Mcf but much too low at US \$ 11 per Mcf.

Also Alberta does not seem to get its fair share on high productivity and therefore low cost gas wells. In general therefore the system could also become somewhat more cost progressive with respect to these wells.

Conventional Oil

The fiscal terms for Third Tier Oil, New Oil and Old Oil are now all clearly outdated. The price progressive nature of the formulas is ineffective since the price levels at which significant royalties need to be paid are now too low. This makes wells uneconomic under low prices, in particular under Old Oil conditions.

The three Alberta fiscal systems for conventional oil are under current cost and price conditions no longer different enough to be relevant. It can therefore be recommended to merge the three fiscal systems into a single concept.

The Alberta systems are all regressive with price and therefore it can be recommended to reverse this and provide for lower royalties under US \$ 40 per barrel and higher royalties under higher prices.

Also a modest improvement can be made in government take on high productivity wells.

5. FISCAL OPTIONS FOR CONVENTIONAL OIL AND GAS

5.1. General concepts and proposed terms

The Alberta gas and oil royalties resulted in various vintages and many adjustments through a variety of royalty programs.

The main reason for this is the relative inflexibility of the underlying formula's. These formula's are based on integrating the price as well as volume of production per well in a joint formula that than results in a single applicable royalty. Price and volume are not independent of each other in the formula's. In other words the formula's are targeted at particular price-volume relationships.

It should be noted that the original formula's had a considerable inherent logic. Obviously, whether a well is economic at 12 barrels per day or not, depends very much on the price. At \$ 2 per barrel the well is uneconomic, but at \$ 200 per barrel the well would be attractive. The previous formula's therefore created royalty rates on the basis of such price-volume combinations.

The inherent problem, however, with such a sensitive formula is that the formula applies only to a certain range of price and volume. If the formula becomes outdated with respect to price, it becomes automatically outdated with respect to volume.

It creates more flexibility and durability if the price and volume have an independent impact on the royalty rate and vary each over a wider range.

Setting the price range and the volume range, of course, imply a certain correlation of price and volume. Therefore, over time this system also needs to be adjusted. However, the separation of the formula for price and for volume, permits the Alberta government to adjust the prices without having to adjust the volumes and thereby creating entirely new "vintages".

It is therefore proposed to make price and volume of production per day per well independent in the newly proposed formula for gas and for oil.

The total royalty rate is simply the sum of the royalty rate based on price and the royalty rate based on volume of well production per day in other words:

$$R\% = R_p\% + R_v\%$$

in which:

R% is the total royalty rate

Rp% is the royalty rate based on price per production unit

Rv% is the royalty rate based on volume of production per day per well

The same overall concept would apply to gas as well as oil. In other words:

$$R_g\% = R_{gp}\% + R_{gv}\%$$

$$R_o\% = R_{op}\% + R_{ov}\%$$

in which the subscript “g” means gas and “o” means oil.

Once, the price and volume components of the total royalty are separated it is possible to use relatively simple linear set of functions in order to define the total royalty rate. There would be a simple linear set of functions for price and for volume.

Proposed Gas Royalty

It is suggested that the royalty for New Gas and Old Gas would be replaced with a simple single formula based on the above principles.

With respect to the gas price, the royalty would be set at 0% at a price of Can \$ 5 per GJ. Over this price level the royalty would increase based on a linear function in such a manner that for every Can \$ 1 per GJ the royalty increases by 3%. At Can \$ 12 per GJ the royalty rate would reach 21%. For higher prices the royalty would increase only 1% for every Can \$ per GJ up to a maximum royalty rate of 30%. The royalty would stay flat at this rate under higher prices.

With respect to the gas volume of production per day per well, the royalty would be set at 0% at a price of 3 thousand m³ per day. Over this volume the royalty would increase by 3% for every thousand m³ per day. Once a production of 11 thousand m³ per day is reached the royalty would be 24%. Over this level, the royalty would continue to increase with 1% for every thousand m³ per day, until a maximum rate of 33% is reached.

The total royalty based on price and based on volume cannot exceed 45%.

Table 5A provides the summary of this proposal.

Table 5A Proposed gas royalty

PRICE SENSITIVE ROYALTY	
Price Sensitive Royalty applies	1
Base Price # 1 (Can \$/GJ)	5.00
Rate # 1 Increment per Can \$ over Base	3.00%
Base Price # 2 (Can \$/GJ)	12.00
Rate # 2 Increment per Can \$ over Base	1.00%
Max Rate	30.00%
Price inflation adjustment (yes=1)	1
PRODUCTION SENSITIVE ROYALTY	
Production Sensitive Royalty applies	1
Base # 1 Productivity (th cum/day)	3.00
Rate # 1 Increment per th cum/day	3.00%
Base # 2 Productivity (th cum/day)	11.00
Rate # 2 Increment per th cum/day	1.00%
Max Rate	33.00%
Common royalty cap	45.00%
Minimum royalty	0.00%

The reason that the increase in royalty rates needs to slow down over certain levels relates to the marginal royalty rate. If the royalty rates increase for ever higher prices or volumes on a linear basis, the combined incremental effect becomes rather strong.

This is illustrated in Table 5B, which provides the royalty rate scale as well as the calculation of the marginal rate. For instance, at Can \$ 11 per GJ, the royalty rate is 18% and the royalty is therefore Can \$ 1.98 out of the total price of Can \$ 11. At Can \$ 12 per GJ, the royalty rate is 21% and the royalty is therefore Can \$ 2.52 out of the total price of Can \$ 12 per GJ. In other words a one dollar increase between these two levels results in a higher royalty of Can \$ 0.54 per dollar increase or 54%. If the linear function is allowed to continue the marginal rates could exceed 100%.

Obviously, it does not make sense to have gas producers being interested in lower gas prices in order to avoid excessive marginal royalties. If the marginal rate does not exceed very much the 50%, a gas producer will always have an interest in higher gas prices.

Charts 5.1 and Charts 5.2 illustrate the royalty rates and marginal royalty rates based on price.

The tables and charts show negative royalties. This is intended. This is being used to create a progressive system for the integration to the total royalty level.

Table 5B Gas royalty based on price

PRICE Henry Hub Can\$/GJ	Royalty Rate	Multipli- cation	Marginal Royalty Rate
0	-15.00%	0.0000	0.0%
1	-12.00%	-0.1200	-12.0%
2	-9.00%	-0.1800	-6.0%
3	-6.00%	-0.1800	0.0%
4	-3.00%	-0.1200	6.0%
5	0.00%	0.0000	12.0%
6	3.00%	0.1800	18.0%
7	6.00%	0.4200	24.0%
8	9.00%	0.7200	30.0%
9	12.00%	1.0800	36.0%
10	15.00%	1.5000	42.0%
11	18.00%	1.9800	48.0%
12	21.00%	2.5200	54.0%
13	22.00%	2.8600	34.0%
14	23.00%	3.2200	36.0%
15	24.00%	3.6000	38.0%
16	25.00%	4.0000	40.0%
17	26.00%	4.4200	42.0%
18	27.00%	4.8600	44.0%
19	28.00%	5.3200	46.0%
20	29.00%	5.8000	48.0%
21	30.00%	6.3000	50.0%
22	30.00%	6.6000	30.0%
23	30.00%	6.9000	30.0%
24	30.00%	7.2000	30.0%
25	30.00%	7.5000	30.0%

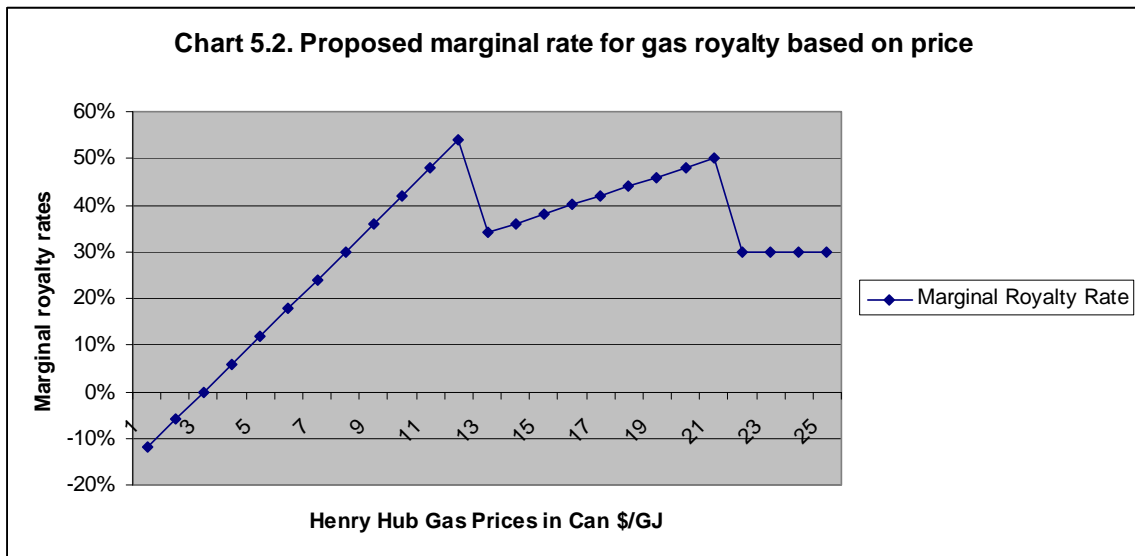
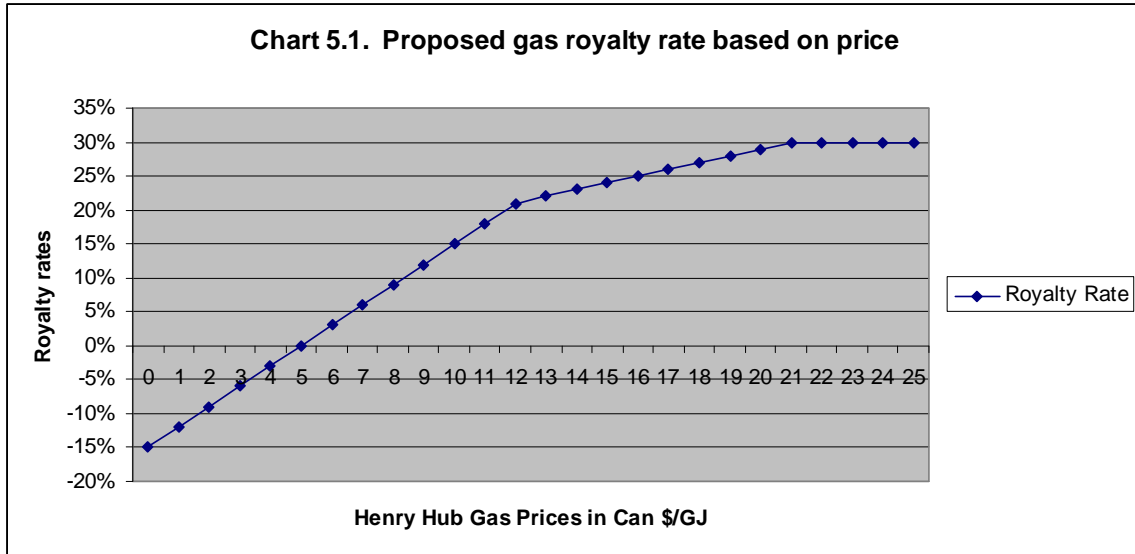


Table 5C provides the same overview for the gas royalty rates based on volume.

As can be seen between 10 and 11 thousand m³ per day per well, the marginal royalty rate reached 54%. It is therefore, that after 11 thousand m³ per day per well the increases are reduced to 1% per thousand m³ per day.

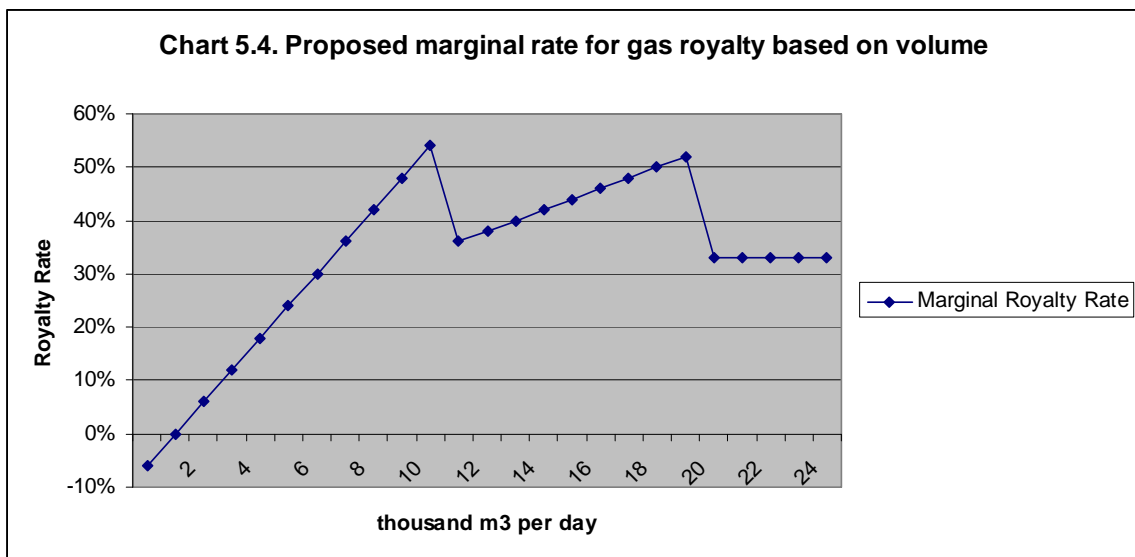
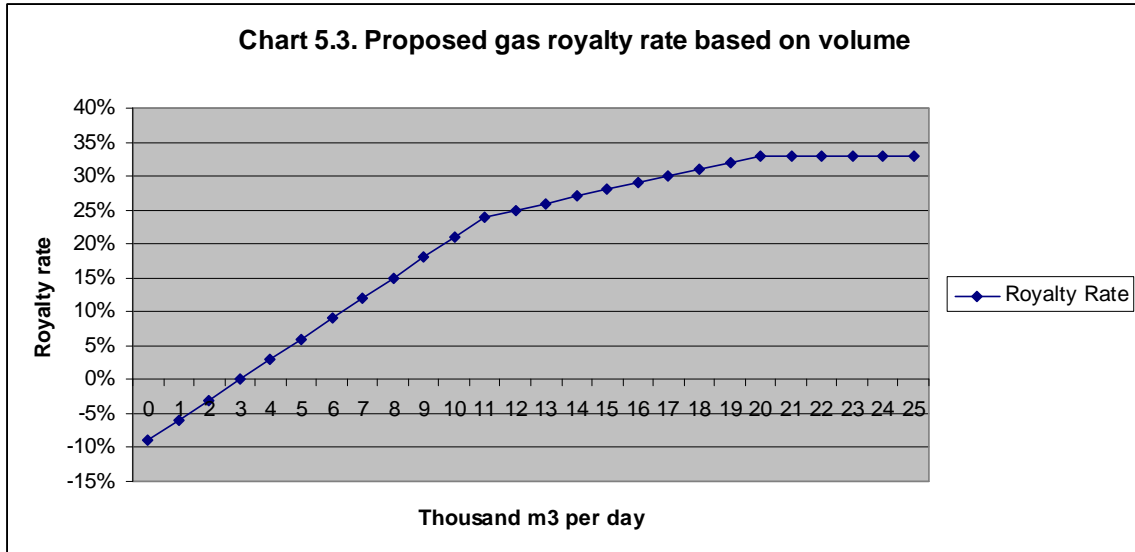
In this way, a producer will always have an interest in producing a well at the highest permitted level of production.

Charts 5.3 and 5.4 illustrate the royalty rate and marginal royalty rate based on volume.

Also in this case the table and charts show negative royalties.

Table 5C Gas royalty based on quantity

VOLUME th m3/day	Royalty Rate	Multipli- cation	Marginal Royalty Rate
0	-9.0%	0.0000	0.0%
1	-6.0%	-0.0600	-6.0%
2	-3.0%	-0.0600	0.0%
3	0.0%	0.0000	6.0%
4	3.0%	0.1200	12.0%
5	6.0%	0.3000	18.0%
6	9.0%	0.5400	24.0%
7	12.0%	0.8400	30.0%
8	15.0%	1.2000	36.0%
9	18.0%	1.6200	42.0%
10	21.0%	2.1000	48.0%
11	24.0%	2.6400	54.0%
12	25.0%	3.0000	36.0%
13	26.0%	3.3800	38.0%
14	27.0%	3.7800	40.0%
15	28.0%	4.2000	42.0%
16	29.0%	4.6400	44.0%
17	30.0%	5.1000	46.0%
18	31.0%	5.5800	48.0%
19	32.0%	6.0800	50.0%
20	33.0%	6.6000	52.0%
21	33.0%	6.9300	33.0%
22	33.0%	7.2600	33.0%
23	33.0%	7.5900	33.0%
24	33.0%	7.9200	33.0%
25	33.0%	8.2500	33.0%



The negative royalties for either price or volume will be used in the summation for the total royalty. Table 5D provides a calculation example.

If both the royalties are negative, the royalty will be set at 0%, of course.

Table 5D Example of integration

Gas price:	Can \$ 4.70 per GJ
Gas royalty based on price:	-0.90%
Volume:	4.1 thousand m3 per day
Gas royalty based on volume:	3.30%
Total royalty:	2.60%

In the example the gas price is below the base price of Can \$ 5.00 per GJ. Therefore, the royalty is negative, at – 0.90%. However, the volume is over the base volume and the royalty based on volume is positive, at 3.30%. The total royalty is therefore 2.60%.

Proposed Oil Royalty

The proposed oil royalty works in exactly the same way as the gas royalty. The base price for oil is Can \$ 300 per m3. The base volume is 3 m3 per day.

Over these levels the royalty based on price and volume increase up to the point where the marginal royalty rates become too high and after that the royalties increase at a slower rate.

The following table provides the overview of the proposed oil royalty.

