THE DUVERNAY SHALE
THE NEW MILLENNIUM GOLD IS CONDENSATE

BMO CAPITAL MARKETS OIL & GAS A&D ADVISORY

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BMO Capital Markets®
The Duvernay Shale

- Since our last publication on the Duvernay, "The New Millennium Gold Rush" (March 2012), investment in the Duvernay has focused on land acquisition in the Edson and Pembina areas, land consolidation primarily at Kaybob and drilling and evaluation in all three areas.

- Drilling activity has exposed land positions previously held under broker’s names and the significant land holdings of international oil companies and senior Canadian producers has become apparent.

- Drilling results over the last 18 months have confirmed the existence of multiple phase windows (dry gas, liquid-rich gas, volatile oil and black oil), as well as confirming the ability of the reservoir to behave as a true, overpressured shale reservoir and, from most windows, deliver hydrocarbons economically.

- More recent drilling activity is now focused in the areas where free condensate production is significant, resulting in enhanced economics given current commodity pricing.

- The Alberta Royalty Regime favours Duvernay gas wells over Duvernay oil wells which suggests activity at least in the near term will be relegated to defining and drilling in the condensate and NGL-rich windows.

- It is with this continued investment that the Duvernay Shale has emerged as a highly sought after, world-class unconventional shale play, with focus now on condensate - the new gold.

### North American Shale Plays

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Duvernay</th>
<th>Eagle Ford</th>
<th>Montney</th>
<th>Marcellus</th>
<th>Haynesville (Cotton Valley)</th>
<th>Muskwa (Horn River)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (m)</td>
<td>2500-4000</td>
<td>2000-4000</td>
<td>1900-3000</td>
<td>1400-2200</td>
<td>2500-4000</td>
<td>2500-3000</td>
</tr>
<tr>
<td>Thickness (m)</td>
<td>20-70</td>
<td>10-70</td>
<td>200-350</td>
<td>30-60</td>
<td>50-100</td>
<td>150</td>
</tr>
<tr>
<td>Porosity (%)</td>
<td>4-10</td>
<td>6-14</td>
<td>3-7</td>
<td>3-9</td>
<td>8-12</td>
<td>3-7</td>
</tr>
<tr>
<td>TOC (weight %)</td>
<td>2-7</td>
<td>2-6</td>
<td>2-5</td>
<td>3-10</td>
<td>1-5</td>
<td>2-6</td>
</tr>
<tr>
<td>Fracability</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Gradient (psi/ft)</td>
<td>0.7-0.9</td>
<td>0.55-0.75</td>
<td>0.55-0.75</td>
<td>0.4-0.7</td>
<td>0.8-0.95</td>
<td>0.5-0.7</td>
</tr>
<tr>
<td>Liquid Yield (bbl/MMcfe)</td>
<td>up to 450</td>
<td>up to 600</td>
<td>up to 50</td>
<td>up to 50</td>
<td>up to 50</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Producing Phase Windows</td>
<td>Oil Dry-Gas</td>
<td>Oil Wet-Gas</td>
<td>Wet-Gas Dry-Gas</td>
<td>Wet-Gas Dry-Gas</td>
<td>Wet-Gas Dry-Gas</td>
<td>Dry-Gas</td>
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</tbody>
</table>


### Shale Gas Resource Play - Report Card

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Remarks</th>
<th>Duvernay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huge Rock Volume</td>
<td>thick porous, regionally extensive and predictable</td>
<td>![ ]</td>
</tr>
<tr>
<td>Fracable</td>
<td>quartz and calcite rich, clay-poor, brittle rocks, fracs easily, introduces permeability</td>
<td>![ ]</td>
</tr>
<tr>
<td>High TOC Organically Mature</td>
<td>organically rich, Type II Kerogen, self-sourced, thermally mature, extensive volatile-oil and liquid-rich gas windows</td>
<td>![ ]</td>
</tr>
<tr>
<td>Overpressured</td>
<td>increases storage of hydrocarbons, improves deliverability and well clean-up, provides drive in multi-phase hydrocarbon system</td>
<td>![ ]</td>
</tr>
</tbody>
</table>
As indicated in the Shale Gas Report Card on the previous page, the combination of several critical factors is necessary to create a world-class resource like the Duvernay.

- The Duvernay has substantial rock volume that is thick (> 30 m), porous and regionally extensive covering an estimated 7,500 sq miles. In our last report, BMO estimated the gas in place to be as high as 750 Tcf.
- In October of 2012, the ERCB (AER) estimated that the Duvernay gas in place (P50 case), was 443 Tcf with a further 73 billion bbl of NGLs and oil.
- The regional cross section shows the extent of the Duvernay from Kaybob down through Edson, Pembina and finally into the East Shale Basin confirming the areal extent of the reservoir.
- BMO has had the opportunity to examine core across the fairway with the core photos confirming the Duvernay is an organically rich source rock. This is further supported by an ever-expanding set of geochemical analyses where TOC can be as high as 20% but is typically in the 2-7% range.
- Deliverability is dependent on rock brittleness and the effectiveness of mechanically induced fractures. Duvernay rock components are dominated by quartz and calcite with very little clay, making the rock brittle – note the healed fracture systems observed in core photos.
- Other remaining reservoir characteristics that are key to a successful shale play include reservoir pressure and specifically high pressure gradients as well as the thermal maturity of the fairway.

**Duvernay Shale Basin Lithofacies Map**

- **Huge Rock Volume**
- **Fracable**

Source: WCSB Atlas fig 12.17, GeoSCOUT, BMO Capital Markets

Schematic adapted from Potma et al. 2001
Regionally Extensive and Thick  Significant Gas and Liquids in Place

Regional Stratigraphic Cross Section - 337 km of Duvernay from Kaybob to East Shale Basin

Source: GeoSCOUT, BMO Capital Markets, Core descriptors are from visual observations
Overpressured and Thermally Mature

- Pressure data reveals significant overpressuring in the Duvernay. This is a beneficial attribute to have in this permeability challenged, liquid-rich reservoir as it increases overall storage and deliverability.

- With few exceptions, pressure gradients are above 0.6 psi/ft, with the bulk clustering at 0.8 psi/ft.

- With overpressuring, there is a longer period for single phase flow within the reservoir which will assist with the overall capture of reserves.

- The Duvernay thermal maturity map uses historical and new geochemistry data, supplemented with actual test and production results.

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**Overpressured Duvernay Across the Basin**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Duvernay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overpressured</td>
<td>![Star]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth (metres)</th>
<th>Pressure (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6,000</td>
<td>4,000</td>
</tr>
<tr>
<td>12,000</td>
<td>8,000</td>
</tr>
<tr>
<td>18,000</td>
<td>12,000</td>
</tr>
</tbody>
</table>

01-20-038-28W4
East Shale Basin
EOG Horizontal

02-08-044-27W4
East Shale Basin
Normally Pressured

16-05-062-24W5
Kaybob
Encana Horizontal

**Duvernay Thermal Maturity**

- Most of the wells drilled to date lie within the volatile-oil and liquid-rich gas windows; these regions (pressure plus liquids) are the most sought after areas of the fairway.

- Although there are NGLs in the gas stream, it is the free-condensate that is currently driving the enhanced play economics, with some operators reporting condensate yields up to 560 bbl/MMcf.

- The consequence is that operators are very focused on tracking the liquids which results in detailed definition of the phase windows and expected yields, as is evident at Kaybob.

- The highest condensate yields are found in the volatile oil and rich gas phase windows, indicated in the gold and green on the map.

Source: GeoSCOUT, BMO Capital Markets
Characterizations of phase windows are not subject to hard and fast rules and can show a fair amount of overlap.

Highest condensate yields come from gas streams with high C7+ component ratios within the volatile oil and rich gas phase windows.

Understanding and predicting the C7+ ends requires gas plus liquids recombination analyses, which are rare in public data.

The hypothetical gas compositions shown below model condensate gas ratios of 100 and 300 bbl/MMcf, reflecting C7+ compositions of 5% and 15% respectively.