Table 5E Proposed oil royalty

PRICE SENSITIVE ROYALTY OIL

Price Sensitive Royalty applies	1
Base # 1 Price (Can \$/m3)	300.00
Rate # 1 Increment per Can \$/m3 over Base	0.050%
Base # 2 Price (Can \$/m3)	700.00
Rate #2 Increment per Can \$/m3 over Base	0.020%
Max Rate	30.00%
Price inflation adjusted(yes=1)	1

PRODUCTION SENSITIVE ROYALTY OIL

Base # 1 Productivity (m3/day)	3.00
Rate # 1 Increment per m3/day	3.00%
Base # 2 Productivity (m3/day)	11.00
Rate # 2 Increment per m3/day	1.00%
Max Rate	33.00%

Common royalty cap	45.00%
Minimum royalty	0.00%

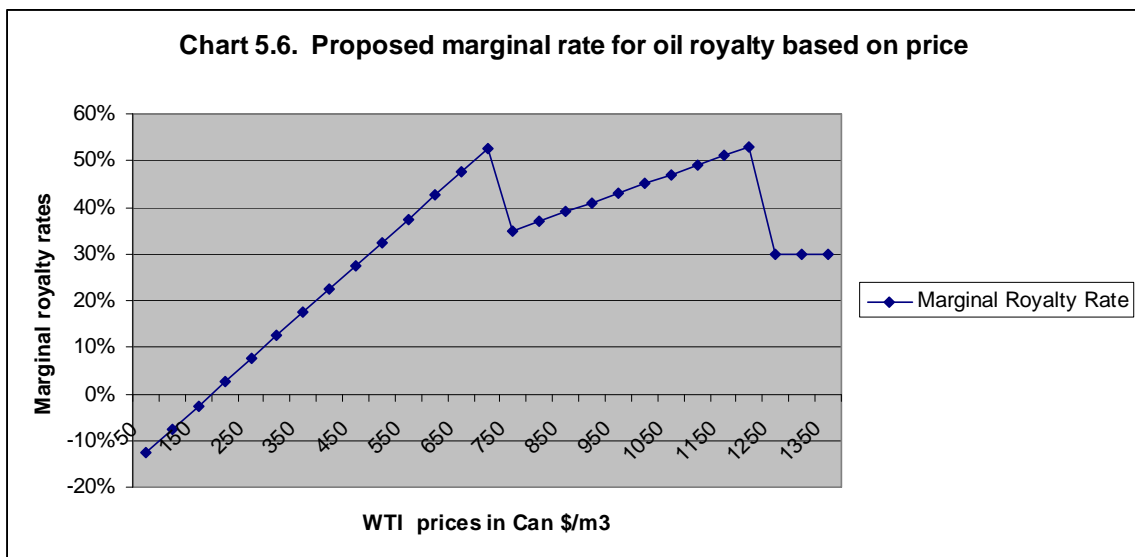
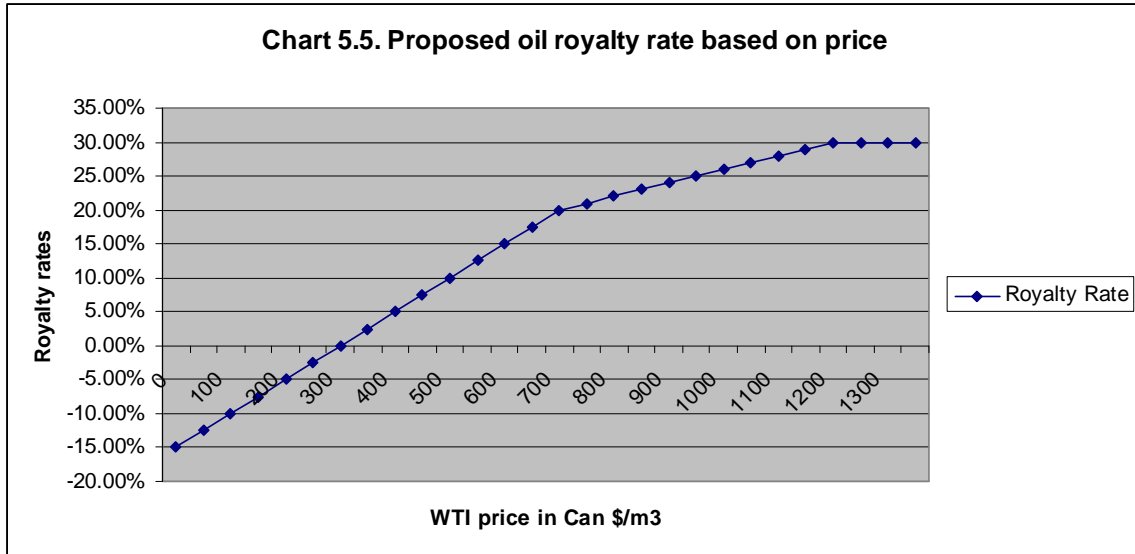
The following table identifies the marginal oil royalty rate based on price and the charts 5.5 and 5.6 provide the royalty rate and marginal rate.

Table 5F Oil royalty based on price

PRICE WTI Can\$/m3	Royalty Rate	Multipli- cation	Marginal Royalty Rate
0	-15.00%	0.0000	0.0%
50	-12.50%	-6.2500	-12.5%
100	-10.00%	-10.0000	-7.5%
150	-7.50%	-11.2500	-2.5%
200	-5.00%	-10.0000	2.5%
250	-2.50%	-6.2500	7.5%
300	0.00%	0.0000	12.5%
350	2.50%	8.7500	17.5%
400	5.00%	20.0000	22.5%
450	7.50%	33.7500	27.5%
500	10.00%	50.0000	32.5%
550	12.50%	68.7500	37.5%
600	15.00%	90.0000	42.5%
650	17.50%	113.7500	47.5%
700	20.00%	140.0000	52.5%
750	21.00%	157.5000	35.0%
800	22.00%	176.0000	37.0%
850	23.00%	195.5000	39.0%
900	24.00%	216.0000	41.0%
950	25.00%	237.5000	43.0%
1000	26.00%	260.0000	45.0%
1050	27.00%	283.5000	47.0%
1100	28.00%	308.0000	49.0%
1150	29.00%	333.5000	51.0%
1200	30.00%	360.0000	53.0%
1250	30.00%	375.0000	30.0%
1300	30.00%	390.0000	30.0%
1350	30.00%	405.0000	30.0%

Table 5F Gas royalty based on price

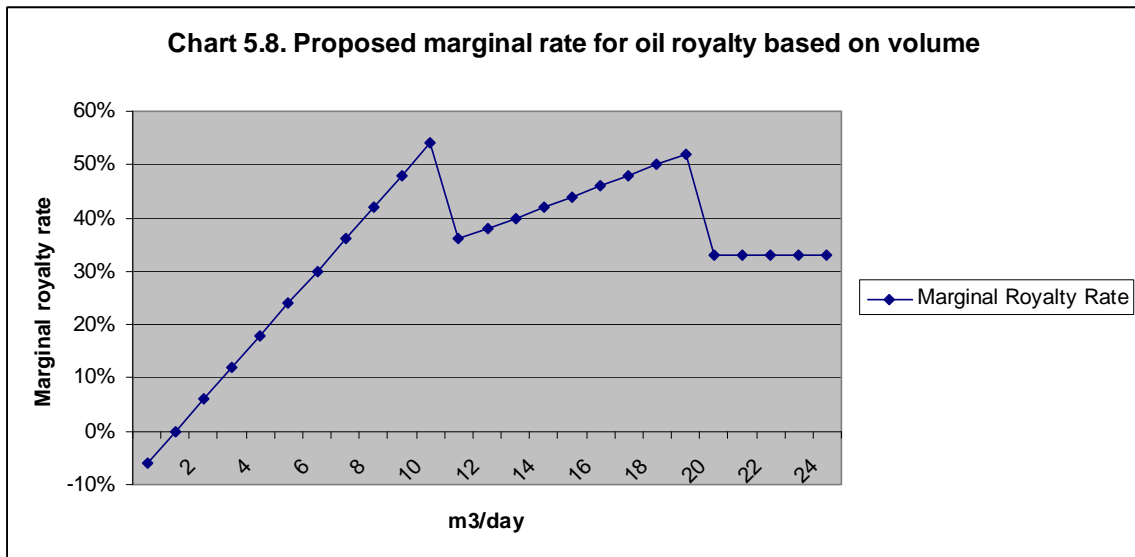
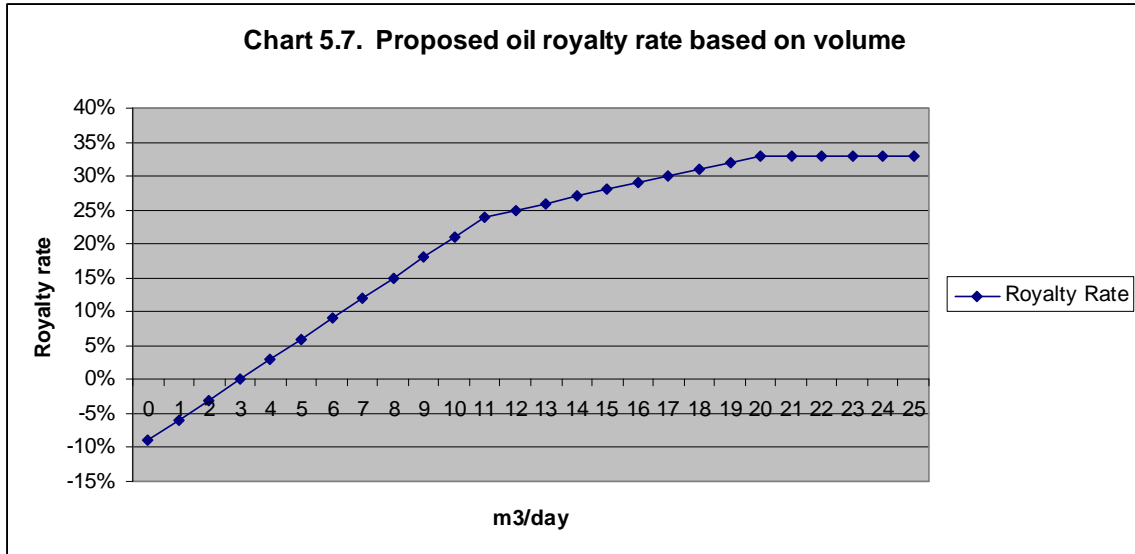
PRICE WTI Can\$/m3	Royalty Rate	Multipli- cation	Marginal Royalty Rate
0	-15.00%	0.0000	0.0%
50	-12.50%	-6.2500	-12.5%
100	-10.00%	-10.0000	-7.5%
150	-7.50%	-11.2500	-2.5%
200	-5.00%	-10.0000	2.5%
250	-2.50%	-6.2500	7.5%
300	0.00%	0.0000	12.5%
350	2.50%	8.7500	17.5%
400	5.00%	20.0000	22.5%
450	7.50%	33.7500	27.5%
500	10.00%	50.0000	32.5%
550	12.50%	68.7500	37.5%
600	15.00%	90.0000	42.5%
650	17.50%	113.7500	47.5%
700	20.00%	140.0000	52.5%
750	21.00%	157.5000	35.0%
800	22.00%	176.0000	37.0%
850	23.00%	195.5000	39.0%
900	24.00%	216.0000	41.0%
950	25.00%	237.5000	43.0%
1000	26.00%	260.0000	45.0%
1050	27.00%	283.5000	47.0%
1100	28.00%	308.0000	49.0%
1150	29.00%	333.5000	51.0%
1200	30.00%	360.0000	53.0%
1250	30.00%	375.0000	30.0%
1300	30.00%	390.0000	30.0%
1350	30.00%	405.0000	30.0%



The following table and Charts 5.7 and 5.8 provide the overview of the oil royalty based on volume.

Table 5G Oil royalty based on quantity

VOLUME m3/day	Royalty Rate	Multipli- cation	Marginal Royalty Rate
0	-9.0%	0.0000	0.0%
1	-6.0%	-0.0600	-6.0%
2	-3.0%	-0.0600	0.0%
3	0.0%	0.0000	6.0%
4	3.0%	0.1200	12.0%
5	6.0%	0.3000	18.0%
6	9.0%	0.5400	24.0%
7	12.0%	0.8400	30.0%
8	15.0%	1.2000	36.0%
9	18.0%	1.6200	42.0%
10	21.0%	2.1000	48.0%
11	24.0%	2.6400	54.0%
12	25.0%	3.0000	36.0%
13	26.0%	3.3800	38.0%
14	27.0%	3.7800	40.0%
15	28.0%	4.2000	42.0%
16	29.0%	4.6400	44.0%
17	30.0%	5.1000	46.0%
18	31.0%	5.5800	48.0%
19	32.0%	6.0800	50.0%
20	33.0%	6.6000	52.0%
21	33.0%	6.9300	33.0%
22	33.0%	7.2600	33.0%
23	33.0%	7.5900	33.0%
24	33.0%	7.9200	33.0%
25	33.0%	8.2500	33.0%



Following table is an example calculation.

Table 5H Example of integration

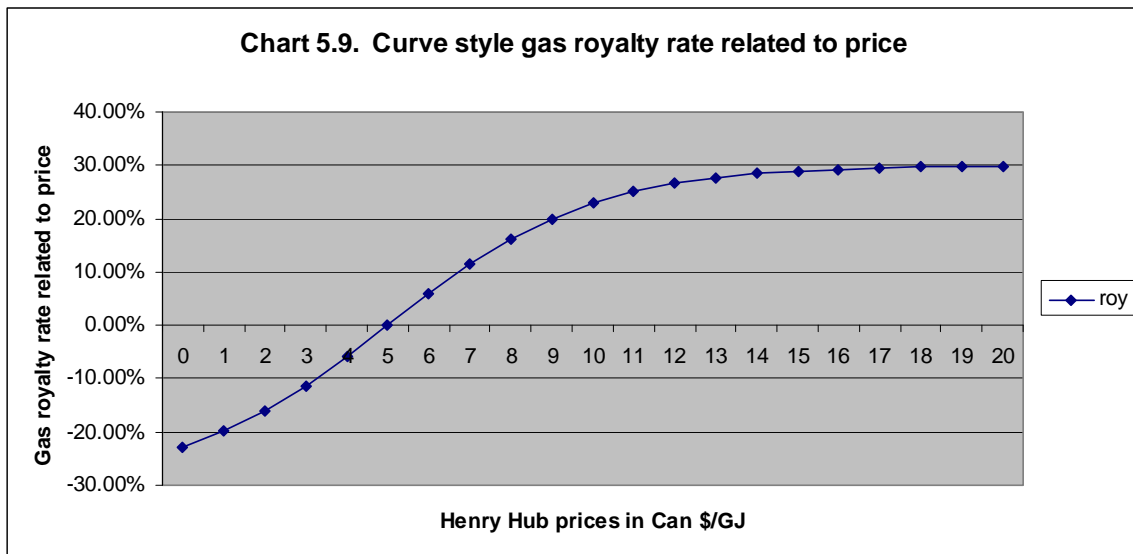
Oil price	Can \$ 350 per m3
Oil royalty based on price:	2.50%
Volume:	2.5 m3 per day
Gas royalty based on volume:	-1.50%
Total royalty:	1.00%

Marginal Rates

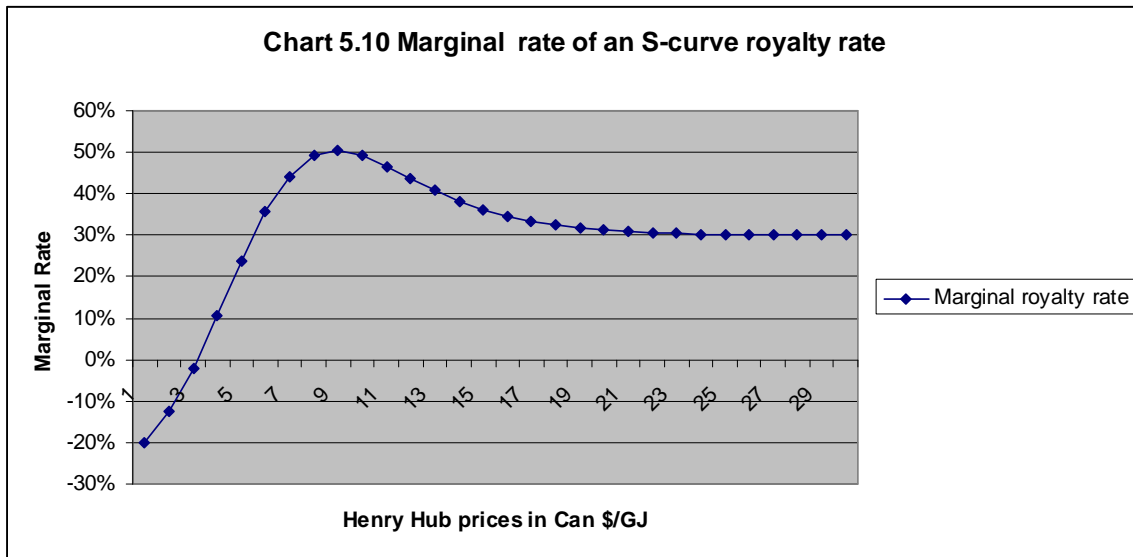
From the marginal royalty rate graphs, it is obvious that this rates seesaws at the base price points and at the maximum rate. In the current Alberta formula's an effort is made to smooth these functions out in order to make the changes more gradual. This is pleasing from a conceptual point of view, but has no important practical implication. The result is that the formula's become far more complex than they need to be.

It is possible to make a gas and an oil royalty formula for price and volume based on more gradual curves.

For instance Chart 5.9 provides such a possible curve for the gas royalty related to price.



The marginal royalty rate is displayed in Chart 5.10.



The formula required in order to generate the curve of Chart 5.9 would be as follows:

$$F = 0.4 * P - 2.00$$

$$\text{Roy\%} = (60 / (1 + e^F) - 2) / 100 - 28$$

in which:

F is an exponent number

P is the Henry Hub price in Can \$ per GJ

e is the mathematical value e

The advantage of the curved royalty rate is that is more pleasing esthetically. The main disadvantage is that the formula is difficult to understand for the average accounting professional having to work with the royalty formula. The linear formula would be much easier to understand for the investors, who often like to understand the royalty “on the back of an envelope” in order to make investment decisions.

There is no inherent commercial advantage of the nice smooth marginal rate curve of Chart 5.10 versus the seesaw graph of Chart 5.2. The two curves will not result in a different behavior by investors or producers.

Introduction of the Proposed Royalties

The gas royalty to be proposed is designed to replace the New Gas and Old Gas terms. The idea is to simplify the gas royalty system.

The oil royalty to be proposed is designed to replace the Third Tier, New Oil and Old Oil terms.

It cannot be recommended to create another “tier” and grandfather the current terms. The current terms are clearly outdated and no longer in the interest of Alberta.

Obviously, there will be a change in royalty terms for every well in Alberta, after these wells have been drilled and are in production. Such a change of existing terms will be perceived as a reduction of fiscal stability. However, it should be noted that such changes in existing terms do occur regularly in many countries in the world.

Alberta certainly is perceived in general as a politically low risk and stable environment. A one time reasonable change will not alter this perspective and will therefore not be damaging for the long term investment in the province. Similar changes have occurred in other OECD jurisdictions, such as the UK, Alaska or the US Federal Government without loss of investor confidence.

5.2. Analysis of proposed gas terms

Following is an analysis of the proposed gas royalty that would replace the New Gas and Old Gas.

In making this comparison, we will use the same tables of Chapter 4 and will compare only with Texas.

For convenience and comparison with oil terms, all values in the maps are converted to BOE values.

Note: It should be noted that we use the same table numbers as in Chapter 4 in order to identify the Chapter 4 maps in this Chapter 5. New tables will be numbered as Chapter 5 tables. As in Chapter 4, the table numbers are not sequential.

Gross Revenues per BOE

Following are the maps for the gross revenues per BOE netted back to the wells.

These revenues are assumed to be the same for Alberta-New, Alberta-Old and the Alberta Proposed terms.

Table 4.001 **ALBERTA-NEW** **GAS WELL**
Gross Rev (Can \$) per BOE
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$20.07	\$20.07
5	\$26.89	\$26.89	\$26.89	\$26.89	\$26.89	\$26.89	\$26.89
6	\$33.71	\$33.71	\$33.71	\$33.71	\$33.71	\$33.71	\$33.71
7	\$40.53	\$40.53	\$40.53	\$40.53	\$40.53	\$40.53	\$40.53
8	\$47.35	\$47.35	\$47.35	\$47.35	\$47.35	\$47.35	\$47.35
9	\$54.16	\$54.16	\$54.16	\$54.16	\$54.16	\$54.16	\$54.16
10	\$60.98	\$60.98	\$60.98	\$60.98	\$60.98	\$60.98	\$60.98
11	\$67.80	\$67.80	\$67.80	\$67.80	\$67.80	\$67.80	\$67.80

Table 4.021 **TEXAS** **GAS WELL**
Gross Revenues (\$ Cdn) per Mcf
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$19.25
4					\$26.07	\$26.07	\$26.07
5		\$32.89	\$32.89	\$32.89	\$32.89	\$32.89	\$32.89
6	\$39.71	\$39.71	\$39.71	\$39.71	\$39.71	\$39.71	\$39.71
7	\$46.53	\$46.53	\$46.53	\$46.53	\$46.53	\$46.53	\$46.53
8	\$53.35	\$53.35	\$53.35	\$53.35	\$53.35	\$53.35	\$53.35
9	\$60.16	\$60.16	\$60.16	\$60.16	\$60.16	\$60.16	\$60.16
10	\$66.98	\$66.98	\$66.98	\$66.98	\$66.98	\$66.98	\$66.98
11	\$73.80	\$73.80	\$73.80	\$73.80	\$73.80	\$73.80	\$73.80

As can be expected, Texas has higher Gross Revenues per BOE, since net back values were assumed to be higher in Texas.