Wells with either of these condensate yields will be economic, but obviously the 300 bbl/MMcf well, combined with high pressure gradients provides superior deliverability and economics.

Recent industry activity has been focused on following the liquids and in turn providing definition for the phase windows.
Duvernay Players

Active players in the Duvernay are those with multi-billion dollar market caps. Deep pockets and financial staying power are pre requisites for participation. The table on the right details the major players in the Canadian Duvernay play fairway with the top eight drillers having a market cap of more than $10B (CDN). These same operators account for 74% of the drilling undertaken to date in the play.

Several of these players are new entrants (Sinopec/Exxon), having completed corporate acquisitions (Daylight/Celtic) to gain their entry into this world-class shale play.

All players noted have a significant land position in the play, with the table detailing land positions that have been disclosed to the public. These land totals may still underestimate positions, as a considerable amount of land remains held on a confidential basis by brokers. Very little open Crown remains in the play, particularly in Kaybob, leading to ongoing consolidation activity through acquisition.

Expect to see more drilling, especially in Kaybob, to retain lands. Recall that much of the land was purchased as four year licenses, which by drilling will convert to leases with another five years of term. This will be critical for lands originally bought in 2009 and 2010.

A number of companies have disclosed the intent to seek potential partners as a way to develop the play more quickly, including Talisman and Sinopec-Daylight with Encana previously announcing a joint venture with PetroChina on their Duvernay acreage.

Since 2010 Duvernay well activity has increased exponentially. In 2013 almost 130 wells have been licensed, with 57 wells drilled or drilling this year. Activity on undrilled licenses will likely pick up once the ground freezes in the fall and winter drilling can begin.

Shell is the front runner when it comes to Duvernay drills and licenses, accounting for more than 30% of the wells to date. Many wells drilled during last winter’s drilling season will come off confidential status in the coming months and that is likely to be a catalyst for additional activity.

### Duvernay Players

<table>
<thead>
<tr>
<th>Market Cap (B$Cdn)</th>
<th>Disclosed Land Position (net sections)</th>
<th>Strike Areas</th>
<th>Drilled or Drilling (well count by operator)</th>
<th>Undrilled Licenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exxon (XTO/Celtic)</td>
<td>400</td>
<td>169</td>
<td>Kaybob</td>
<td>16</td>
</tr>
<tr>
<td>Chevron (Alta Energy)</td>
<td>230</td>
<td>508</td>
<td>Kaybob</td>
<td>20</td>
</tr>
<tr>
<td>Shell</td>
<td>220</td>
<td>225</td>
<td>Kaybob, Pembina</td>
<td>46</td>
</tr>
<tr>
<td>Sinopec Daylight</td>
<td>105</td>
<td>203</td>
<td>Pembina</td>
<td>5</td>
</tr>
<tr>
<td>ConocoPhillips</td>
<td>89</td>
<td>n/a</td>
<td>Pembina</td>
<td>5</td>
</tr>
<tr>
<td>EOG</td>
<td>48</td>
<td>155</td>
<td>Kaybob, East Shale Basin</td>
<td>3</td>
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<tr>
<td>Apache</td>
<td>39</td>
<td>n/a</td>
<td>Kaybob</td>
<td>1</td>
</tr>
<tr>
<td>Canadian Natural</td>
<td>36</td>
<td>623</td>
<td>Edson</td>
<td>2</td>
</tr>
<tr>
<td>Husky</td>
<td>29</td>
<td>86</td>
<td>Kaybob</td>
<td>12</td>
</tr>
<tr>
<td>Encana - Phoenix JV</td>
<td>14</td>
<td>695</td>
<td>Kaybob, Pembina</td>
<td>29</td>
</tr>
<tr>
<td>Talisman</td>
<td>13</td>
<td>563</td>
<td>Kaybob, Pembina</td>
<td>8</td>
</tr>
<tr>
<td>Vermillion</td>
<td>6</td>
<td>321</td>
<td>Edson</td>
<td>3</td>
</tr>
<tr>
<td>Enerplus</td>
<td>4</td>
<td>133</td>
<td>Pembina</td>
<td>3</td>
</tr>
<tr>
<td>PennWest</td>
<td>4</td>
<td>156</td>
<td>Pembina, Edson</td>
<td>1</td>
</tr>
<tr>
<td>Trilogy</td>
<td>4</td>
<td>207</td>
<td>Kaybob</td>
<td>8</td>
</tr>
<tr>
<td>Athabasca Oil</td>
<td>3</td>
<td>550</td>
<td>Kaybob</td>
<td>12</td>
</tr>
<tr>
<td>Yoho</td>
<td>0.2</td>
<td>22</td>
<td>Kaybob</td>
<td>4</td>
</tr>
<tr>
<td>Others:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Swan</td>
<td>n/a</td>
<td>201</td>
<td>Pembina, Edson</td>
<td>2</td>
</tr>
<tr>
<td>Bounty</td>
<td>n/a</td>
<td>200</td>
<td>Kaybob, Pembina</td>
<td>12</td>
</tr>
<tr>
<td>Other Minor Players</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total Industry Activity</td>
<td>194</td>
<td>76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Market Cap as at Nov 7, 2013
2. Publicly announced as seeking some form of transaction