Total Costs per BOE

The total costs per BOE are the same for all cases and the following map therefore illustrates these costs per BOE.

Table 4.002 ALBERTA-NEW GAS WELL
Total expenditures (\$ Cdn) per Mcf
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$12.27	\$10.13
5	\$21.48	\$19.85	\$18.14	\$16.30	\$14.26	\$12.27	\$10.13
6	\$21.48	\$19.85	\$18.14	\$16.30	\$14.26	\$12.27	\$10.13
7	\$21.48	\$19.85	\$18.14	\$16.30	\$14.26	\$12.27	\$10.13
8	\$21.48	\$19.85	\$18.14	\$16.30	\$14.26	\$12.27	\$10.13
9	\$21.48	\$19.85	\$18.14	\$16.30	\$14.26	\$12.27	\$10.13
10	\$22.34	\$19.85	\$18.14	\$16.30	\$14.26	\$12.27	\$10.13
11	\$22.34	\$19.85	\$18.14	\$16.30	\$14.26	\$12.27	\$10.13

Divisible Income per BOE

The following charts display the divisible income per BOE in Alberta and Texas.

Table 4.003 ALBERTA-NEW GAS WELL
Divisible Income (\$ Cdn) per BOE
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$7.80	\$9.94
5	\$5.41	\$7.04	\$8.75	\$10.59	\$12.63	\$14.62	\$16.76
6	\$12.22	\$13.86	\$15.57	\$17.41	\$19.45	\$21.44	\$23.58
7	\$19.04	\$20.68	\$22.39	\$24.23	\$26.27	\$28.25	\$30.40
8	\$25.86	\$27.50	\$29.21	\$31.05	\$33.08	\$35.07	\$37.21
9	\$32.68	\$34.31	\$36.03	\$37.86	\$39.90	\$41.89	\$44.03
10	\$38.64	\$41.13	\$42.84	\$44.68	\$46.72	\$48.71	\$50.85
11	\$45.46	\$47.95	\$49.66	\$51.50	\$53.54	\$55.53	\$57.67

Table 4.023 TEXAS GAS WELL
Divisible Income (\$ Cdn) per BOE
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$9.12
4					\$11.96	\$13.80	\$15.94
5		\$13.04	\$14.75	\$16.59	\$18.77	\$20.62	\$22.76
6	\$18.22	\$19.86	\$21.57	\$23.41	\$25.59	\$27.44	\$29.58
7	\$25.04	\$26.68	\$28.39	\$30.23	\$32.41	\$34.25	\$36.40
8	\$31.86	\$33.50	\$35.21	\$37.05	\$39.23	\$41.07	\$43.21
9	\$38.68	\$40.31	\$42.03	\$43.86	\$46.05	\$47.89	\$50.03
10	\$45.50	\$47.13	\$48.84	\$50.68	\$52.87	\$54.71	\$56.85
11	\$52.32	\$53.95	\$55.66	\$57.50	\$59.68	\$61.53	\$63.67

As can be expected, the divisible income in Texas is higher.

Government Revenues per BOE

Following four maps provide the government revenues per BOE. In the case of Texas this also includes the royalty revenues of the private land owner.

Table 4.004 ALBERTA-NEW GAS WELL
Government Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$6.30	\$7.04
5	\$3.86	\$5.26	\$6.47	\$7.77	\$8.93	\$9.79	\$10.56
6	\$6.46	\$8.10	\$9.49	\$10.98	\$12.27	\$13.20	\$14.00
7	\$9.06	\$10.93	\$12.50	\$14.18	\$15.61	\$16.61	\$17.44
8	\$11.66	\$13.77	\$15.51	\$17.38	\$18.95	\$20.02	\$20.89
9	\$14.26	\$16.60	\$18.52	\$20.59	\$22.29	\$23.43	\$24.33
10	\$16.54	\$19.44	\$21.53	\$23.79	\$25.63	\$26.83	\$27.77
11	\$19.14	\$22.27	\$24.55	\$26.99	\$28.97	\$30.24	\$31.22

Table 4.014 ALBERTA-OLD GAS WELL
Government Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$7.04	\$7.80
5	\$4.11	\$5.70	\$7.05	\$8.50	\$9.76	\$10.68	\$11.47
6	\$6.77	\$8.64	\$10.21	\$11.89	\$13.31	\$14.31	\$15.15
7	\$9.44	\$11.59	\$13.36	\$15.27	\$16.87	\$17.94	\$18.82
8	\$12.10	\$14.53	\$16.52	\$18.66	\$20.42	\$21.58	\$22.50
9	\$14.77	\$17.48	\$19.68	\$22.04	\$23.97	\$25.21	\$26.17
10	\$17.10	\$20.42	\$22.84	\$25.43	\$27.52	\$28.85	\$29.85
11	\$19.75	\$23.37	\$25.99	\$28.82	\$31.08	\$32.48	\$33.52

Table 5.004 ALBERTA-PROPOSED GAS WELL
Government Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$6.32	\$7.18
5	\$1.92	\$3.53	\$5.21	\$7.21	\$9.05	\$10.26	\$11.20
6	\$4.45	\$6.49	\$8.51	\$10.92	\$13.10	\$14.47	\$15.50
7	\$7.35	\$9.78	\$12.13	\$14.94	\$17.45	\$18.99	\$20.09
8	\$10.64	\$13.41	\$16.07	\$19.25	\$22.09	\$23.79	\$24.97
9	\$14.21	\$17.32	\$20.29	\$23.85	\$26.85	\$28.59	\$29.78
10	\$17.76	\$21.51	\$24.80	\$28.36	\$31.22	\$32.88	\$34.02
11	\$21.89	\$25.98	\$29.58	\$33.04	\$35.65	\$37.19	\$38.27

Table 4.024 TEXAS GAS WELL
Government & Private Income + Participation per Mcf (\$ Cdn)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							\$7.52
4					\$10.00	\$10.61	\$11.24
5		\$11.81	\$12.40	\$13.01	\$13.73	\$14.34	\$14.97
6	\$14.89	\$15.53	\$16.13	\$16.74	\$17.46	\$18.06	\$18.70
7	\$18.62	\$19.26	\$19.85	\$20.46	\$21.18	\$21.79	\$22.43
8	\$22.35	\$22.99	\$23.58	\$24.19	\$24.91	\$25.52	\$26.15
9	\$26.08	\$26.72	\$27.31	\$27.92	\$28.64	\$29.25	\$29.88
10	\$29.80	\$30.44	\$31.04	\$31.65	\$32.37	\$32.97	\$33.61
11	\$33.53	\$34.17	\$34.76	\$35.37	\$36.09	\$36.70	\$37.34

The Alberta-Proposed system results in much higher income under high prices and lower income for low productivity wells compared to Alberta-New and Alberta-Old.

Texas gross revenues per BOE are much higher for marginal wells. However, it is likely that as a result much less of these wells will be drilled unless royalty owners agree to lower the royalties.

Royalties per BOE

For the three Alberta cases the royalties per BOE are provided below. The maps are not color coded since they are introductory maps for the royalty rate maps.

Table 5.011		ALBERTA-NEW			GAS WELL			
Royalties per BOE								
HENRY HUB								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3		\$1.33	\$1.83	\$2.20	\$2.60	\$2.89	\$3.04	\$3.11
4		\$2.31	\$3.27	\$4.00	\$4.78	\$5.35	\$5.63	\$5.77
5		\$3.13	\$4.45	\$5.45	\$6.52	\$7.30	\$7.69	\$7.88
6		\$3.93	\$5.58	\$6.83	\$8.17	\$9.15	\$9.63	\$9.87
7		\$4.72	\$6.70	\$8.21	\$9.83	\$11.00	\$11.58	\$11.87
8		\$5.52	\$7.83	\$9.59	\$11.48	\$12.85	\$13.53	\$13.87
9		\$6.31	\$8.96	\$10.97	\$13.13	\$14.70	\$15.48	\$15.86
10		\$7.01	\$10.09	\$12.35	\$14.79	\$16.56	\$17.43	\$17.86
11		\$7.80	\$11.21	\$13.73	\$16.44	\$18.41	\$19.38	\$19.86

Table 5.012		ALBERTA-NEW			GAS WELL			
Royalties per BOE								
HENRY HUB								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3		\$1.72	\$2.50	\$3.09	\$3.72	\$4.19	\$4.41	\$4.53
4		\$2.61	\$3.78	\$4.68	\$5.64	\$6.34	\$6.68	\$6.85
5		\$3.49	\$5.07	\$6.27	\$7.56	\$8.49	\$8.95	\$9.18
6		\$4.38	\$6.35	\$7.86	\$9.47	\$10.64	\$11.22	\$11.51
7		\$5.26	\$7.64	\$9.45	\$11.39	\$12.80	\$13.49	\$13.84
8		\$6.15	\$8.92	\$11.03	\$13.30	\$14.95	\$15.76	\$16.17
9		\$7.03	\$10.21	\$12.62	\$15.22	\$17.10	\$18.03	\$18.50
10		\$7.81	\$11.49	\$14.21	\$17.14	\$19.26	\$20.30	\$20.82
11		\$8.68	\$12.78	\$15.80	\$19.05	\$21.41	\$22.57	\$23.15

Table 5.013		ALBERTA-PROPOSED			GAS WELL			
Royalties per BOE								
HENRY HUB								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3		\$0.00	\$0.25	\$0.87	\$1.73	\$2.48	\$2.85	\$3.03
4		\$0.00	\$0.69	\$1.76	\$3.17	\$4.39	\$4.99	\$5.29
5		\$0.10	\$1.45	\$3.03	\$5.04	\$6.76	\$7.61	\$8.03
6		\$0.59	\$2.65	\$4.76	\$7.37	\$9.60	\$10.70	\$11.25
7		\$1.66	\$4.40	\$7.02	\$10.23	\$12.95	\$14.30	\$14.97
8		\$3.54	\$6.80	\$9.88	\$13.64	\$16.83	\$18.40	\$19.19
9		\$5.97	\$9.71	\$13.23	\$17.54	\$21.11	\$22.81	\$23.62
10		\$8.81	\$13.11	\$17.08	\$21.37	\$24.57	\$26.08	\$26.80
11		\$12.21	\$16.99	\$21.40	\$25.32	\$28.07	\$29.36	\$29.97

The maps illustrate how under high gas prices the Alberta-proposed system results in much higher royalties per BOE than Alberta-New and Alberta-Old. For marginal wells the Alberta-Proposed has much lower royalties at low prices.

Royalty rates

Following three maps provide the actual royalty rates under the Alberta New and Old systems and the proposed system.

Table 5.014 **ALBERTA-NEW** **GAS WELL**
Royalty rate
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3	10.06%	13.77%	16.60%	19.64%	21.84%	22.93%	23.47%
4	11.50%	16.28%	19.91%	23.82%	26.65%	28.05%	28.75%
5	11.65%	16.54%	20.25%	24.25%	27.15%	28.58%	29.29%
6	11.65%	16.54%	20.25%	24.25%	27.15%	28.58%	29.29%
7	11.65%	16.54%	20.25%	24.25%	27.15%	28.58%	29.29%
8	11.65%	16.54%	20.25%	24.25%	27.15%	28.58%	29.29%
9	11.65%	16.54%	20.25%	24.25%	27.15%	28.58%	29.29%
10	11.50%	16.54%	20.25%	24.25%	27.15%	28.58%	29.29%
11	11.50%	16.54%	20.25%	24.25%	27.15%	28.58%	29.29%

Table 5.015 **ALBERTA-OLD** **GAS WELL**
Royalty rate
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3	12.98%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
4	12.98%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
5	12.98%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
6	12.98%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
7	12.98%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
8	12.98%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
9	12.98%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
10	12.80%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%
11	12.80%	18.85%	23.31%	28.10%	31.58%	33.29%	34.15%

Table 5.016 **ALBERTA-PROPOSED** **GAS WELL**
Royalty rate
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3	0.00%	1.85%	6.53%	13.07%	18.73%	21.51%	22.89%
4	0.00%	3.42%	8.79%	15.79%	21.87%	24.87%	26.36%
5	0.37%	5.38%	11.29%	18.74%	25.12%	28.28%	29.86%
6	1.74%	7.87%	14.13%	21.88%	28.48%	31.75%	33.38%
7	4.10%	10.86%	17.32%	25.25%	31.96%	35.29%	36.95%
8	7.49%	14.37%	20.86%	28.82%	35.54%	38.87%	40.53%
9	11.03%	17.93%	24.43%	32.39%	38.97%	42.10%	43.61%
10	14.45%	21.49%	28.00%	35.04%	40.29%	42.76%	43.94%
11	18.00%	25.05%	31.57%	37.35%	41.40%	43.31%	44.20%

It can be clearly seen how the current systems no longer provide for royalties that increase with higher prices, as was the original concept of the changes in 1974. Except for very low prices, the royalties are constant.

The Alberta-Proposed terms show a system that has strongly increasing royalties will price and volume. Also the Alberta-Proposed system has very low royalty rates for the truly marginal wells.

Table 5.017 shows the average difference in royalty rates. The weighted average is calculated by using 90% of New Gas and 10% of Old Gas.

Table 5.017 **ALBERTA-PROPOSED** **GAS WELL**
Royalty differential-weighted average
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3	-10.35%	-12.43%	-10.74%	-7.41%	-4.09%	-2.46%	-1.65%
4	-11.65%	-13.12%	-11.46%	-8.46%	-5.27%	-3.70%	-2.93%
5	-11.41%	-11.39%	-9.27%	-5.89%	-2.47%	-0.77%	0.08%
6	-10.04%	-8.90%	-6.43%	-2.76%	0.88%	2.70%	3.61%
7	-7.68%	-5.91%	-3.24%	0.62%	4.37%	6.23%	7.17%
8	-4.30%	-2.40%	0.30%	4.18%	7.95%	9.82%	10.76%
9	-0.76%	1.16%	3.87%	7.75%	11.37%	13.05%	13.83%
10	2.82%	4.72%	7.44%	10.41%	12.69%	13.71%	14.16%
11	6.37%	8.28%	11.01%	12.72%	13.81%	14.26%	14.43%

This map shows how there is a reduction of all gas royalties under low prices. Under low volumes there is also a reduction with volume and therefore existing producers and new investors in marginal wells will experience a significant reduction of royalties under low prices. The Proposed system will be a strong encouragement for the drilling of low productivity gas wells.

Higher royalties are paid when prices are higher and for the truly productive wells. Significantly higher royalties are paid under very high prices and very productive wells.

At the current price level of about US \$ 6 to US \$ 7 Henry Hub, producers of marginal wells will experience a reduction in royalties and producers of productive wells will experience an increase.

The following two maps make the comparison between the proposed system and the New Gas and Old Gas terms separately.

Table 5.018 ALBERTA-PROPOSED GAS WELL
Royalty differential - New Gas
HENRY HUB
US \$

3	-10.06%	-11.92%	-10.07%	-6.56%	-3.11%	-1.42%	-0.58%
4	-11.50%	-12.86%	-11.12%	-8.03%	-4.78%	-3.18%	-2.39%
5	-11.28%	-11.16%	-8.97%	-5.51%	-2.02%	-0.30%	0.57%
6	-9.91%	-8.67%	-6.13%	-2.37%	1.33%	3.17%	4.09%
7	-7.55%	-5.68%	-2.93%	1.00%	4.81%	6.71%	7.66%
8	-4.17%	-2.17%	0.61%	4.57%	8.39%	10.29%	11.24%
9	-0.62%	1.39%	4.18%	8.14%	11.82%	13.53%	14.32%
10	2.95%	4.95%	7.75%	10.79%	13.14%	14.18%	14.65%
11	6.50%	8.51%	11.31%	13.10%	14.25%	14.73%	14.91%

Table 5.019 ALBERTA-PROPOSED GAS WELL
Royalty differential-Old Gas
HENRY HUB
US \$

3	-12.98%	-16.99%	-16.78%	-15.03%	-12.85%	-11.79%	-11.26%
4	-12.98%	-15.43%	-14.52%	-12.31%	-9.71%	-8.42%	-7.79%
5	-12.61%	-13.46%	-12.02%	-9.36%	-6.45%	-5.01%	-4.29%
6	-11.24%	-10.97%	-9.18%	-6.22%	-3.10%	-1.55%	-0.77%
7	-8.88%	-7.98%	-5.98%	-2.85%	0.38%	1.99%	2.80%
8	-5.50%	-4.48%	-2.44%	0.72%	3.96%	5.57%	6.38%
9	-1.95%	-0.92%	1.13%	4.29%	7.39%	8.81%	9.46%
10	1.65%	2.64%	4.69%	6.94%	8.71%	9.47%	9.79%
11	5.20%	6.20%	8.26%	9.25%	9.82%	10.01%	10.06%

Undiscounted Government Take

Following are the undiscounted government take maps.

Table 4.006 ALBERTA-NEW GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						80.81%	70.80%
5	71.35%	74.76%	73.97%	73.40%	70.68%	66.95%	63.00%
6	52.83%	58.44%	60.92%	63.05%	63.08%	61.56%	59.38%
7	47.58%	52.88%	55.82%	58.53%	59.43%	58.77%	57.39%
8	45.09%	50.08%	53.10%	55.99%	57.28%	57.07%	56.13%
9	43.65%	48.39%	51.42%	54.37%	55.86%	55.92%	55.26%
10	42.81%	47.26%	50.26%	53.24%	54.86%	55.09%	54.62%
11	42.10%	46.45%	49.43%	52.41%	54.12%	54.47%	54.13%

Table 4.016 ALBERTA-OLD GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						90.26%	78.43%
5	75.98%	80.93%	80.53%	80.24%	77.28%	73.02%	68.45%
6	55.40%	62.37%	65.55%	68.27%	68.45%	66.75%	64.25%
7	49.56%	56.04%	59.69%	63.03%	64.21%	63.51%	61.93%
8	46.80%	52.86%	56.57%	60.10%	61.72%	61.53%	60.46%
9	45.19%	50.94%	54.63%	58.22%	60.07%	60.19%	59.44%
10	44.25%	49.65%	53.30%	56.92%	58.91%	59.22%	58.70%
11	43.46%	48.74%	52.34%	55.96%	58.04%	58.50%	58.13%

Table 5.006 ALBERTA-PROPOSED GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						75.09%	67.43%
5	32.07%	44.94%	54.68%	63.61%	67.66%	66.57%	63.63%
6	33.71%	43.68%	51.64%	59.83%	64.69%	65.05%	63.48%
7	36.33%	45.09%	52.11%	59.70%	64.62%	65.51%	64.54%
8	39.76%	47.46%	53.80%	60.86%	65.68%	66.79%	66.14%
9	42.92%	49.92%	55.81%	62.52%	67.09%	68.16%	67.59%
10	46.07%	52.40%	57.98%	63.55%	66.87%	67.52%	66.92%
11	48.89%	54.88%	60.24%	64.48%	66.75%	67.05%	66.41%

Table 4.026 TEXAS GAS WELL
Undiscounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							82.39%
4					84.37%	76.87%	70.54%
5		90.52%	84.04%	78.41%	73.50%	69.53%	65.78%
6	81.73%	78.21%	74.76%	71.49%	68.46%	65.84%	63.22%
7	74.36%	72.20%	69.94%	67.70%	65.54%	63.61%	61.62%
8	70.15%	68.63%	66.98%	65.30%	63.65%	62.13%	60.52%
9	67.42%	66.27%	64.98%	63.65%	62.31%	61.07%	59.73%
10	65.51%	64.59%	63.54%	62.44%	61.33%	60.27%	59.12%
11	64.10%	63.34%	62.46%	61.52%	60.56%	59.65%	58.64%

The proposed Alberta terms create a rather different pattern on the Undiscounted Government Take maps.

The Alberta New and Alberta Old systems were clearly price regressive. This has now been restructured into a price progressive system. Also Alberta New and Alberta Old provided for rather high government takes on marginal wells in the US \$ 5 per GJ Henry Hub range. This has now been reversed. Low productivity wells in the US \$ 5 to US \$ 7 price range now feature a low to very low government take.

At the same time when prices are in excess of US \$ 8 per GJ Henry Hub, wells in the Cost 4- Cost -1 range feature a much higher government take than either Alberta Old or New or Texas.

In the US \$ 6 – US \$ 7 range the terms are competitive with Texas. In other words under current price conditions, the government take on good wells in Texas and Alberta would be similar. Marginal wells are much better to investors in Alberta than in Texas.

5% Discounted Government Take

Following are the 5% discounted government take maps.

Table 4.007 ALBERTA-NEW GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						86.65%	73.58%
5	83.22%	85.07%	81.84%	79.33%	74.65%	69.50%	64.47%
6	56.16%	62.27%	64.55%	66.23%	65.46%	63.21%	60.40%
7	49.45%	55.23%	58.23%	60.77%	61.18%	60.02%	58.19%
8	46.41%	51.81%	54.96%	57.77%	58.70%	58.09%	56.79%
9	44.67%	49.79%	52.95%	55.88%	57.08%	56.80%	55.84%
10	43.64%	48.46%	51.60%	54.57%	55.94%	55.88%	55.14%
11	42.82%	47.51%	50.63%	53.62%	55.10%	55.18%	54.60%

Table 4.017 ALBERTA-OLD GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						97.06%	81.66%
5	88.99%	92.52%	89.47%	87.02%	81.83%	75.93%	70.14%
6	59.03%	66.67%	69.67%	71.91%	71.19%	68.64%	65.41%
7	51.61%	58.70%	62.43%	65.61%	66.22%	64.94%	62.84%
8	48.24%	54.82%	58.68%	62.15%	63.35%	62.70%	61.22%
9	46.32%	52.53%	56.39%	59.96%	61.48%	61.20%	60.10%
10	45.16%	51.01%	54.84%	58.46%	60.16%	60.13%	59.29%
11	44.25%	49.94%	53.73%	57.36%	59.18%	59.32%	58.67%

Table 5.007 ALBERTA-PROPOSED GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						81.15%	70.42%
5	35.11%	50.35%	60.75%	69.56%	72.24%	69.62%	65.42%
6	35.27%	46.53%	55.15%	63.59%	67.82%	67.26%	64.84%
7	37.64%	47.28%	54.82%	62.66%	67.14%	67.31%	65.68%
8	40.90%	49.28%	56.07%	63.37%	67.84%	68.35%	67.13%
9	43.94%	51.52%	57.81%	64.74%	69.01%	69.54%	68.48%
10	46.94%	53.84%	59.80%	65.47%	68.45%	68.65%	67.64%
11	49.69%	56.21%	61.92%	66.14%	68.06%	67.98%	67.01%

Table 4.027 TEXAS GAS WELL
5% Discounted Government Take (Income only)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							84.38%
4					87.37%	78.50%	71.30%
5		95.06%	87.29%	80.65%	74.92%	70.38%	66.22%
6	84.37%	80.49%	76.53%	72.81%	69.34%	66.39%	63.51%
7	75.98%	73.65%	71.10%	68.60%	66.17%	64.02%	61.84%
8	71.29%	69.67%	67.84%	65.98%	64.13%	62.44%	60.69%
9	68.29%	67.07%	65.66%	64.19%	62.70%	61.32%	59.87%
10	66.20%	65.24%	64.09%	62.89%	61.65%	60.48%	59.24%
11	64.67%	63.88%	62.92%	61.90%	60.84%	59.83%	58.75%

On a discounted basis the Alberta-Proposed system becomes more favorable to government than the system in Texas. The reason is that the Alberta system is more front end loaded. Due to the fact that the royalty changes with well productivity, the highest royalties are paid early in the life of the well in Alberta, while the royalties in Texas are flat. Therefore, on a discounted basis the Alberta system is more valuable to government.

Net Cash Flow per BOE

The following four maps provide the overview of the Net Cash per BOE for the investor on an undiscounted basis.

Table 4.005 ALBERTA-NEW GAS WELL
Net Cash (\$ Cdn) per BOE
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$1.50	\$2.90
5	\$1.55	\$1.78	\$2.28	\$2.82	\$3.70	\$4.83	\$6.20
6	\$5.77	\$5.76	\$6.08	\$6.43	\$7.18	\$8.24	\$9.58
7	\$9.98	\$9.74	\$9.89	\$10.05	\$10.66	\$11.65	\$12.95
8	\$14.20	\$13.73	\$13.70	\$13.66	\$14.13	\$15.06	\$16.33
9	\$18.42	\$17.71	\$17.50	\$17.28	\$17.61	\$18.47	\$19.70
10	\$22.10	\$21.69	\$21.31	\$20.89	\$21.09	\$21.87	\$23.08
11	\$26.32	\$25.68	\$25.11	\$24.51	\$24.57	\$25.28	\$26.45

Table 4.015		ALBERTA-OLD			GAS WELL			
Net Cash (\$ Cdn) per BOE		HENRY HUB						
US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1	
3								
4						\$0.76	\$2.14	
5	\$1.30	\$1.34	\$1.70	\$2.09	\$2.87	\$3.94	\$5.29	
6	\$5.45	\$5.22	\$5.36	\$5.52	\$6.14	\$7.13	\$8.43	
7	\$9.60	\$9.09	\$9.03	\$8.96	\$9.40	\$10.31	\$11.57	
8	\$13.76	\$12.96	\$12.69	\$12.39	\$12.67	\$13.49	\$14.72	
9	\$17.91	\$16.84	\$16.35	\$15.82	\$15.93	\$16.68	\$17.86	
10	\$21.54	\$20.71	\$20.01	\$19.25	\$19.20	\$19.86	\$21.00	
11	\$25.70	\$24.58	\$23.67	\$22.68	\$22.46	\$23.05	\$24.14	

Table 5.005		ALBERTA-PROPOSED			GAS WELL			
Net Cash (\$ Cdn) per BOE		HENRY HUB						
US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1	
3								
4						\$1.48	\$2.76	
5	\$3.48	\$3.51	\$3.54	\$3.38	\$3.58	\$4.36	\$5.56	
6	\$7.78	\$7.37	\$7.06	\$6.49	\$6.35	\$6.96	\$8.08	
7	\$11.70	\$10.90	\$10.25	\$9.29	\$8.82	\$9.27	\$10.30	
8	\$15.22	\$14.09	\$13.14	\$11.79	\$10.99	\$11.29	\$12.24	
9	\$18.47	\$17.00	\$15.73	\$14.01	\$13.05	\$13.30	\$14.25	
10	\$21.74	\$19.63	\$18.05	\$16.32	\$15.50	\$15.83	\$16.83	
11	\$24.42	\$21.97	\$20.08	\$18.46	\$17.88	\$18.34	\$19.39	

Table 4.025		TEXAS			GAS WELL			
Net Cash (\$ Cdn) per BOE		HENRY HUB						
US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1	
3							\$1.61	
4					\$1.96	\$3.19	\$4.70	
5		\$1.24	\$2.35	\$3.58	\$5.05	\$6.28	\$7.79	
6	\$3.33	\$4.33	\$5.44	\$6.67	\$8.14	\$9.37	\$10.88	
7	\$6.42	\$7.42	\$8.54	\$9.76	\$11.23	\$12.46	\$13.97	
8	\$9.51	\$10.51	\$11.63	\$12.85	\$14.32	\$15.55	\$17.06	
9	\$12.60	\$13.60	\$14.72	\$15.95	\$17.41	\$18.65	\$20.15	
10	\$15.69	\$16.69	\$17.81	\$19.04	\$20.50	\$21.74	\$23.24	
11	\$18.78	\$19.78	\$20.90	\$22.13	\$23.59	\$24.83	\$26.33	

At the US \$ 5 – US \$ 6 Henry Hub level the Alberta-Proposed terms provide for a much stronger Net Cash to investors than Alberta New and Old or the Texas terms. Therefore, additional interest can be expected in the drilling of gas wells in Alberta. Prolific wells are somewhat less attractive. However, in general these wells do not need additional incentives.

IRR

Following are the four maps for the IRR.

Table 4.008 **ALBERTA-NEW** **GAS WELL**
IRR (real, 2007 Cdn \$)
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						15.26%	51.63%
5	9.96%	10.55%	14.17%	19.67%	34.28%	68.97%	100.00%
6	43.13%	39.60%	44.51%	55.03%	91.25%	100.00%	100.00%
7	93.78%	82.67%	90.74%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.018 **ALBERTA-OLD** **GAS WELL**
IRR (real, 2007 Cdn \$)
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						7.07%	33.71%
5	8.20%	7.68%	10.04%	13.55%	24.04%	49.63%	100.00%
6	39.59%	33.94%	36.23%	42.33%	67.13%	100.00%	100.00%
7	86.21%	71.16%	73.76%	86.46%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 5.008 **ALBERTA-PROPOSED** **GAS WELL**
IRR (real, 2007 Cdn \$)
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						13.65%	45.16%
5	24.70%	22.01%	21.89%	21.52%	28.32%	52.85%	100.00%
6	65.02%	52.96%	49.22%	46.60%	61.05%	100.00%	100.00%
7	100.00%	93.77%	83.20%	77.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.028 TEXAS GAS WELL

IRR (real, 2007 Cdn \$)

HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							37.31%
4					23.25%	62.86%	100.00%
5		9.95%	22.11%	42.97%	92.88%	100.00%	100.00%
6	30.87%	42.69%	67.37%	100.00%	100.00%	100.00%	100.00%
7	76.48%	99.57%	100.00%	100.00%	100.00%	100.00%	100.00%
8	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

The IRR results confirm that the Alberta-Proposed system would be more attractive to investors for the marginal wells at current prices.

PFR10

Following are the maps for the Profitability Ratio discounted at 10% real.

Table 4.009 ALBERTA-NEW GAS WELL

PFR10 (real, 2007 Cdn \$)

HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						1.07	1.43
5	1.00	1.01	1.06	1.13	1.29	1.56	2.09
6	1.33	1.34	1.40	1.50	1.72	2.07	2.76
7	1.66	1.66	1.75	1.87	2.14	2.57	3.43
8	1.99	1.99	2.09	2.23	2.56	3.07	4.10
9	2.31	2.32	2.43	2.60	2.98	3.58	4.77
10	2.56	2.65	2.78	2.97	3.40	4.08	5.44
11	2.88	2.98	3.12	3.34	3.82	4.58	6.11

Table 4.019 ALBERTA-OLD GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						0.96	1.28
5	0.98	0.97	1.00	1.05	1.19	1.43	1.90
6	1.30	1.29	1.33	1.40	1.58	1.90	2.52
7	1.63	1.61	1.66	1.75	1.98	2.36	3.15
8	1.95	1.92	1.99	2.09	2.37	2.83	3.77
9	2.27	2.24	2.32	2.44	2.76	3.30	4.40
10	2.52	2.56	2.65	2.79	3.16	3.77	5.02
11	2.83	2.88	2.98	3.14	3.55	4.24	5.64

Table 5.009 ALBERTA-PROPOSED GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						1.05	1.39
5	1.15	1.15	1.16	1.17	1.26	1.47	1.94
6	1.49	1.47	1.48	1.48	1.58	1.85	2.44
7	1.79	1.75	1.76	1.76	1.88	2.19	2.88
8	2.07	2.02	2.02	2.01	2.13	2.48	3.26
9	2.32	2.25	2.25	2.23	2.38	2.77	3.66
10	2.47	2.47	2.46	2.46	2.68	3.16	4.18
11	2.67	2.66	2.64	2.68	2.98	3.54	4.69

Table 4.029 TEXAS GAS WELL
PFR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							1.22
4					1.12	1.37	1.84
5		1.00	1.11	1.26	1.50	1.83	2.46
6	1.17	1.26	1.39	1.58	1.88	2.29	3.08
7	1.41	1.52	1.68	1.90	2.26	2.76	3.70
8	1.65	1.77	1.96	2.22	2.64	3.22	4.31
9	1.89	2.03	2.25	2.54	3.02	3.68	4.93
10	2.13	2.29	2.53	2.86	3.40	4.14	5.55
11	2.38	2.55	2.81	3.18	3.78	4.60	6.17

The PFR10 data confirm that marginal wells under the current price range for the Proposed system would be much more attractive than under either Alberta-New or Alberta-Old or Texas.

What is also important to note, the PFR10 typically goes up when prices increase and well become more productive. In other words, despite the royalty that increases strongly with price and volume, the profitability nevertheless increases with better wells. In other words, the Alberta-Proposed terms typically encourage rational commercial behavior on the part of investors.

NPV10/BOE

Table 4.010 **ALBERTA-NEW** **GAS WELL**
NPV10/BOE
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						\$0.39	\$1.77
5	\$0.00	\$0.07	\$0.53	\$1.07	\$1.99	\$3.12	\$4.48
6	\$3.61	\$3.40	\$3.67	\$4.04	\$4.84	\$5.92	\$7.26
7	\$7.22	\$6.73	\$6.82	\$7.01	\$7.69	\$8.72	\$10.03
8	\$10.83	\$10.06	\$9.97	\$9.98	\$10.53	\$11.51	\$12.81
9	\$14.44	\$13.39	\$13.11	\$12.95	\$13.38	\$14.31	\$15.58
10	\$17.61	\$16.71	\$16.26	\$15.92	\$16.23	\$17.11	\$18.35
11	\$21.19	\$20.04	\$19.41	\$18.89	\$19.08	\$19.90	\$21.13

Table 4.020 **ALBERTA-OLD** **GAS WELL**
NPV10/BOE
HENRY HUB
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						-\$0.24	\$1.14
5	-\$0.23	-\$0.32	\$0.01	\$0.42	\$1.27	\$2.37	\$3.72
6	\$3.32	\$2.90	\$3.02	\$3.23	\$3.93	\$4.97	\$6.30
7	\$6.87	\$6.13	\$6.03	\$6.03	\$6.59	\$7.58	\$8.87
8	\$10.43	\$9.36	\$9.05	\$8.84	\$9.26	\$10.18	\$11.45
9	\$13.98	\$12.59	\$12.06	\$11.64	\$11.92	\$12.79	\$14.03
10	\$17.10	\$15.82	\$15.08	\$14.45	\$14.59	\$15.39	\$16.61
11	\$20.62	\$19.04	\$18.09	\$17.25	\$17.25	\$18.00	\$19.19

Table 5.010		ALBERTA-PROPOSED				GAS WELL		
NPV10/BOE								
HENRY HUB								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3								
4							\$0.30	\$1.61
5		\$1.70	\$1.52	\$1.51	\$1.39	\$1.73	\$2.63	\$3.89
6		\$5.35	\$4.72	\$4.37	\$3.89	\$3.95	\$4.72	\$5.94
7		\$8.69	\$7.63	\$6.97	\$6.13	\$5.92	\$6.59	\$7.75
8		\$11.71	\$10.29	\$9.32	\$8.14	\$7.66	\$8.21	\$9.33
9		\$14.49	\$12.71	\$11.43	\$9.91	\$9.32	\$9.85	\$10.97
10		\$16.59	\$14.89	\$13.31	\$11.82	\$11.37	\$11.97	\$13.12
11		\$18.86	\$16.83	\$14.95	\$13.60	\$13.39	\$14.08	\$15.26

Table 4.030		TEXAS				GAS WELL		
NPV10/BOE								
HENRY HUB								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3								\$0.92
4						\$0.82	\$2.07	\$3.47
5			-\$0.01	\$1.01	\$2.13	\$3.38	\$4.63	\$6.03
6		\$1.82	\$2.61	\$3.61	\$4.72	\$5.95	\$7.19	\$8.58
7		\$4.48	\$5.22	\$6.20	\$7.30	\$8.52	\$9.75	\$11.14
8		\$7.14	\$7.83	\$8.80	\$9.88	\$11.09	\$12.31	\$13.69
9		\$9.80	\$10.44	\$11.39	\$12.47	\$13.65	\$14.86	\$16.24
10		\$12.46	\$13.05	\$13.99	\$15.05	\$16.22	\$17.42	\$18.80
11		\$15.13	\$15.66	\$16.58	\$17.63	\$18.79	\$19.98	\$21.35

The NPV10/BOE behavior is rather different between Texas and Alberta. In Texas the NPV10/BOE goes up automatically with better wells. In the case of Alberta, for the higher prices, the very marginal wells have a higher NPV10/BOE and so do the very productive wells, compared to the average wells. The Alberta-Proposed system reinforces this concept. This is due to the royalties that strongly increase with price and well productivity.

It is highly unlikely that this will result in a-commercial behavior by investors or producers because the PFR10 typically improves with better wells and so does the IRR.

Also, the increase in volume more than compensates for the reduction in NPV10/BOE for the average wells compared to the marginal wells as will be demonstrated in the following NPV10 analysis.

NPV10

The following table shows the NPV10 results for the proposed system.

Table 5.020.		ALBERTA-PROPOSED				GAS WELL		
NPV10 (\$ million) (real, 2007 Cdn \$)								
HENRY HUB								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3								
4							\$163	\$1,780
5		\$43	\$81	\$122	\$189	\$477	\$1,452	\$4,310
6		\$136	\$251	\$354	\$529	\$1,086	\$2,612	\$6,580
7		\$221	\$407	\$564	\$835	\$1,629	\$3,641	\$8,590
8		\$298	\$549	\$755	\$1,108	\$2,107	\$4,541	\$10,342
9		\$369	\$677	\$926	\$1,349	\$2,563	\$5,447	\$12,165
10		\$434	\$794	\$1,078	\$1,609	\$3,127	\$6,617	\$14,542
11		\$494	\$897	\$1,211	\$1,852	\$3,682	\$7,783	\$16,919

As expected, the NPV10 improves strongly with better wells and therefore there is sufficient indication that investors and producers will follow a rational commercial behavior as a result of the proposed royalty system for conventional gas.

5.3. Analysis of proposed oil terms

Gross Revenues per barrel, Total Expenditures per barrel and Divisible Income per barrel.

These are the same as provided in Chapter 4

Gross Revenues per barrel

Following are the gross revenues per barrel maps.