Source: BMO Capital Markets

### Duvernay Activity

- Licensed
- Drilled or Drilling
- Percentage of wells from BIG-CAP* operators

AER License data to November 15, 2013

* BIG-CAP operators have market cap $10B

Source: BMO Capital Markets
Duvernay Drilling History

Honing in on the Free Condensate Fairway

- Prior to 2012, data on the Duvernay fairway was limited which resulted in broad interpretation of thermal maturity boundaries. During the initial rush to acquire land, companies paid premium prices for large land licenses within the Ro boundaries.
- The majority of land licenses, including the most expensive, were contained in the wet-gas fairway as defined by the data available at the time.
- The first Duvernay drills targeting this fairway at Kaybob and Pembina were drilled by Celtic (XTO), Encana, Husky, Talisman and Trilogy.
- One-off Duvernay drills are expensive ($15MM+) and many of the wells were drilled by companies with deep pockets and large market caps. The Duvernay fairway has developed substantially as the knowledge base increased.
- The liquid-rich boundaries have been refined and are constantly being evaluated as new wells are drilled and data is made available.
- More recently, Kaybob has seen an explosion of drilling activity, principally from the large market cap companies.

Source: GeoEDGES, GeoSCOUT, BMO Capital Markets
Duvernay lands at Kaybob are very tightly held
To gain a foothold in this prime area, several companies have made large acquisitions. Exxon has purchased Celtic, creating XTO Energy Canada while Chevron has purchased Alta Energy
Major land holders at Kaybob include Athabasca, Chevron, Encana, Shell, Talisman and Trilogy
There are currently 53 producing wells at Kaybob - 50 are horizontal
Length of the horizontal leg varies from ~1 km to just over 2 km and the number and type of fracs vary as operators transition from evaluation wells into development wells
Shell, Husky and Encana are good examples of this as they transition from single well licenses to multi-well pad licenses and drilling, with Shell leading the way
Publicly available free condensate production from these wells is reported to be as high as 560 bbl/MMcf
Operators are exploring closer towards the volatile oil window in a search for increased condensate yield
A larger number of wells are still confidential, with major operators routinely trading confidential data amongst themselves to increase their competitive advantage
The definition of the phase boundaries continues to evolve as operators release test and production data
Kaybob Drilling Results  Striking Gold

- An increase in the quantity and quality of production data leads to sweet spot identification and more accurate predictions of liquid and condensate yields
- With more than 50 new licenses in addition to the wells that will soon come off confidential, 2014 will be an interesting year for the Duvernay at Kaybob
- Encana estimates it will spend $250-$350MM ($500 to $600MM including JV) on Duvernay activity, including operating six to eight rigs, pad drilling at Kaybob and completing appraisal work at Willesden Green (DOB, Nov 5, 2013)
- Chevron notes “…Near term plans include transitioning to a two-rig drilling program” (DOB, Oct 25, 2013)
- Trilogy is planning to spend $150MM to drill approximately 11 net wells in the Duvernay (DOB, November 11, 2013)
- Apache Corporation plans on a winter 2013/2014 spud date for its first Duvernay well