Table4.074 ALBERTA TH TIER OIL WELL
Government Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$2.69	\$3.44
30		\$0.93	\$2.79	\$5.04	\$6.96	\$8.56	\$9.60
40	\$3.07	\$4.56	\$6.92	\$10.06	\$12.74	\$14.88	\$16.27
50	\$6.52	\$8.13	\$10.84	\$14.59	\$17.77	\$20.26	\$21.86
60	\$9.96	\$11.68	\$14.70	\$19.00	\$22.64	\$25.45	\$27.26
70	\$13.41	\$15.22	\$18.56	\$23.41	\$27.51	\$30.64	\$32.66
80	\$16.86	\$18.77	\$22.42	\$27.81	\$32.38	\$35.83	\$38.06
90	\$20.30	\$22.32	\$26.28	\$32.22	\$37.25	\$41.02	\$43.46
100	\$23.75	\$25.87	\$30.13	\$36.63	\$42.11	\$46.22	\$48.86

Table 4.084 ALBERTA-NEW OIL WELL
Government Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$3.65	\$4.50
30			\$3.55	\$5.99	\$8.15	\$9.94	\$11.11
40	\$3.81	\$5.45	\$7.91	\$11.12	\$13.96	\$16.24	\$17.73
50	\$7.49	\$9.29	\$12.13	\$15.98	\$19.40	\$22.09	\$23.85
60	\$11.14	\$13.08	\$16.25	\$20.68	\$24.60	\$27.66	\$29.66
70	\$14.78	\$16.86	\$20.38	\$25.37	\$29.80	\$33.22	\$35.47
80	\$18.43	\$20.65	\$24.50	\$30.07	\$35.01	\$38.79	\$41.28
90	\$22.07	\$24.43	\$28.62	\$34.76	\$40.21	\$44.36	\$47.09
100	\$25.72	\$28.22	\$32.75	\$39.45	\$45.41	\$49.93	\$52.89

Table 4.094 ALBERTA-OLD OIL WELL
Government Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			\$4.23	\$7.21	\$9.85	\$11.99	\$13.38
40	\$4.00	\$5.75	\$8.47	\$12.12	\$15.35	\$17.91	\$19.59
50	\$7.68	\$9.60	\$12.71	\$17.03	\$20.85	\$23.84	\$25.80
60	\$11.37	\$13.44	\$16.95	\$21.93	\$26.36	\$29.77	\$32.01
70	\$15.05	\$17.29	\$21.19	\$26.84	\$31.86	\$35.69	\$38.21
80	\$18.74	\$21.14	\$25.44	\$31.75	\$37.36	\$41.62	\$44.42
90	\$22.42	\$24.99	\$29.68	\$36.66	\$42.86	\$47.55	\$50.63
100	\$26.11	\$28.84	\$33.92	\$41.57	\$48.36	\$53.48	\$56.84

Table 5.034 ALBERTA-PROPOSED OIL WELL
Government Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$5.09
30		\$0.63	\$1.84	\$4.00	\$7.11	\$9.61	\$10.97
40	\$2.93	\$4.04	\$5.53	\$8.49	\$12.57	\$15.73	\$17.43
50	\$6.34	\$7.45	\$9.68	\$13.52	\$18.60	\$22.44	\$24.48
60	\$9.90	\$11.64	\$14.58	\$19.23	\$25.28	\$29.78	\$32.14
70	\$15.07	\$17.08	\$20.41	\$25.70	\$32.63	\$37.74	\$40.42
80	\$21.05	\$23.20	\$26.86	\$32.77	\$40.58	\$45.91	\$48.62
90	\$27.62	\$29.91	\$33.90	\$40.44	\$48.67	\$53.46	\$55.90
100	\$34.22	\$36.59	\$40.80	\$47.90	\$56.06	\$60.48	\$62.82

Table 4.104 TEXAS OIL WELL
Government & Private Income + Participation per barrel (\$ Cdn)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$11.96	\$12.96	\$13.64
40			\$15.68	\$16.94	\$18.01	\$19.01	\$19.69
50	\$19.02	\$20.29	\$21.74	\$23.00	\$24.07	\$25.06	\$25.74
60	\$25.07	\$26.34	\$27.79	\$29.05	\$30.12	\$31.11	\$31.80
70	\$31.12	\$32.39	\$33.84	\$35.10	\$36.17	\$37.16	\$37.85
80	\$37.17	\$38.44	\$39.89	\$41.15	\$42.22	\$43.22	\$43.90
90	\$43.22	\$44.49	\$45.94	\$47.20	\$48.27	\$49.27	\$49.95
100	\$49.27	\$50.54	\$51.99	\$53.25	\$54.32	\$55.32	\$56.00

The proposed system results in lower government revenues per barrel for marginal wells under low prices, but much higher revenues under high prices.

Royalties per barrel

Following are the royalties per barrel maps.

Table 5.041 ALBERTA TH TIER OIL WELL

Royalties/BOE

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20	\$0.04	\$0.15	\$0.48	\$1.07	\$1.56	\$1.91	\$2.15
30	\$0.11	\$0.42	\$1.37	\$3.04	\$4.45	\$5.43	\$6.07
40	\$0.20	\$0.74	\$2.40	\$5.34	\$7.83	\$9.59	\$10.72
50	\$0.26	\$0.96	\$3.12	\$6.95	\$10.15	\$12.40	\$13.84
60	\$0.31	\$1.16	\$3.77	\$8.37	\$12.23	\$14.94	\$16.69
70	\$0.36	\$1.36	\$4.41	\$9.80	\$14.32	\$17.49	\$19.53
80	\$0.41	\$1.56	\$5.05	\$11.23	\$16.40	\$20.03	\$22.38
90	\$0.47	\$1.76	\$5.69	\$12.65	\$18.49	\$22.58	\$25.22
100	\$0.52	\$1.95	\$6.33	\$14.08	\$20.57	\$25.13	\$28.06

Table 5.042 ALBERTA-NEW OIL WELL

Royalties/BOE

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20	\$0.36	\$0.57	\$1.09	\$1.96	\$2.73	\$3.28	\$3.65
30	\$0.81	\$1.29	\$2.45	\$4.40	\$6.15	\$7.40	\$8.22
40	\$1.26	\$2.01	\$3.81	\$6.85	\$9.57	\$11.52	\$12.82
50	\$1.65	\$2.62	\$4.97	\$8.94	\$12.47	\$15.01	\$16.69
60	\$1.98	\$3.16	\$5.98	\$10.77	\$15.04	\$18.09	\$20.12
70	\$2.32	\$3.70	\$7.00	\$12.61	\$17.60	\$21.18	\$23.54
80	\$2.66	\$4.24	\$8.02	\$14.44	\$20.16	\$24.26	\$26.97
90	\$3.00	\$4.78	\$9.04	\$16.28	\$22.72	\$27.34	\$30.40
100	\$3.33	\$5.32	\$10.06	\$18.11	\$25.29	\$30.43	\$33.83

Table 5.043 ALBERTA-OLD OIL WELL

Royalties/BOE

WTI

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20	\$0.69	\$1.10	\$2.08	\$3.75	\$5.24	\$6.30	\$7.00
30	\$1.13	\$1.80	\$3.41	\$6.14	\$8.57	\$10.32	\$11.47
40	\$1.52	\$2.43	\$4.60	\$8.28	\$11.56	\$13.91	\$15.47
50	\$1.92	\$3.06	\$5.79	\$10.43	\$14.55	\$17.51	\$19.47
60	\$2.31	\$3.69	\$6.98	\$12.57	\$17.54	\$21.11	\$23.47
70	\$2.71	\$4.32	\$8.17	\$14.71	\$20.53	\$24.71	\$27.47
80	\$3.10	\$4.95	\$9.36	\$16.85	\$23.52	\$28.30	\$31.47
90	\$3.50	\$5.58	\$10.55	\$18.99	\$26.51	\$31.90	\$35.47
100	\$3.89	\$6.20	\$11.74	\$21.13	\$29.50	\$35.50	\$39.47

Table 5.044		ALBERTA-PROPOSED			OIL WELL			
Royalties/BOE								
WTI								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20		\$0.00	\$0.00	\$0.00	\$0.61	\$2.44	\$3.82	\$4.50
30		\$0.00	\$0.00	\$0.00	\$1.56	\$4.66	\$6.92	\$8.03
40		\$0.00	\$0.00	\$0.40	\$3.11	\$7.59	\$10.80	\$12.39
50		\$0.00	\$0.00	\$1.46	\$5.41	\$11.33	\$15.52	\$17.59
60		\$0.21	\$1.10	\$3.60	\$8.70	\$16.00	\$21.13	\$23.67
70		\$2.73	\$4.01	\$7.05	\$13.08	\$21.64	\$27.63	\$30.62
80		\$6.41	\$7.89	\$11.40	\$18.31	\$28.13	\$34.43	\$37.47
90		\$10.92	\$12.61	\$16.58	\$24.39	\$34.82	\$40.35	\$43.00
100		\$15.48	\$17.28	\$21.58	\$30.19	\$40.50	\$45.51	\$48.01

As can be clearly seen, the royalties are set at 0% under low prices and marginal levels of production, but royalties are much more favorable to government under high prices.

Royalty rates

Following are the maps on the royalty rates.

Table 5.045		ALBERTA TH TIER			OIL WELL			
Royalty Rate								
WTI								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20		0.19%	0.70%	2.26%	5.03%	7.36%	9.02%	10.11%
30		0.34%	1.30%	4.20%	9.34%	13.64%	16.66%	18.61%
40		0.45%	1.68%	5.46%	12.15%	17.81%	21.81%	24.40%
50		0.46%	1.74%	5.65%	12.56%	18.35%	22.41%	25.03%
60		0.46%	1.74%	5.65%	12.56%	18.35%	22.41%	25.03%
70		0.46%	1.74%	5.65%	12.56%	18.35%	22.41%	25.03%
80		0.46%	1.74%	5.65%	12.56%	18.35%	22.41%	25.03%
90		0.46%	1.74%	5.65%	12.56%	18.35%	22.41%	25.03%
100		0.46%	1.74%	5.65%	12.56%	18.35%	22.41%	25.03%

Table 5.046 ALBERTA-NEW OIL WELL

Royalty Rate								
WTI								
US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1	
20	1.70%	2.70%	5.12%	9.21%	12.86%	15.47%	17.20%	
30	2.49%	3.97%	7.51%	13.51%	18.86%	22.69%	25.23%	
40	2.87%	4.58%	8.66%	15.59%	21.77%	26.21%	29.17%	
50	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%	
60	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%	
70	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%	
80	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%	
90	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%	
100	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%	

Table 5.047 ALBERTA-OLD OIL WELL

Royalty Rate								
WTI								
US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1	
20	3.25%	5.19%	9.82%	17.67%	24.66%	29.68%	33.00%	
30	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	
40	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	
50	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	
60	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	
70	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	
80	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	
90	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	
100	3.47%	5.53%	10.47%	18.85%	26.31%	31.66%	35.20%	

As can be clearly seen, under the current Third Tier, New and Old Alberta systems the royalties do not change any further with price, except for very low price levels. This is contrary to the original concept of 1974 which intended to create a price progressive system.

Table 5.048		ALBERTA-PROPOSED				OIL WELL		
Royalty Rate								
WTI								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20		0.00%	0.00%	0.00%	2.89%	11.48%	17.99%	21.18%
30		0.00%	0.00%	0.00%	4.78%	14.29%	21.23%	24.65%
40		0.00%	0.00%	0.92%	7.07%	17.27%	24.58%	28.19%
50		0.00%	0.00%	2.64%	9.79%	20.49%	28.05%	31.80%
60		0.32%	1.66%	5.39%	13.05%	24.00%	31.68%	35.49%
70		3.50%	5.14%	9.04%	16.76%	27.72%	35.40%	39.23%
80		7.17%	8.83%	12.75%	20.48%	31.46%	38.51%	41.91%
90		10.84%	12.51%	16.46%	24.21%	34.55%	40.04%	42.67%
100		13.80%	15.41%	19.24%	26.92%	36.11%	40.59%	42.81%

Under the proposed system the price progressive nature of the Alberta conventional oil system is re-established, with much higher royalties at high prices. Also the royalties are set at 0% for low productivity wells at prices below US \$ 60 per barrel. Very prolific wells at high prices now result in royalties over 40%.

The following table shows the difference between the Proposed system and the weighted average of the current systems. The weighting was created by using 20% for Third Tier wells, 55% for New Oil wells and 25% for Old Oil wells.

Table 5.049		ALBERTA-PROPOSED				OIL WELL		
Royalty differential- average								
WTI								
US \$								
20		-1.78%	-2.92%	-5.72%	-7.59%	-3.23%	0.26%	1.45%
30		-2.30%	-3.82%	-7.59%	-9.22%	-5.39%	-2.50%	-1.74%
40		-2.53%	-4.24%	-7.55%	-8.65%	-4.84%	-2.12%	-1.53%
50		-2.60%	-4.34%	-6.05%	-6.32%	-2.16%	0.73%	1.40%
60		-2.27%	-2.68%	-3.29%	-3.06%	1.35%	4.36%	5.09%
70		0.90%	0.80%	0.35%	0.65%	5.07%	8.08%	8.84%
80		4.57%	4.49%	4.06%	4.37%	8.81%	11.19%	11.51%
90		8.24%	8.17%	7.77%	8.10%	11.90%	12.72%	12.27%
100		11.21%	11.07%	10.56%	10.81%	13.46%	13.27%	12.42%

At low prices, producers will generally find that the system provides for lower royalties, in particular for the marginal wells. Under higher prices, the royalties are much higher. At US \$ 60 per barrel WTI, marginal wells will result in average in lower royalties and prolific wells will result in higher royalties.

The following charts provide the comparison with the individual vintages.

Table 5.051		ALBERTA-PROPOSED				OIL WELL		
Royalty differential-Third Tier								
WTI								
US \$								
20	-0.19%	-0.70%	-2.26%	-2.13%	4.12%	8.97%	11.07%	
30	-0.34%	-1.30%	-4.20%	-4.55%	0.64%	4.57%	6.04%	
40	-0.45%	-1.68%	-4.54%	-5.09%	-0.54%	2.77%	3.79%	
50	-0.46%	-1.74%	-3.01%	-2.77%	2.14%	5.65%	6.77%	
60	-0.14%	-0.08%	-0.25%	0.49%	5.65%	9.27%	10.46%	
70	3.03%	3.40%	3.39%	4.20%	9.38%	13.00%	14.21%	
80	6.70%	7.08%	7.10%	7.92%	13.11%	16.11%	16.88%	
90	10.37%	10.77%	10.81%	11.65%	16.20%	17.63%	17.64%	
100	13.34%	13.66%	13.59%	14.36%	17.77%	18.18%	17.79%	

Table 5.052		ALBERTA-PROPOSED				OIL WELL		
Royalty differential-New-Oil								
WTI								
US \$								
20	-1.70%	-2.70%	-5.12%	-6.32%	-1.38%	2.52%	3.98%	
30	-2.49%	-3.97%	-7.51%	-8.72%	-4.57%	-1.46%	-0.57%	
40	-2.87%	-4.58%	-7.74%	-8.53%	-4.50%	-1.64%	-0.98%	
50	-2.97%	-4.74%	-6.34%	-6.37%	-2.06%	0.92%	1.63%	
60	-2.65%	-3.09%	-3.58%	-3.10%	1.45%	4.55%	5.32%	
70	0.52%	0.40%	0.06%	0.60%	5.17%	8.27%	9.07%	
80	4.19%	4.08%	3.77%	4.33%	8.91%	11.38%	11.74%	
90	7.86%	7.77%	7.48%	8.05%	12.00%	12.91%	12.50%	
100	10.83%	10.66%	10.27%	10.76%	13.56%	13.45%	12.64%	

Table 5.053		ALBERTA-PROPOSED				OIL WELL		
Royalty differential-Old-Oil								
WTI								
US \$								
20	-3.25%	-5.19%	-9.82%	-14.77%	-13.19%	-11.69%	-11.82%	
30	-3.47%	-5.53%	-10.47%	-14.06%	-12.02%	-10.43%	-10.54%	
40	-3.47%	-5.53%	-9.55%	-11.78%	-9.04%	-7.08%	-7.01%	
50	-3.47%	-5.53%	-7.84%	-9.06%	-5.82%	-3.61%	-3.40%	
60	-3.15%	-3.88%	-5.08%	-5.80%	-2.31%	0.02%	0.29%	
70	0.03%	-0.39%	-1.43%	-2.09%	1.42%	3.75%	4.04%	
80	3.70%	3.29%	2.28%	1.64%	5.15%	6.86%	6.71%	
90	7.37%	6.98%	5.98%	5.36%	8.24%	8.38%	7.47%	
100	10.33%	9.87%	8.77%	8.07%	9.81%	8.93%	7.62%	

As can be expected the Third Tier producers will see the least improvement under low prices and for marginal wells, while the Old Oil producers see the most improvement.

Undiscounted Government Take

Following are the maps for the undiscounted government take.

**Table 4.076 ALBERTA TH TIER OIL WELL
Undiscounted Government Take (Income only)**

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						61.05%	53.97%
30		48.69%	47.00%	52.77%	54.80%	54.29%	54.08%
40	32.23%	34.36%	40.00%	48.09%	52.92%	54.83%	55.88%
50	31.21%	32.99%	37.81%	45.20%	50.16%	52.61%	54.01%
60	30.90%	32.43%	36.72%	43.53%	48.38%	51.03%	52.59%
70	30.75%	32.14%	36.10%	42.55%	47.30%	50.04%	51.68%
80	30.66%	31.96%	35.72%	41.91%	46.57%	49.36%	51.04%
90	30.60%	31.84%	35.45%	41.45%	46.05%	48.86%	50.58%
100	30.56%	31.75%	35.25%	41.11%	45.65%	48.48%	50.22%

**Table 4.086 ALBERTA-NEW OIL WELL
Undiscounted Government Take (Income only)**

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						82.79%	70.49%
30			59.68%	62.73%	64.16%	63.01%	62.59%
40	40.05%	41.07%	45.70%	53.15%	57.99%	59.83%	60.93%
50	35.87%	37.70%	42.30%	49.52%	54.75%	57.37%	58.93%
60	34.53%	36.32%	40.59%	47.38%	52.57%	55.46%	57.22%
70	33.90%	35.60%	39.64%	46.12%	51.25%	54.26%	56.12%
80	33.52%	35.16%	39.03%	45.30%	50.35%	53.44%	55.36%
90	33.27%	34.86%	38.61%	44.72%	49.71%	52.83%	54.80%
100	33.10%	34.65%	38.30%	44.28%	49.23%	52.38%	54.37%

Table 4.096 ALB ERTA-OLD OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			71.05%	75.48%	77.54%	75.97%	75.41%
40	41.99%	43.29%	48.92%	57.94%	63.79%	66.00%	67.30%
50	36.79%	38.95%	44.32%	52.75%	58.86%	61.92%	63.74%
60	35.25%	37.34%	42.34%	50.26%	56.32%	59.69%	61.75%
70	34.52%	36.51%	41.23%	48.80%	54.78%	58.30%	60.47%
80	34.08%	36.00%	40.53%	47.84%	53.74%	57.34%	59.58%
90	33.80%	35.66%	40.04%	47.16%	52.99%	56.63%	58.93%
100	33.60%	35.41%	39.68%	46.65%	52.43%	56.10%	58.42%

Table 5.036 ALBERTA-PROPOSED OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							79.76%
30		33.22%	30.88%	41.89%	55.95%	60.90%	61.85%
40	30.78%	30.46%	31.94%	40.61%	52.23%	57.97%	59.89%
50	30.36%	30.25%	33.74%	41.88%	52.50%	58.29%	60.49%
60	30.70%	32.32%	36.42%	44.06%	54.02%	59.72%	62.01%
70	34.55%	36.06%	39.71%	46.72%	56.11%	61.64%	63.96%
80	38.29%	39.51%	42.79%	49.38%	58.37%	63.25%	65.21%
90	41.63%	42.68%	45.73%	52.02%	60.18%	63.68%	65.06%
100	44.04%	44.92%	47.73%	53.77%	60.77%	63.45%	64.57%

The difference between the Proposed system and the three current Alberta systems is clearly illustrated by the fact that for marginal wells and under low prices the government take is now very low by international standards (“gold” area). This is amply justified by these specific circumstances. High government takes under low prices are now avoided.

In return the system now has an average government take (“green”) for all prolific wells. This overall system is now clearly progressive with price and well productivity.

Table 4.106 TEXAS OIL WELL
Undiscounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					85.43%	75.90%	71.64%
40			84.28%	76.28%	71.01%	66.85%	64.77%
50	85.73%	78.22%	72.52%	68.48%	65.52%	62.97%	61.63%
60	74.73%	70.61%	67.22%	64.63%	62.62%	60.81%	59.84%
70	69.29%	66.56%	64.21%	62.34%	60.83%	59.44%	58.68%
80	66.05%	64.04%	62.26%	60.81%	59.61%	58.48%	57.87%
90	63.90%	62.32%	60.91%	59.72%	58.73%	57.79%	57.26%
100	62.37%	61.07%	59.90%	58.91%	58.07%	57.25%	56.80%

Compared to Texas the Proposed system has now higher government takes under high prices and high productivity wells. Yet, counter-productive high government takes under low prices and marginal wells are avoided by the Proposed system. From a competitive international point of view, the Proposed system would encourage much more drilling in Alberta, but would result in a competitive fair share for Alberta under favorable conditions.

5% Discounted Government Take

The following maps provide for the 5% discounted real government take.

Table 4.077 ALBERTA TH TIER OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						70.52%	58.64%
30		89.21%	54.50%	58.10%	58.63%	56.83%	56.03%
40	34.90%	36.28%	42.11%	50.62%	55.25%	56.63%	57.32%
50	32.31%	33.96%	39.08%	46.93%	51.87%	54.02%	55.16%
60	31.59%	33.10%	37.66%	44.90%	49.78%	52.21%	53.55%
70	31.26%	32.65%	36.88%	43.72%	48.52%	51.08%	52.53%
80	31.07%	32.38%	36.38%	42.95%	47.68%	50.31%	51.82%
90	30.94%	32.20%	36.04%	42.41%	47.07%	49.75%	51.30%
100	30.85%	32.08%	35.79%	42.01%	46.62%	49.32%	50.90%

Table 4.087 ALBERTA-NEW OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						97.25%	77.50%
30			70.10%	69.44%	68.94%	66.18%	65.02%
40	43.90%	43.66%	48.24%	55.99%	60.61%	61.87%	62.57%
50	37.31%	38.96%	43.80%	51.44%	56.67%	58.95%	60.23%
60	35.42%	37.16%	41.69%	48.88%	54.13%	56.78%	58.31%
70	34.54%	36.25%	40.53%	47.40%	52.60%	55.43%	57.08%
80	34.03%	35.69%	39.80%	46.44%	51.57%	54.50%	56.23%
90	33.70%	35.32%	39.30%	45.76%	50.84%	53.83%	55.61%
100	33.47%	35.05%	38.93%	45.25%	50.29%	53.32%	55.13%

Table 4.097 ALBERTA-OLD OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			84.39%	84.26%	83.86%	80.18%	78.63%
40	46.15%	46.13%	51.80%	61.24%	66.86%	68.42%	69.25%
50	38.30%	40.30%	45.99%	54.92%	61.04%	63.73%	65.23%
60	36.18%	38.25%	43.56%	51.96%	58.10%	61.21%	62.99%
70	35.19%	37.21%	42.22%	50.25%	56.32%	59.64%	61.57%
80	34.62%	36.57%	41.38%	49.13%	55.14%	58.56%	60.58%
90	34.25%	36.15%	40.80%	48.35%	54.29%	57.78%	59.86%
100	33.99%	35.85%	40.38%	47.76%	53.65%	57.18%	59.31%

Table 5.037 ALBERTA-PROPOSED OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							88.86%
30		54.71%	33.91%	45.73%	60.67%	64.56%	64.62%
40	33.17%	31.82%	33.08%	42.59%	55.01%	60.40%	61.78%
50	31.35%	30.95%	34.68%	43.48%	54.74%	60.29%	62.04%
60	31.37%	32.98%	37.32%	45.50%	55.99%	61.49%	63.37%
70	35.18%	36.67%	40.52%	48.01%	57.88%	63.25%	65.18%
80	38.87%	40.07%	43.54%	50.56%	60.01%	64.68%	66.29%
90	42.17%	43.20%	46.42%	53.12%	61.65%	64.88%	65.94%
100	44.56%	45.44%	48.43%	54.88%	62.15%	64.55%	65.38%

Table 4.107 TEXAS OIL WELL
5% Discounted Government Take (Income only)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					88.66%	77.55%	72.73%
40			87.33%	78.19%	72.25%	67.59%	65.28%
50	88.71%	80.19%	73.96%	69.50%	66.23%	63.42%	61.96%
60	76.30%	71.76%	68.12%	65.30%	63.11%	61.13%	60.07%
70	70.32%	67.34%	64.85%	62.83%	61.19%	59.68%	58.86%
80	66.80%	64.63%	62.76%	61.20%	59.90%	58.68%	58.01%
90	64.49%	62.79%	61.31%	60.04%	58.97%	57.95%	57.38%
100	62.85%	61.47%	60.24%	59.18%	58.27%	57.39%	56.90%

The Proposed Alberta system is also somewhat more front end loaded than Texas as a result of the fact that royalty rates decline with declining levels of production.

Net Cash per barrel

The following maps provide for the Net Cash per barrel.

Table 4.075 ALBERTA TH TIER OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$1.72	\$2.94
30		\$0.98	\$3.15	\$4.51	\$5.74	\$7.21	\$8.15
40	\$6.45	\$8.71	\$10.39	\$10.86	\$11.33	\$12.26	\$12.84
50	\$14.36	\$16.51	\$17.83	\$17.69	\$17.66	\$18.24	\$18.61
60	\$22.28	\$24.33	\$25.34	\$24.64	\$24.16	\$24.42	\$24.57
70	\$30.20	\$32.14	\$32.84	\$31.60	\$30.65	\$30.59	\$30.54
80	\$38.12	\$39.96	\$40.35	\$38.56	\$37.15	\$36.76	\$36.50
90	\$46.04	\$47.77	\$47.85	\$45.51	\$43.64	\$42.93	\$42.47
100	\$53.95	\$55.59	\$55.36	\$52.47	\$50.14	\$49.11	\$48.43

Table 4.085 ALBERTA-NEW OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$0.76	\$1.88
30			\$2.40	\$3.56	\$4.55	\$5.84	\$6.64
40	\$5.71	\$7.82	\$9.40	\$9.80	\$10.11	\$10.90	\$11.37
50	\$13.39	\$15.35	\$16.54	\$16.30	\$16.03	\$16.41	\$16.62
60	\$21.11	\$22.93	\$23.78	\$22.96	\$22.19	\$22.21	\$22.18
70	\$28.83	\$30.50	\$31.03	\$29.63	\$28.35	\$28.01	\$27.73
80	\$36.55	\$38.08	\$38.27	\$36.30	\$34.52	\$33.80	\$33.28
90	\$44.26	\$45.66	\$45.51	\$42.97	\$40.68	\$39.60	\$38.84
100	\$51.98	\$53.24	\$52.75	\$49.64	\$46.84	\$45.39	\$44.39

Table 4.095 ALBERTA-OLD OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			\$1.72	\$2.34	\$2.85	\$3.79	\$4.36
40	\$5.52	\$7.53	\$8.84	\$8.80	\$8.72	\$9.23	\$9.52
50	\$13.20	\$15.04	\$15.96	\$15.25	\$14.58	\$14.66	\$14.67
60	\$20.88	\$22.56	\$23.09	\$21.71	\$20.44	\$20.10	\$19.83
70	\$28.56	\$30.07	\$30.21	\$28.16	\$26.30	\$25.54	\$24.98
80	\$36.24	\$37.59	\$37.33	\$34.62	\$32.16	\$30.97	\$30.14
90	\$43.92	\$45.10	\$44.45	\$41.07	\$38.02	\$36.41	\$35.29
100	\$51.59	\$52.61	\$51.57	\$47.53	\$43.89	\$41.84	\$40.45

Table 5.035 ALBERTA-PROPOSED OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$1.29
30		\$1.28	\$4.11	\$5.55	\$5.60	\$6.17	\$6.77
40	\$6.59	\$9.23	\$11.78	\$12.42	\$11.50	\$11.41	\$11.67
50	\$14.54	\$17.19	\$19.00	\$18.76	\$16.83	\$16.06	\$15.99
60	\$22.35	\$24.37	\$25.46	\$24.41	\$21.52	\$20.09	\$19.69
70	\$28.54	\$30.29	\$30.99	\$29.31	\$25.53	\$23.49	\$22.78
80	\$33.92	\$35.53	\$35.91	\$33.60	\$28.94	\$26.68	\$25.94
90	\$38.72	\$40.18	\$40.23	\$37.29	\$32.21	\$30.49	\$30.02
100	\$43.48	\$44.87	\$44.69	\$41.19	\$36.19	\$34.84	\$34.47

Under low prices and for marginal wells the Proposed system results in a better Net Cash per barrel to the investor compared to the current Alberta systems, thereby encouraging the drilling of these wells.

Table 4.105 TEXAS OIL WELL
Net Cash (\$ Cdn) per barrel

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$2.04	\$4.11	\$5.40
40			\$2.93	\$5.27	\$7.35	\$9.43	\$10.71
50	\$3.17	\$5.65	\$8.24	\$10.58	\$12.67	\$14.74	\$16.03
60	\$8.48	\$10.96	\$13.55	\$15.89	\$17.98	\$20.05	\$21.34
70	\$13.79	\$16.28	\$18.86	\$21.21	\$23.29	\$25.36	\$26.65
80	\$19.10	\$21.59	\$24.18	\$26.52	\$28.60	\$30.68	\$31.96
90	\$24.42	\$26.90	\$29.49	\$31.83	\$33.92	\$35.99	\$37.28
100	\$29.73	\$32.21	\$34.80	\$37.15	\$39.23	\$41.30	\$42.59

The Net Cash to investors is significantly more than in Texas under marginal wells with low prices, but significantly less under prolific wells.

IRR

The following maps provide for the IRR.

Table 4.078 ALBERTA TH TIER OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						14.13%	29.09%
30		5.56%	17.87%	27.03%	41.60%	78.71%	100.00%
40	37.11%	57.42%	70.40%	78.89%	100.00%	100.00%	100.00%
50	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.088 ALBERTA-NEW OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						5.79%	16.84%
30			13.22%	20.24%	29.98%	54.35%	82.39%
40	31.81%	49.42%	60.54%	66.32%	85.39%	100.00%	100.00%
50	94.29%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 4.098 ALBERTA-OLD OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			9.12%	12.18%	16.22%	28.14%	40.89%
40	30.51%	46.68%	54.38%	53.98%	62.80%	100.00%	100.00%
50	91.72%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 5.038 ALBERTA-PROPOSED OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							10.22%
30		7.39%	25.27%	34.96%	35.37%	52.09%	79.93%
40	38.37%	64.12%	92.55%	99.63%	92.00%	100.00%	100.00%
50	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	-100.00%	-100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	-100.00%	-100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-100.00%

Table 4.108 TEXAS OIL WELL
IRR (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					19.29%	59.47%	100.00%
40			22.15%	50.46%	100.00%	100.00%	100.00%
50	21.67%	46.78%	82.94%	100.00%	100.00%	100.00%	100.00%
60	73.65%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
80	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
90	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
100	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

The IRR maps confirm the fact that marginal wells under low prices would be more attractive under the Proposed system than the current Alberta systems or Texas.

PFR10

The following maps provide for the profitability ratio discounted at 10% real.

Table 4.079 ALBERTA TH TIER OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						1.05	1.22
30		0.96	1.08	1.20	1.35	1.63	1.85
40	1.20	1.35	1.51	1.64	1.82	2.16	2.41
50	1.55	1.75	1.95	2.12	2.36	2.80	3.10
60	1.90	2.15	2.40	2.61	2.91	3.45	3.83
70	2.25	2.54	2.85	3.11	3.46	4.11	4.55
80	2.60	2.94	3.30	3.60	4.01	4.77	5.27
90	2.95	3.34	3.75	4.09	4.56	5.43	5.99
100	3.30	3.73	4.19	4.58	5.11	6.08	6.71

Table 4.089 ALBERTA-NEW OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						0.94	1.09
30		0.93	1.03	1.12	1.25	1.48	1.66
40	1.17	1.31	1.45	1.56	1.71	2.01	2.22
50	1.51	1.69	1.88	2.02	2.21	2.59	2.85
60	1.85	2.07	2.31	2.49	2.73	3.21	3.52
70	2.19	2.46	2.74	2.96	3.25	3.82	4.19
80	2.53	2.84	3.17	3.43	3.77	4.44	4.86
90	2.87	3.22	3.60	3.90	4.29	5.05	5.53
100	3.21	3.61	4.03	4.38	4.82	5.67	6.20

Table 4.099 ALBERTA-OLD OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			0.99	1.03	1.09	1.24	1.37
40	1.16	1.29	1.41	1.48	1.58	1.82	1.99
50	1.50	1.67	1.84	1.94	2.08	2.39	2.61
60	1.84	2.05	2.26	2.39	2.57	2.97	3.23
70	2.18	2.43	2.69	2.85	3.06	3.54	3.84
80	2.52	2.81	3.11	3.30	3.56	4.11	4.46
90	2.86	3.19	3.53	3.76	4.05	4.69	5.08
100	3.20	3.58	3.96	4.21	4.54	5.26	5.70

Table 5.039 ALBERTA-PROPOSED OIL WELL
PFR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							1.00
30		0.98	1.15	1.27	1.33	1.49	1.66
40	1.21	1.38	1.60	1.76	1.82	2.04	2.24
50	1.56	1.79	2.03	2.20	2.26	2.52	2.76
60	1.91	2.15	2.41	2.59	2.64	2.94	3.20
70	2.18	2.45	2.74	2.94	2.98	3.29	3.56
80	2.42	2.71	3.03	3.24	3.26	3.63	3.95
90	2.63	2.95	3.29	3.50	3.53	4.05	4.46
100	2.84	3.18	3.55	3.76	3.87	4.51	5.00

The proposed system has a more attractive PFR10 for marginal wells under low prices and a less attractive PFR10 under high prices.

In general, the system will result in a rational commercial behavior because the PFR10 improves with wells that are better either because of price or because of productivity.

Table 4.109 TEXAS OIL WELL
PFR10 (real, 2007 Cdn \$)
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					1.08	1.35	1.57
40			1.09	1.29	1.54	1.93	2.22
50	1.07	1.22	1.41	1.67	2.00	2.50	2.87
60	1.31	1.49	1.73	2.05	2.46	3.08	3.52
70	1.54	1.76	2.05	2.43	2.92	3.65	4.17
80	1.78	2.03	2.37	2.82	3.38	4.23	4.82
90	2.01	2.30	2.69	3.20	3.84	4.80	5.47
100	2.25	2.57	3.01	3.58	4.30	5.38	6.13

Marginal wells under the Proposed system at low prices result in much better economics in Alberta than in Texas.

NPV10/BOE

The following maps provide the NPV10/BOE.

Table 4.080 ALBERTA TH TIER OIL WELL
NPV10/BOE
WTI
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						\$0.40	\$1.50
30		-\$0.67	\$1.15	\$2.29	\$3.41	\$4.83	\$5.71
40	\$4.04	\$6.06	\$7.24	\$7.47	\$7.91	\$8.89	\$9.51
50	\$11.06	\$12.85	\$13.54	\$13.11	\$13.07	\$13.75	\$14.19
60	\$18.09	\$19.66	\$19.89	\$18.86	\$18.38	\$18.78	\$19.06
70	\$25.12	\$26.47	\$26.24	\$24.61	\$23.69	\$23.81	\$23.93
80	\$32.15	\$33.28	\$32.59	\$30.36	\$29.00	\$28.84	\$28.80
90	\$39.18	\$40.08	\$38.94	\$36.11	\$34.31	\$33.87	\$33.67
100	\$46.21	\$46.89	\$45.29	\$41.86	\$39.62	\$38.91	\$38.54

Table 4.090
NPV10/BOE
WTI
US \$

ALBERTA-NEW OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						-\$0.44	\$0.59
30		-\$1.22	\$0.49	\$1.45	\$2.37	\$3.64	\$4.43
40	\$3.35	\$5.26	\$6.38	\$6.56	\$6.86	\$7.72	\$8.26
50	\$10.17	\$11.80	\$12.41	\$11.91	\$11.67	\$12.18	\$12.51
60	\$17.01	\$18.40	\$18.53	\$17.42	\$16.69	\$16.89	\$17.03
70	\$23.86	\$24.99	\$24.65	\$22.92	\$21.71	\$21.60	\$21.55
80	\$30.70	\$31.59	\$30.77	\$28.43	\$26.73	\$26.31	\$26.07
90	\$37.55	\$38.18	\$36.89	\$33.93	\$31.76	\$31.02	\$30.59
100	\$44.39	\$44.77	\$43.01	\$39.44	\$36.78	\$35.73	\$35.12

Table 4.100
NPV10/BOE
WTI
US \$

ALBERTA-OLD OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30			-\$0.14	\$0.34	\$0.85	\$1.86	\$2.48
40	\$3.18	\$4.98	\$5.87	\$5.65	\$5.61	\$6.25	\$6.66
50	\$9.99	\$11.52	\$11.88	\$10.96	\$10.37	\$10.65	\$10.84
60	\$16.80	\$18.06	\$17.89	\$16.27	\$15.12	\$15.04	\$15.02
70	\$23.61	\$24.59	\$23.90	\$21.58	\$19.88	\$19.44	\$19.19
80	\$30.42	\$31.13	\$29.91	\$26.89	\$24.63	\$23.83	\$23.37
90	\$37.22	\$37.66	\$35.92	\$32.20	\$29.39	\$28.23	\$27.55
100	\$44.03	\$44.20	\$41.93	\$37.51	\$34.15	\$32.62	\$31.73

Table 5.040
NPV10/BOE
WTI
US \$

ALBERTA-PROPOSED OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							\$0.02
30		-\$0.39	\$2.06	\$3.19	\$3.14	\$3.78	\$4.45
40	\$4.17	\$6.56	\$8.56	\$8.84	\$7.87	\$7.96	\$8.40
50	\$11.24	\$13.50	\$14.62	\$14.01	\$12.12	\$11.65	\$11.86
60	\$18.15	\$19.69	\$20.01	\$18.62	\$15.84	\$14.84	\$14.82
70	\$23.63	\$24.83	\$24.68	\$22.64	\$19.04	\$17.53	\$17.30
80	\$28.40	\$29.40	\$28.84	\$26.16	\$21.75	\$20.10	\$19.88
90	\$32.67	\$33.46	\$32.50	\$29.19	\$24.42	\$23.33	\$23.33
100	\$36.85	\$37.49	\$36.19	\$32.28	\$27.62	\$26.88	\$26.96

The NPV/BOE is generally better under the Proposed system for marginal wells under low prices.