Source: Various corporate presentations and press releases, GeoEDGES, GeoSCOUT, BMO Capital Markets
Edson Development Appears Stalled

Edson Activity Map

- The least active of the three main Duvernay fairway areas, Edson has seen some recent drilling but with no production results reported east of the Leduc trend.
- Several large long tenure licenses are held in the area by land brokers and until wells are licensed on these blocks, it is difficult to know who owns them.
- Edson players include Bellatrix, Black Swan, Canadian Natural and Vermilion: Bellatrix has increased their Duvernay position with the acquisition of Angle Energy.

- The underlying Swan Hills Platform edge trends through the area, impacting Duvernay thickness and possibly reservoir quality.
- BMO viewed core from the 01-10-052-17W5 Canadian Natural well located close to the edge of the Swan Hills platform.
- While finely laminated, the rock itself was coarser than those cores viewed at Pembina and Kaybob. As well, the core was very sticky and bituminous.
- The characteristics displayed by this core provide clues as to why development has been slow at Edson. The release of new data from the three confidential wells (Vermilion and Black Swan) is eagerly anticipated and will help to fill in some of the blanks.

Edson Activity Map

- Bellatrix (old Angle well) 100/04-36-052-17W5/00 Drilled and cased
- Canadian Natural 102/10-35-050-13W5/00 WELL CONFIDENTIAL UNTIL 2013/12/16
- Vermilion 100/15-18-049-13W5/00 WELL CONFIDENTIAL UNTIL 2014/02/05
- Black Swan 100/14-28-048-12W5/02 WELL CONFIDENTIAL UNTIL 2014/03/13

Edson Players Land Map

- Very bituminous core
- Pyrite easily visible
- Siltstone to VF sandstone
- No fossils observed

Source: Various corporate presentations and press releases, GeoSCOUT, BMO Capital Markets
Land positions at Pembina were secured early, long before drilling began. PNG rights are now largely held in the prime parts of the Duvernay fairway, and as a result future sale parcel size will be smaller.

Large land positions are held by Encana, Enerplus, PennWest and Talisman. Although there are fewer players, they have larger land positions.

Access to this play is largely limited to acquisition of another company, farm-in or joint venture. Encana entered into a joint venture with Phoenix, a wholly owned subsidiary of PetroChina, to explore and develop their extensive Duvernay holdings here and at Kaybob.

The second most active area for drilling in the Duvernay, Pembina currently has 13 producing horizontal wells and 10 horizontal standing wells.

Shell, Encana/PetroChina and Talisman are the most active drillers at Pembina with a combined 38 wells.

Pembina Duvernay is overpressured like Kaybob, typically greater than 0.7 psi/ft.

Early results show free condensate ranges from 8 to 130 bbl/MMcf.

Many wells will be coming off confidential in the next few months which will provide much needed data and clarity towards phase window definition and especially condensate yield.
Developing a Type Well Forecast

More than 70 Duvernay wells have reported production to September 2013 with the vast majority being in the Kaybob area, with many of these wells reporting production as confidential (volumes only) making it more difficult to create an average type well.

However Trilogy has published a type well in Kaybob based on the producer at 03-13-060-20W5. This well is one of the longest producing with 29 months of production, an IP of 4 MMcf/d and forecasted recoverable reserves of 4 Bcf of gas with BMO estimating condensate capture based on the average 80 bbl/MMcf observed in the 03-13 well.

The 03-13 well had 12 fracture treatments (slickwater 200 ton/stage hybrid). However, as drilling transitions from evaluation to development, the horizontal legs will increase in length and will have a higher fracture treatment density.

The Trilogy type well was then scaled to 16 fracs (to better reflect the current drilling), creating a 30 day IP of 5.1 MMcf/d and an EUR of 5.3 Bcf with 429 Mbbl of condensate. This is still considered conservative when compared with reported results from operators.