Under higher prices the NPV10/BOE is actually less for prolific wells compared to marginal wells. Given the fact, that more prolific wells result in a much higher NPV10 overall, this will not result in a-commercial behavior.

Table 4.110 TEXAS OIL WELL

NPV10/BOE

WTI

US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							
30					\$0.79	\$2.68	\$3.82
40			\$1.32	\$3.37	\$5.21	\$7.09	\$8.22
50	\$1.45	\$3.71	\$5.85	\$7.84	\$9.64	\$11.49	\$12.61
60	\$6.16	\$8.35	\$10.37	\$12.30	\$14.06	\$15.90	\$17.01
70	\$10.88	\$12.98	\$14.90	\$16.76	\$18.49	\$20.30	\$21.40
80	\$15.60	\$17.62	\$19.42	\$21.22	\$22.91	\$24.71	\$25.79
90	\$20.32	\$22.26	\$23.95	\$25.68	\$27.34	\$29.11	\$30.19
100	\$25.04	\$26.89	\$28.48	\$30.14	\$31.76	\$33.52	\$34.58

The Proposed system has a much better NPV10/BOE than Texas for the marginal wells, but prolific wells result in a higher NPV10/BOE in Texas under high prices.

5.4. Maximum sustainable risk analysis for gas and oil

It is important to verify whether the proposed system for gas and for oil will be an incentive for the exploration of new pools and fields.

This can be best evaluated with the Maximum Sustainable Risk discounted at 10% real (“MSR10”).

The MSR10 can be defined as follows:

$$\text{MSR10} = \frac{\text{NPV10} + \text{D\&A Exploration expenditures @ 10\%}}{\text{D\&A Exploration expenditures @ 10\%}}$$

In this report it is assumed that the Dry & Abandoned costs of an exploration well is 80% of the capital costs that were provided in Chapter 2 for exploration and drilling and completion of the well. Bonuses and rentals are typically included in the MSR10. However, in our case, bonuses are not taken into account because they are freely biddable in Alberta. Also the rentals are very minor and not of consequence on a conventional exploration well.

The following example illustrates the calculation of the MSR10:

Assume NPV10 = \$ 600,000

Assume D&A cost of an exploration well @ 10 = \$ 300,000

$$\text{MSR10} = \frac{\$ 600,000 + \$ 300,000}{\$ 300,000} = 3.00$$

This means that an investor can carry out three exploration programs of the one that lead to the discovery and continue to make on average a risked 10% real IRR. The NPV10 already provides sufficient NPV10 to carry out two exploration programs resulting in D&A wells. However, the NPV10 is determined by already subtracting the capital expenditures of the completed well, which includes a D&A component of \$ 300,000. Therefore, this amount is added back in.

In total therefore the NPV10 is sufficient to drill three exploration wells. This means that the maximum risk that a company can run in order to maintain a 10% discount rate is 1:3. One in every three wells has to be a success in order to maintain operations and maintain a 10% discount rate. In other words the maximum risk that an explorer can run is 33.3%.

Below is the table of the Probability of Success and the corresponding MSR10.

Probability of success	MSR10	Code
100%	1.00	Red
85%	1.18	Red
75%	1.33	Green
60%	1.67	Green
50%	2.00	Cyan
40%	2.50	Cyan
33%	3.00	Yellow
25%	4.00	Yellow
20%	5.00	Yellow
15%	6.67	Yellow
10%	10.00	Yellow

Typically high risk development wells have a probability of success of 85% to 90% (“red”).

Relatively low risk new pool wells in Alberta would have a probability of success of 60% to 85% (“green”).

High risk new pool wells in Alberta would have a probability of success of 40% to 60% (“blue”)

New field wild cats in Alberta would have a probability of success of 40% or less (“gold”).

The color coding of the MSR10 therefore illustrates the type of risk an investor can take based on the fiscal terms and the economic assumptions in this report in order to make a discovery.

Gas Exploration

The following two maps compare the MSR10 for the New Gas terms and the Proposed Gas terms.

Table 5.061 ALBERTA-NEW GAS WELL
MSR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						1.09	1.54
5	1.00	1.01	1.07	1.17	1.37	1.70	2.36
6	1.41	1.42	1.50	1.62	1.89	2.33	3.20
7	1.82	1.83	1.93	2.08	2.42	2.96	4.04
8	2.23	2.24	2.36	2.54	2.95	3.59	4.87
9	2.64	2.65	2.79	3.00	3.47	4.22	5.71
10	3.06	3.06	3.22	3.46	4.00	4.85	6.55
11	3.48	3.47	3.65	3.92	4.53	5.48	7.39

Table 5.062 ALBERTA-PROPOSED GAS WELL
MSR10 (real, 2007 Cdn \$)
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3							
4						1.15	1.61
5	1.21	1.23	1.26	1.28	1.93	1.69	2.31
6	1.64	1.63	1.65	1.67	2.30	2.16	2.93
7	2.03	1.99	2.01	2.01	2.40	2.57	3.46
8	2.37	2.31	2.32	2.30	2.39	2.92	3.91
9	2.67	2.59	2.59	2.56	2.34	3.22	4.32
10	2.93	2.83	2.82	2.82	2.42	3.69	4.97
11	3.17	3.04	3.01	3.09	2.48	4.16	5.62

In the range of US \$ 6 – US \$ 7 per GJ target that may contain a well in the Cost-7 to Cost-3 range, are more attractive to explore under the Proposed terms compared to the New Gas terms. Cost-2 and Cost-1 wells are slightly less attractive under the Proposed terms. However, it should be noted that these prolific targets are attractive to explore under either system.

In general, it can therefore be concluded that the Proposed Gas system will encourage new gas pool exploration compared to the existing New Gas terms. Of course, compared to Old Gas terms, the improvement in exploration economics will even be stronger.

Oil Exploration

The following two maps compare the MSR10 for the Third Tier terms and the Proposed terms.

Table 5.063 ALBERTA TH TIER OIL WELL
MSR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20						1.07	1.28
30		0.95	1.11	1.25	1.45	1.80	2.06
40	1.26	1.46	1.66	1.82	2.04	2.46	2.77
50	1.72	1.98	2.24	2.43	2.72	3.26	3.64
60	2.18	2.51	2.82	3.06	3.42	4.09	4.55
70	2.63	3.03	3.40	3.69	4.11	4.92	5.45
80	3.09	3.55	3.98	4.32	4.81	5.75	6.36
90	3.55	4.07	4.56	4.95	5.51	6.58	7.27
100	4.00	4.59	5.14	5.58	6.21	7.41	8.17

Table 5.064 ALBERTA-PROPOSED OIL WELL
MSR10 (real, 2007 Cdn \$)

WTI US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
20							1.00
30		0.97	1.19	1.35	1.41	1.62	1.83
40	1.27	1.50	1.78	1.97	2.03	2.31	2.56
50	1.73	2.03	2.33	2.53	2.59	2.92	3.21
60	2.18	2.51	2.83	3.04	3.08	3.44	3.76
70	2.54	2.90	3.25	3.48	3.50	3.89	4.22
80	2.85	3.25	3.63	3.86	3.86	4.31	4.70
90	3.12	3.56	3.97	4.19	4.21	4.84	5.34
100	3.40	3.87	4.30	4.53	4.63	5.43	6.02

At US \$ 50 per barrel WTI the Proposed terms provide an improvement in exploration economics for wells in the Cost-7 to Cost 4 range.

At US \$ 60 per barrel WTI the economics for these wells is identical for this cost range. It should be noted, however, that under this price level all Cost-levels are in the “gold” range for both systems, except for the Cost-7 wells.

In general the proposed system will therefore continue to encourage exploration of new small low risk wells in new oil pools or even higher risk wells in new oil pools or new fields.

5.5. Summary and Conclusions

Proposed Gas terms

It is clearly possible and desirable to merge the New and Old Gas vintages into a single system of Proposed Gas terms. Under the Proposed Gas terms the royalty is based on two components: a royalty related to price plus a royalty related to volume of production per well. The details of these terms are provided in Section 5.1.

The Proposed Gas terms create a system that is clearly progressive with price and with the volume of well production.

The Proposed Gas terms would be on average about equal to the current gas terms at CL-4 and a Henry Hub price of US \$ 7 per GJ. At marginal wells with lower prices, such as a well with CL-6 and a Henry Hub price level of US \$ 5 per GJ, the royalty would be much less, in this case 11% less. For prolific wells with high prices, such as a well with CL-2 and a Henry Hub price of US \$ 9 per GJ, the royalty would be much higher, in this case 13% higher.

The Proposed Gas terms are clearly competitive with US States, such as Texas, on average. However, the structure of the government take in Alberta is radically different. Texas is regressive with price and well productivity. The Proposed Gas terms are progressive with price and well productivity. At CL-3 and for a price of US \$ 7 per GJ the systems provide for about the same overall undiscounted government take. For better wells and higher prices, the Proposed Gas terms have a higher government take, for more marginal wells and lower prices, the Proposed Gas terms have a lower government take.

The Proposed Gas terms provide for a higher level of profitability for marginal wells of CL-7 to CL-4 for the price range of US \$ 5 to US \$ 6 Henry Hub per GJ. Under these conditions, the Net Cash per barrel, IRR, PFR10 and NPV10/BOE are much improved. This means that the terms will lead to a greater intensity of gas development.

Also the MSR10 is much more attractive at these levels under the Proposed Gas terms. This means that exploration for marginal gas pools will become more attractive and will be pursued more aggressively under the new terms.

Despite the strongly progressive nature with price and well productivity, the overall system will lead to a rational commercial behavior by investors, since the marginal royalty rates are targeted to be never much over 50%, while at the same time, the PFR10 reasonably improves with better wells.

Proposed Oil terms

It is also possible to merge the terms for Third Tier Oil, New Oil and Old Oil into a single set of terms, the Proposed Oil terms. These terms are also based on a royalty consisting of two components: a royalty based on price plus a royalty based on volume per well as described in Section 5.1.

The Proposed Oil terms create a system that is clearly progressive with price and with the volume of well production. With low prices and well productivities, the new merged system resembles the Third Tier terms, while a higher well productivities the Proposed Oil terms resemble Old Oil terms. At high prices the government take increases relative to current terms.

The Proposed Oil terms would be on average about equal to the current oil terms at CL-4 and a US \$ 70 per WTI. At marginal wells with lower prices, the royalties are as much as 9% less and with more prolific wells at higher prices the royalties are as much as 13% more.

The Proposed Oil terms are also competitive with US States, such as Texas, on average. However, also for oil the structure of the government take in Alberta is different. At CL-2 and US \$ 70 per barrel, the systems of Texas and the Proposed Oil terms are about similar. For more marginal wells and lower prices, Alberta is more favorable than Texas, for more prolific wells and higher prices, Alberta is less favorable than Texas.

The Proposed Oil terms result in a level of profitability for marginal wells of CL-7 to CL-4 for the price range that is similar to Third Tier Oil in the price range of US \$ 40 to US \$ 60 per barrel. For better conditions the profitability resembles more Old Oil terms.

Also the MSR10 is similar to Third Tier Oil for marginal wells at low prices. This means that exploration for marginal oil pools will remain attractive.

The overall system will lead to a rational commercial behavior by investors. The marginal royalty rates are targeted to be never much over 50%. At the same time, the PFR10 reasonably improves with better wells across the map.

6. COAL BED METHANE, HEAVY OIL AND PRIMARY OIL SANDS OIL

In this chapter a number of comments will be made on coal bed methane and New Heavy oil terms and Primary Oil Sands Oil.

6.1. Coal Bed Methane

Alberta has coal bed methane deposits of rather different characteristics. The in-situ reserves of CBM deposits are estimated as follows:

Coal Deposit	Total (Tcf)	Crown (Tcf)	Freehold (Tcf)
Scollard (Ardley)	57	53	3
Belly River	147	107	40
Horseshoe Canyon	71	51	20
Mannville	239	188	51
Total	514	400	114

It is generally recognized that the Horseshoe Canyon CBM is dry production and is no different therefore from conventional gas.

In the Mannville formation, high levels of saline water production occur in the first phase of production. In the first year, the wells may produce primarily saline water until conditions result in the release of substantial gas from the formations. As gas production increases, the level of saline water production may become 2 or 3 barrels of water per Mcf per day. Water production may drop within four or five years from 0.5 to 1 barrels of water per day. After about 6 to 8 years water production per Mcf may become insignificant.

The water disposal is estimated to cost between \$ 0.50 and \$ 1 per barrel of saline water.

In high water-gas ratio projects water handling may be more.

Typical Mannville gas wells may produce during peak production 100 – 600 Mcf/day or comparable to the Cost-7 to Cost 4 range. The total cumulative production per well could be between 0.5 and 1 Bcf per well, or more typical of the Cost-5 to Cost-4 range.

The map provides the overview of the royalty reduction under the Proposed system per Mcf relative to New Gas terms.

Table 6.001 ALBERTA-PROPOSED GAS WELL
Royalties per Mcf relative to New Gas terms
HENRY HUB

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
3	-\$0.22	-\$0.26	-\$0.22	-\$0.14	-\$0.07	-\$0.03	-\$0.01
4	-\$0.38	-\$0.43	-\$0.37	-\$0.27	-\$0.16	-\$0.11	-\$0.08
5	-\$0.51	-\$0.50	-\$0.40	-\$0.25	-\$0.09	-\$0.01	\$0.03
6	-\$0.56	-\$0.49	-\$0.34	-\$0.13	\$0.07	\$0.18	\$0.23
7	-\$0.51	-\$0.38	-\$0.20	\$0.07	\$0.32	\$0.45	\$0.52
8	-\$0.33	-\$0.17	\$0.05	\$0.36	\$0.66	\$0.81	\$0.89
9	-\$0.06	\$0.13	\$0.38	\$0.73	\$1.07	\$1.22	\$1.29
10	\$0.30	\$0.50	\$0.79	\$1.10	\$1.34	\$1.44	\$1.49
11	\$0.73	\$0.96	\$1.28	\$1.48	\$1.61	\$1.66	\$1.69

The royalty reduction indicated on the map is for the total cumulative production on a per Mcf basis. Significant water handling costs only occur during the initial phase of the production. On this basis it seems that the royalty reduction on marginal wells under prices in the range of US \$ 6 per GJ Henry Hub, are very material compared to the water handling costs for Mannville type coal bed methane wells.

An initial impression is therefore that Mannville type coal bed methane wells with a reasonable water-gas ratio may become attractive under the Proposed Gas terms.

However, some more fiscal work on this matter may be useful in order to see whether the current limited activity in Mannville type coal bed methane could be accelerated through stronger incentives.

6.2. New Heavy Oil Terms

In order to carry out an analysis of the conventional heavy oil terms, the same oil wells as used in Chapters 4 and 5 were analyzed with prices equal to 60% of WTI. This would reflect the lower end of the price range for conventional heavy oil.

Following is a comparison of the current Alberta New Heavy Oil terms with those of the Alberta Proposed Oil terms. Maps will be displayed for the price range of US \$ 12 to US \$ 60 per barrel, which corresponds to the US \$ 20 to US \$ 100 per barrel WTI.

Gross Revenues per barrel

The gross revenues per barrel are now based on 60% WTI, but will the applicable differentials. Of course, this results in much lower gross revenues per barrel as can be seen from the map below.

Table 6.011 **ALBERTA-NEW-HEAVY** **HEAVY OIL WELL**
Gross Revenues (\$ Cdn) per barrel
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24						\$25.77	\$25.77
30			\$32.59	\$32.59	\$32.59	\$32.59	\$32.59
36	\$39.41	\$39.41	\$39.41	\$39.41	\$39.41	\$39.41	\$39.41
42	\$46.23	\$46.23	\$46.23	\$46.23	\$46.23	\$46.23	\$46.23
48	\$53.05	\$53.05	\$53.05	\$53.05	\$53.05	\$53.05	\$53.05
54	\$59.86	\$59.86	\$59.86	\$59.86	\$59.86	\$59.86	\$59.86
60	\$66.68	\$66.68	\$66.68	\$66.68	\$66.68	\$66.68	\$66.68

Total Expenditures per barrel

This map is the same as used for Alberta in Chapters 4 and 5.

Divisible Income per barrel

As can be expected the divisible income per barrel is considerably less as a result of the lower gross revenues. The black area also illustrates the area where the IRR is less than 5%. This illustrates that under current cost conditions heavy oil prices would have to be about US \$ 30 per barrel in order to make conventional heavy oil economic.

Table 6.013 **ALBERTA-NEW-HEAVY** **HEAVY OIL WELL**
Divisible Income (\$ Cdn) per barrel
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24						\$8.96	\$10.92
30			\$5.95	\$9.55	\$12.70	\$15.78	\$17.74
36	\$4.97	\$8.73	\$12.76	\$16.37	\$19.52	\$22.59	\$24.56
42	\$11.79	\$15.55	\$19.58	\$23.19	\$26.34	\$29.41	\$31.38
48	\$18.61	\$22.37	\$26.40	\$30.01	\$33.16	\$36.23	\$38.20
54	\$25.43	\$29.18	\$33.22	\$36.82	\$39.98	\$43.05	\$45.02
60	\$32.25	\$36.00	\$40.04	\$43.64	\$46.79	\$49.87	\$51.83

Government Revenues per barrel

The following two maps compare the government revenues per barrel for the two Alberta fiscal systems.

Table 6.014 **ALBERTA-NEW-HEAVY** **HEAVY OIL WELL**
Government Income + Participation per barrel (\$ Cdn)
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24						\$7.17	\$8.25
30			\$3.88	\$6.59	\$8.99	\$10.95	\$12.23
36	\$2.39	\$3.99	\$6.36	\$9.41	\$12.11	\$14.29	\$15.72
42	\$4.57	\$6.26	\$8.83	\$12.23	\$15.24	\$17.63	\$19.20
48	\$6.76	\$8.53	\$11.31	\$15.04	\$18.36	\$20.98	\$22.69
54	\$8.95	\$10.80	\$13.78	\$17.86	\$21.48	\$24.32	\$26.17
60	\$11.14	\$13.08	\$16.25	\$20.68	\$24.60	\$27.66	\$29.66

Table 6.034 **ALBERTA-PROPOSED** **HEAVY OIL WELL**
Government Income + Participation per barrel (\$ Cdn)
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24				\$1.52	\$4.08	\$6.19	\$7.37
30		\$0.63	\$1.84	\$4.00	\$7.11	\$9.61	\$10.97
36	\$1.57	\$2.68	\$4.01	\$6.63	\$10.32	\$13.21	\$14.78
42	\$3.61	\$4.73	\$6.30	\$9.45	\$13.73	\$17.03	\$18.79
48	\$5.66	\$6.77	\$8.81	\$12.47	\$17.35	\$21.05	\$23.02
54	\$7.70	\$9.01	\$11.54	\$15.71	\$21.19	\$25.30	\$27.47
60	\$9.90	\$11.64	\$14.58	\$19.23	\$25.28	\$29.78	\$32.14

The Proposed system for oil provides generally for somewhat lower Government Revenues per barrel, except under high price conditions for high productivity wells.

Royalties per barrel

The following two maps compare the royalties per barrel.