*Calculated deep-cut yields
## Robust Returns Driven by Condensate

### Production Rate and NPV

- **IP 5.1 MMcf/d**
- **Cond 80 bbl/MMcf**
- **NGLs 53 bbl/MMcf**

### Type Well Sensitivities

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Price Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Cond Yield (bbl/MMcf)</td>
<td>$0 - $15</td>
</tr>
<tr>
<td>30 Day IP (MMcf/d raw)</td>
<td>$4 - $12</td>
</tr>
<tr>
<td>Condensate Price ($/bbl)</td>
<td>$3 - $6</td>
</tr>
<tr>
<td>Capital ($MM)</td>
<td>$4 - $12</td>
</tr>
<tr>
<td>EUR (Bcf raw)</td>
<td>$3 - $7</td>
</tr>
</tbody>
</table>

**Source:** BMO Capital Markets

### Economics Summary

<table>
<thead>
<tr>
<th>Type Well</th>
<th>Company Interest</th>
<th>Total Production</th>
<th>Net Present Value (BTax)</th>
<th>Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duvernay Type-Well</td>
<td>429</td>
<td>4,706</td>
<td>1,498</td>
<td>$15.3 MM</td>
</tr>
<tr>
<td></td>
<td>4,706</td>
<td>286</td>
<td>1,498</td>
<td>$11.6 MM</td>
</tr>
<tr>
<td></td>
<td>4,706</td>
<td>286</td>
<td>1,498</td>
<td>$9.2 MM</td>
</tr>
<tr>
<td></td>
<td>4,706</td>
<td>286</td>
<td>1,498</td>
<td>79%</td>
</tr>
</tbody>
</table>

Economics run on $4/GJ (Gas) and $100/bbl (Cond) Price Forecast. Effective date of Jan 1, 2014

- **Discounted Payout**: 10%
- **60% of Total NPV@10%**
- **End of Royalty Program**
- **EUR 5.3 Bcf (raw)**
- **Cond 429 Mbbl**
- **NGLs (deep-cut) 286 Mbbl**

**Source:** BMO Capital Markets

- Sensitivities were run on several factors which cover production, reserves, costs and pricing scenarios. NPV is most sensitive to variations in free condensate yield and the least sensitive to changes in ultimate recovery.
- As plant NGLs have lesser value than free condensate, varying NGLs in the same proportion as condensate has far less impact on the value of the well.
- The hunt continues in each area to maximize condensate deliverability with the expectation that as condensate and liquid ratios increase, corresponding gas deliverability will decrease.
- Given that there is growing demand for condensate in Western Canada, as it is used primarily as diluent for the growing oil sands industry, the relatively high pricing (~7% premium to Edmonton Light Oil) should remain robust for the foreseeable future.

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**Type Well Sensitivities**: NPV@10% = $15.3MM, RoR = 79%

- Free Cond Yield (bbl/MMcf): $0 - $15
- 30 Day IP (MMcf/d raw): $4 - $12
- Condensate Price ($/bbl): $3 - $6
- Capital ($MM): $4 - $12
- Gas Price ($/GJ): $3 - $6
- EUR (Bcf raw): $3 - $7

**Source:** BMO Capital Markets
The type well economics show that liquid-rich Duvernay gas wells are profitable and that the condensate has the greatest impact on value.

This has led to operators pushing the play boundaries further into the oily phase window on their quest for higher condensate yields.