Table 6.016		ALBERTA-NEW-HEAVY			HEAVY OIL WELL			
Royalties/BOE								
Heavy								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12		\$0.16	\$0.25	\$0.47	\$0.85	\$1.18	\$1.42	\$1.58
18		\$0.43	\$0.68	\$1.29	\$2.32	\$3.23	\$3.89	\$4.33
24		\$0.70	\$1.11	\$2.10	\$3.78	\$5.28	\$6.36	\$7.07
30		\$0.97	\$1.54	\$2.92	\$5.26	\$7.34	\$8.84	\$9.82
36		\$1.17	\$1.87	\$3.54	\$6.37	\$8.89	\$10.69	\$11.89
42		\$1.37	\$2.19	\$4.15	\$7.47	\$10.42	\$12.54	\$13.95
48		\$1.58	\$2.52	\$4.76	\$8.57	\$11.96	\$14.39	\$16.00
54		\$1.78	\$2.84	\$5.37	\$9.67	\$13.50	\$16.24	\$18.06
60		\$1.98	\$3.16	\$5.98	\$10.77	\$15.04	\$18.09	\$20.12

Table 6.036		ALBERTA-PROPOSED			HEAVY OIL WELL			
Royalties/BOE								
Heavy								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12		\$0.00	\$0.00	\$0.00	\$0.22	\$1.16	\$1.88	\$2.24
18		\$0.00	\$0.00	\$0.00	\$0.48	\$2.08	\$3.29	\$3.89
24		\$0.00	\$0.00	\$0.00	\$0.94	\$3.25	\$4.97	\$5.81
30		\$0.00	\$0.00	\$0.00	\$1.56	\$4.66	\$6.92	\$8.03
36		\$0.00	\$0.00	\$0.18	\$2.40	\$6.32	\$9.15	\$10.55
42		\$0.00	\$0.00	\$0.53	\$3.49	\$8.27	\$11.68	\$13.36
48		\$0.00	\$0.00	\$1.19	\$4.89	\$10.52	\$14.51	\$16.48
54		\$0.00	\$0.28	\$2.17	\$6.60	\$13.09	\$17.65	\$19.91
60		\$0.21	\$1.10	\$3.60	\$8.70	\$16.00	\$21.13	\$23.67

The royalties per barrel are zero for most price levels for the Cost-7 and Cost-6 wells under the Proposed terms. For high productivity wells under high prices, the royalties per barrel are higher.

Royalty rates

Following two maps provide the comparative royalty rates.

Table 6.017 ALBERTA-NEW-HEAVY HEAVY OIL WELL

Royalty Rate
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24						24.67%	27.43%
30			8.97%	16.14%	22.53%	27.11%	30.15%
36	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%
42	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%
48	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%
54	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%
60	2.97%	4.74%	8.98%	16.15%	22.55%	27.13%	30.17%

Table 6.037 ALBERTA-PROPOSED HEAVY OIL WELL

Royalty Rate
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24				3.65%	12.60%	19.27%	22.55%
30		0.00%	0.00%	4.78%	14.29%	21.23%	24.65%
36	0.00%	0.00%	0.47%	6.08%	16.03%	23.21%	26.76%
42	0.00%	0.00%	1.15%	7.56%	17.89%	25.26%	28.91%
48	0.00%	0.00%	2.25%	9.21%	19.83%	27.35%	31.07%
54	0.00%	0.46%	3.63%	11.03%	21.86%	29.49%	33.26%
60	0.32%	1.66%	5.39%	13.05%	24.00%	31.68%	35.49%

The Proposed system provides zero royalty rates for wells in the Cost-7 to Cost 6 range for most prices. These are wells starting production at 8 to 14 barrels per day. It seems entirely justified to have zero royalties for such low productivity wells producing heavy oil. Relatively prolific wells pay considerable royalties under the entire price range, as is the case under current New Heavy terms.

The following map illustrates the difference in royalty rates between the Proposed system and the current New Heavy Oil system.

Table 6.044
Royalty differential- compared with New Heavy
Heavy

US \$	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24				-11.03%	-7.90%	-5.40%	-4.88%
30		-4.74%	-8.97%	-11.35%	-8.24%	-5.88%	-5.49%
36	-2.97%	-4.74%	-8.51%	-10.07%	-6.52%	-3.93%	-3.41%
42	-2.97%	-4.74%	-7.83%	-8.60%	-4.66%	-1.88%	-1.26%
48	-2.97%	-4.74%	-6.73%	-6.94%	-2.72%	0.21%	0.90%
54	-2.97%	-4.28%	-5.34%	-5.12%	-0.69%	2.35%	3.10%
60	-2.65%	-3.09%	-3.58%	-3.10%	1.45%	4.55%	5.32%

As can be seen from the map, the Proposed system results in lower rates, except for the very prolific wells under high prices.

In general, therefore, the Proposed system should be a strong incentive for the production of conventional heavy oil wells.

Undiscounted government take (real)

The following two maps provide the overview of the undiscounted government take.

Table 6.018 **ALBERTA-NEW-HEAVY** **HEAVY OIL WELL**
Undiscounted Government Take (Income only)

Heavy	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
US \$							
12							
18							
24						80.02%	75.54%
30			65.28%	69.01%	70.75%	69.40%	68.91%
36	47.98%	45.69%	49.81%	57.50%	62.06%	63.27%	63.99%
42	38.79%	40.27%	45.10%	52.74%	57.84%	59.96%	61.20%
48	36.33%	38.15%	42.82%	50.14%	55.36%	57.89%	59.40%
54	35.19%	37.02%	41.48%	48.50%	53.73%	56.48%	58.14%
60	34.53%	36.32%	40.59%	47.38%	52.57%	55.46%	57.22%

Table 6.038 ALBERTA-PROPOSED HEAVY OIL WELL
Undiscounted Government Take (Income only)
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24				55.73%	69.26%	69.14%	67.49%
30		33.22%	30.88%	41.89%	55.95%	60.90%	61.85%
36	31.49%	30.71%	31.42%	40.53%	52.84%	58.47%	60.16%
42	30.63%	30.40%	32.16%	40.74%	52.12%	57.89%	59.89%
48	30.40%	30.28%	33.36%	41.55%	52.32%	58.11%	60.28%
54	30.29%	30.88%	34.74%	42.68%	53.01%	58.77%	61.03%
60	30.70%	32.32%	36.42%	44.06%	54.02%	59.72%	62.01%

The current Alberta New Heavy Oil terms are strongly regressive with price. As was discussed before for Non Heavy Oil, the reason is that the formula's for New Heavy Oil are now outdated and the select price is no longer at a level that makes sense in the current price framework. The current system is still strongly progressive with well productivity, providing for a much higher overall government take at higher well productivities.

Under the Proposed terms the system becomes slightly price progressive which the system remains strongly progressive with well productivity. The Proposed system provides much stronger downside protection under low price conditions.

5% Discounted government take (real)

The following two maps provide the 5% discounted government take on a real basis.

Table 6.019 ALBERTA-NEW-HEAVY HEAVY OIL WELL
5% Discounted Government Take (Income only)
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24						87.05%	80.27%
30			77.13%	76.73%	76.29%	73.09%	71.73%
36	58.53%	50.37%	53.61%	61.33%	65.40%	65.78%	66.00%
42	41.71%	42.42%	47.35%	55.36%	60.32%	61.93%	62.80%
48	37.98%	39.55%	44.45%	52.19%	57.39%	59.55%	60.75%
54	36.34%	38.07%	42.78%	50.22%	55.47%	57.95%	59.34%
60	35.42%	37.16%	41.69%	48.88%	54.13%	56.78%	58.31%

Table 6.039 ALBERTA-PROPOSED HEAVY OIL WELL
5% Discounted Government Take (Income only)
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24				79.55%	81.36%	75.82%	72.03%
30		54.71%	33.91%	45.73%	60.67%	64.56%	64.62%
36	36.88%	32.90%	32.83%	42.87%	56.07%	61.21%	62.29%
42	32.50%	31.54%	33.22%	42.61%	54.74%	60.20%	61.69%
48	31.53%	31.05%	34.31%	43.20%	54.63%	60.17%	61.88%
54	31.10%	31.53%	35.66%	44.21%	55.12%	60.67%	62.49%
60	31.37%	32.98%	37.32%	45.50%	55.99%	61.49%	63.37%

The heavy oil terms for both the New Heavy terms and the Proposed terms are considerably front end loaded due to the fact that the royalty rates are related to well productivity and the wells are assumed to decline in production.

Net Cash per barrel

The following two maps provide the Net Cash per barrel.

Table 6.015 ALBERTA-NEW-HEAVY HEAVY OIL WELL
Net Cash (\$ Cdn) per barrel
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24						\$1.79	\$2.67
30			\$2.06	\$2.96	\$3.72	\$4.83	\$5.52
36	\$2.59	\$4.74	\$6.41	\$6.96	\$7.41	\$8.30	\$8.84
42	\$7.22	\$9.29	\$10.75	\$10.96	\$11.10	\$11.78	\$12.18
48	\$11.85	\$13.83	\$15.10	\$14.96	\$14.80	\$15.25	\$15.51
54	\$16.48	\$18.38	\$19.44	\$18.96	\$18.50	\$18.73	\$18.84
60	\$21.11	\$22.93	\$23.78	\$22.96	\$22.19	\$22.21	\$22.18

Table 6.035		ALBERTA-PROPOSED			HEAVY OIL WELL			
Net Cash (\$ Cdn) per barrel								
Heavy								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12								
18								
24					\$1.21	\$1.81	\$2.76	\$3.55
30			\$1.28	\$4.11	\$5.55	\$5.60	\$6.17	\$6.77
36	\$3.41	\$6.05	\$8.75	\$9.74	\$9.21	\$9.38	\$9.78	
42	\$8.18	\$10.82	\$13.28	\$13.74	\$12.61	\$12.38	\$12.58	
48	\$12.95	\$15.59	\$17.59	\$17.54	\$15.81	\$15.18	\$15.17	
54	\$17.73	\$20.17	\$21.68	\$21.11	\$18.79	\$17.75	\$17.54	
60	\$22.35	\$24.37	\$25.46	\$24.41	\$21.52	\$20.09	\$19.69	

The maps illustrate how the Proposed system would result in a significant improvement of economics at the critical US \$ 30 to US \$ 36 per barrel of heavy oil (corresponding with US \$ 50 to US \$ 60 per barrel WTI). Yet, the Proposed system does not result in significant profitability and heavy oil wells remain relatively marginal at these prices from a net cash point of view.

IRR

Following two maps display the IRR.

Table 6.020		ALBERTA-NEW-HEAVY			HEAVY OIL WELL			
IRR (real, 2007 Cdn \$)								
Heavy								
US \$		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12								
18								
24							13.00%	23.55%
30				11.16%	16.09%	22.72%	40.11%	59.39%
36	13.56%	27.74%	37.46%	41.84%	52.85%	89.56%	100.00%	
42	41.68%	61.24%	72.50%	77.35%	98.79%	100.00%	100.00%	
48	78.74%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
54	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Table 6.040		ALBERTA-PROPOSED			HEAVY OIL WELL			
IRR (real, 2007 Cdn \$)								
Heavy		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
US \$								
12								
18								
24					7.18%	10.60%	19.72%	32.03%
30			7.39%	25.27%	34.96%	35.37%	52.09%	79.93%
36	18.50%	38.15%	61.21%	69.79%	66.18%	99.81%	100.00%	100.00%
42	49.72%	79.83%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
48	92.65%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
54	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
60	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

The IRR maps confirm the considerable improvement in economics in the US \$ 30 to US \$ 36 per barrel of heavy oil range.

PFR10

The following two maps provide the PFR10 overview.

Table 6.021		ALBERTA-NEW-HEAVY			HEAVY OIL WELL			
PFR10 (real, 2007 Cdn \$)								
Heavy		COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
US \$								
12								
18								
24							1.04	1.17
30				1.01	1.08	1.17	1.36	1.51
36	1.03	1.15	1.27	1.36	1.48	1.73	1.92	1.92
42	1.23	1.38	1.53	1.64	1.79	2.10	2.32	2.32
48	1.44	1.61	1.79	1.93	2.11	2.47	2.72	2.72
54	1.64	1.84	2.05	2.21	2.42	2.84	3.12	3.12
60	1.85	2.07	2.31	2.49	2.73	3.21	3.52	3.52

Table 6.041 ALBERTA-PROPOSED HEAVY OIL WELL
PFR10 (real, 2007 Cdn \$)
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24				0.97	1.01	1.14	1.27
30		0.98	1.15	1.27	1.33	1.49	1.66
36	1.07	1.22	1.42	1.57	1.63	1.83	2.02
42	1.28	1.46	1.69	1.85	1.91	2.14	2.35
48	1.49	1.71	1.95	2.11	2.17	2.43	2.66
54	1.70	1.94	2.19	2.36	2.42	2.70	2.94
60	1.91	2.15	2.41	2.59	2.64	2.94	3.20

The PFR10 confirms the considerable improvement in profitability in the US \$ 30 to US \$ 36 per barrel heavy oil range. This improvement in economics is important, since this may unlock a new effort to pursue relatively marginal conventional heavy oil wells. A large share of the remaining conventional oil resources in Alberta are heavy oils.

The PFR10 also confirms that better wells result in a higher PFR10. Therefore, the fiscal terms will induce a rational commercial behavior.

NPV10/BOE

The following two maps illustrate the NPV10/BOE.

Table 6.023 ALBERTA-NEW-HEAVY HEAVY OIL WELL
NPV10/BOE
Heavy
US \$

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24						\$0.32	\$1.17
30			\$0.18	\$0.90	\$1.62	\$2.76	\$3.47
36	\$0.59	\$2.57	\$3.85	\$4.20	\$4.63	\$5.58	\$6.18
42	\$4.69	\$6.53	\$7.52	\$7.51	\$7.65	\$8.41	\$8.89
48	\$8.80	\$10.48	\$11.19	\$10.81	\$10.66	\$11.23	\$11.60
54	\$12.91	\$14.44	\$14.86	\$14.11	\$13.67	\$14.06	\$14.32
60	\$17.01	\$18.40	\$18.53	\$17.42	\$16.69	\$16.89	\$17.03

Table 6.043
NPV10/BOE
Heavy
US \$

ALBERTA-PROPOSED

HEAVY OIL WELL

	COST-7	COST-6	COST-5	COST-4	COST-3	COST-2	COST-1
12							
18							
24				-\$0.39	\$0.08	\$1.05	\$1.85
30		-\$0.39	\$2.06	\$3.19	\$3.14	\$3.78	\$4.45
36	\$1.35	\$3.78	\$6.00	\$6.64	\$6.04	\$6.35	\$6.88
42	\$5.59	\$7.95	\$9.82	\$9.92	\$8.76	\$8.74	\$9.13
48	\$9.83	\$12.11	\$13.44	\$13.02	\$11.31	\$10.95	\$11.20
54	\$14.07	\$16.08	\$16.86	\$15.93	\$13.67	\$12.99	\$13.10
60	\$18.15	\$19.69	\$20.01	\$18.62	\$15.84	\$14.84	\$14.82

The NPV10/BOE confirms the significant improvement in profitability at the US \$ 30 to US \$ 36 per barrel heavy oil price range.

Under the proposed system the NPV10/BOE typically goes up with better wells. However, for very high prices, more productive wells result in a lower NPV10/BOE. Given the rational PFR10 behavior this is unlikely to result in a-commercial behavior.

Conclusion

In general the Proposed system for Oil seems to fit very well with the economics of the conventional heavy oil wells. It does not seem that a separate system is necessary. Therefore, it can be recommended to merge the New Heavy Oil terms with the Proposed system.

The Proposed terms will strongly encourage conventional heavy oil drilling compared to the current New Heavy terms. This is important, since much of the conventional oil is heavy.

Despite, the strong new incentive, the Proposed terms do not result in unusual profits under any price level, since the contrary to the New Heavy terms, the Proposed system is price progressive as well as progressive with well productivity.

6.3. Primary Oil Sand Oil terms

Currently, there are 47 primary oil sand projects. These are projects that produce oil from the same formations as the oil sand projects, but the “primary” oil actually flows to the wells.

The primary projects are subject to the Oil Sands fiscal terms, although producers can opt to apply the conventional terms.

Of the 47 projects, 16 are in pre-payout and pay 1% of gross, while 31 are in post-payout and pay 25% of net profits. In total 24 project produce less than 1000 bopd.

Total production is 129,000 bopd. In 2005 the average royalty was Can \$ 2.62 per barrel or Can \$ 123.5 million in total.

In total there are about 4500 wells in production and therefore the average well production is about 30 barrels per day, or equivalent to a CL-5.

About 12 project produce 75% of the primary oil sands oil and pay almost all the royalties and have higher well productivities, more equivalent to CL-4 and CL-3.

From Table 6.036 illustrating the royalties per barrel under the proposed system, the average royalty per barrel for a CL-4 well would range from \$ 1.54 to \$ 2.40 per barrel in the price range of US \$ 30 to US \$ 36 per barrel of heavy oil. A CL-3 well would pay \$ 4.66 to \$ 6.32 per barrel.

Given these statistics, it can be recommended to convert the Primary Oil Sands Oil projects to the Proposed system for conventional oil. This would greatly reduce administrative difficulties and would at the same time provide an encouragement for the current low productivity projects to enhance recovery.

7. ROYALTY PROGRAMS

With the significant improvements for marginal wells included under the Proposed Oil terms and the Proposed Gas terms, it is now possible to review the various royalty programs.

7.1. Conventional Oil royalty programs

Following are brief comments on each of the programs.

Horizontal Re-entry

This program was aimed at encouraging horizontal drilling. This program is being phased out. There does not seem to be a reason to re-consider this decision under the Proposed Oil terms.

Re-activation of wells

This program relates to the re-activation of wells that were earlier suspended or abandoned wells. With the considerably improved terms for marginal wells, resulting in zero royalties under low and average prices, there does not seem to be any rationale for this program. It can therefore be recommended to terminate this program under the Proposed Oil terms, also with respect to wells already under the program.

Low Productivity Wells

The new Proposed Oil terms are specifically aimed at making low productivity wells more attractive to the investor. Therefore, it can be recommended to terminate this program under the Proposed Oil terms, also with respect to wells already under the program.

3rd Tier Exploratory Program

Table 5.063 and 5.064 in Section 5.4 of this report illustrate how the Proposed Oil terms result in an improvement of the MSR10 under prices of less than US \$ 60 per barrel.

At US \$ 60 per barrel, the MSR10 is amply sufficient to justify the drilling of relatively high risk new pool exploratory wells.

Given these economics it does not seem necessary to maintain a special support program. It can therefore be recommended that as part of the Proposed Oil terms, this program be terminated, including for wells for which the program was already granted.

7.2. Experimental, EOR, CO2 and IETP Oil programs.

The Proposed Oil terms do not impact on the experimental, EOR, CO2 or IETP programs. These programs have broader objectives than making marginal wells economically attractive.

7.3. Gas royalty programs

Deep Gas Royalty Holiday

The Proposed Gas terms do provide for a considerable improvement in terms for low productivity wells. As a result the drilling of deep wells will result in less risk. In case low productivity wells are being discovered the lesser royalties help making the well as attractive as possible.

Under the Proposed Gas terms, wells with high productivity result in higher royalties. Deep wells require often high productivity in order to be economic. As a result, the Proposed Gas terms may not deal effectively with deep gas wells.

A matter that needs therefore further investigation is whether there would be a benefit in having a third variable in the royalty formula dealing with well depth.

Sulphur emission control assistance

It is the understanding that this program is being phased out.

Otherwise Flared Solution Gas Royalty Waiver.

The significant improvements in royalty terms for marginal gas production will also make associated gas production more economic. It is therefore likely that less waivers will be required in the future.