**Are the ultra high condensate yields from true gas wells?**

*The government has broad definitions on what differentiates a gas well from an oil well where the true classification requires a PVT analysis of the produced fluids. Ultimately, the government will designate the final status.*

*Oil wells may be subject to maximum rate limitations or GOR penalties which do not apply to gas wells. Further, oil wells do not have the same level of royalty relief as deep gas wells.*

*To explore this effect, the type gas well was evaluated as an oil well (using the same rates and costs).*

*Somewhat surprisingly, the gas well has much better economics, valued at $15.3MM (NPV@10%) to the oil well’s $11.1MM (NPV@10%).*

*The oil well uses up its royalty benefit in less than six months compared to 60 months for the gas well. Further, the gas well pays out in less than 18 months compared to over two years for the oil well.*

*Even with current commodity prices, the type well is better off being designated as a gas well.*

*This will become much more important as the play expands into the oilier areas.*

<table>
<thead>
<tr>
<th>Type Well</th>
<th>Net Present Value (BTax) @10% ($MM)</th>
<th>Net Present Value (BTax) @15% ($MM)</th>
<th>Net Present Value (BTax) @20% ($MM)</th>
<th>Rate of Return (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duvernay Gas Well</td>
<td>$15.3</td>
<td>$11.6</td>
<td>$9.2</td>
<td>79%</td>
</tr>
<tr>
<td>Duvernay Oil Well</td>
<td>$11.1</td>
<td>$7.6</td>
<td>$5.4</td>
<td>50%</td>
</tr>
<tr>
<td>Difference from Gas</td>
<td>-$4.2</td>
<td>-$4.0</td>
<td>-$3.8</td>
<td>-29%</td>
</tr>
</tbody>
</table>

Economics run on $4/GJ (Gas) and $100/bbl (Cond) Price Forecast. Effective date of Jan 1, 2014.
Move to Consolidate into the Sweet Spots

- Since 2010, operators have rushed to secure land positions in the Duvernay fairway, spending billions at Crown Land Sales, and leasing in on freehold owners. All coloured blocks on the map reflect held Duvernay rights and emphasize that the lands are very tightly held. The only option for new players is to acquire or joint venture.

- Several major property transactions have occurred as the main players seek to consolidate and expand their acreage position.

- Shell, the most active Duvernay operator, expanded its position with corporate acquisition of B&G, and property transactions with Sonde and Petrobakken. Shell’s acreage spans the entire Duvernay liquid-rich fairway.

- Encana announced a $2.2B joint venture with PetroChina to explore and develop its Duvernay assets in late 2012. Encana has re-stated their commitment to the liquid-rich Duvernay, after the recent company shake-up.

- Exxon acquired Celtic Exploration for $2.6B in late 2012. XTO Canada Ltd., a wholly owned Exxon subsidiary, is very actively developing the assets at Kaybob.

- Chevron greatly expanded their Duvernay position at Kaybob with the corporate acquisition of Alta Energy Partners in August 2013 for a rumoured $1.0B.

- Bellatrix Exploration, a Cardium player with Duvernay assets, recently acquired Angle Energy for $576MM. Angle’s Duvernay acreage at Edson compliments the Bellatrix existing acreage at Pembina.

Source: Various corporate presentations and press releases, GeoSCOUT, BMO Capital Markets.
What to Watch for

At Kaybob

- The move from exploration to development in the high condensate area of the liquid-rich fairway
- Infrastructure and gas processing developments as more liquid-rich gas comes on stream
- Continued consolidation in the sweet spots (condensate rich areas) and in particular the results of the Athabasca offering and Talisman’s joint venture
- Release of confidential data from last winter’s drilling season, particularly wells testing the condensate limits by Shell (04-25-064-20W5, 12-04-064-17W5) ConocoPhillips (16-24-063-17W5) and Chevron (01-11-063-24W5)
- Watch for consistent condensate ratios as the wells produce over time
- Land retention drilling

At Edson

- Release of confidential data from drilling by Vermilion (10-35-050-13W5, 15-18-049-13W5) and Black Swan (14-28-048-12W5) – key will be which phase windows are present
- Note that drilling licenses here have long tenure and we do not expect any land retention drilling

At Pembina

- Release of confidential data, particularly wells drilled by Talisman (03-06-042-5W5), Encana (02-35-041-07W5) and Shell (03-21-040-07W5), which will reduce uncertainty related to positioning of the phase windows
- Exposure of Shell’s true land position
- Consolidation of lands in the preferred phase windows and in particular the results of Talisman’s joint venture and PennWest’s offering
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