Canada’s Natural Gas Production
(Bcf/d Adapted from CAPP Data)

- **Record Prices**
- **Record Activity**
- Production flat to declining
- Not Sustainable

Production Growth controlled by pipeline capacity
Does not mean there is nothing left to Explore and Develop!

• 39/119 Gas Play Areas have shown growth in production in past 5 years + CBM (Horseshoe Canyon and Mannville)
  – Accelerating production
  – Real growth *but* adding little value
  – Real growth *and* adding value

• Differentiating real growth from acceleration vital for companies and investors seeking long term success in a mature basin
Growth Plays

• ‘Conventional’ plays in less accessible areas

• ‘Unconventional’ plays in many different areas of the Basin
  – “More challenging to produce”
  – ‘Unconventional’ plays are in many cases a lower quality version of ‘Conventional’ Plays
Unconventional Gas Production WCSB
December 2004  (Raw Gas Mmcf/d)

Unconventional Production 33%, Activity 50%
“The Unconventional has become Conventional”

Source: PetroCube, 2005
WCSB Gas Production by Area
Change in production 2000-2005

Source: PetroCube, 2005
Number of Plays per Area showing Production Growth 2005 vs 2000

- <2 Growing Plays
- 2-3 Growing Plays
- >3 Growing Plays

Jean Marie Carbonate Resource Play
Deep Basin Multi-zone stacked clastics
Horseshoe Canyon Coalbed Methane
Milk River Shallow gas

Source: PetroCube, 2005
Jean Marie – Upper Devonian
Gas charged, low permeability carbonate shelf with sporadic ‘sweet spots’ due to patch reefs or fracturing
NE BC Gas – Production to May 2004

Source: PetroCube, 2004
NE BC Gas – Production to December 2004

Source: PetroCube, 2005
Jean Marie/Kakisa Production & Well Count

Jean Marie Production and Well Count

Producing Well Count

Production Mcf/d
Jean Marie - Resource Play

• Average Well:
  – Depth: 4300’ (1300m)
  – Initial Productivity = 1.4Mmcf/d,
  – Estimated Ultimate Reserves = 0.9Bcf
  – Well costs (D&C): $1.6MM (Horizontal Well)
  – Chance of Success: 62%

• Factors leading to emergence of play
  – Under-balanced horizontal drilling,
  – Steering of horizontal wells
  – Development of infrastructure
  – Improved operating environment in NEBC

• Leading operators:
  – Encana, CNRL, Penn West, Devon
Deep Basin – Jurassic/Cretaceous
Gas charged, multizone, clastics (equivalent to BCG)

Jean Marie Carbonate Resource Play

Deep Basin Multi-zone stacked clastics

Horseshoe Canyon Coalbed Methane

Milk River Shallow gas

Source: PetroCube, 2005
Deep Basin Gas

Production History By Group

Source: PetroCube, 2005
Deep Basin Gas

• Average Well:
  – Depth: 8000’ (2400m)
  – IP = Up to 2.2Mmcf/d (per zone)
  – EUR = Up to 1.5Bcf (per zone)
  – Average 1.4 completions per well bore
  – Typical well costs: $1.6MM
  – Chance of Success: >80%

• Factors leading to growth of play
  – Improved fracture technology,
  – Ability to commingle production from many zones
  – Down-spacing of wells

• Leading operators:
  – Burlington, Devon, Talisman, BP
Horseshoe Canyon CBM - Upper Cretaceous
Shallow, dry Coalbed methane play

Jean Marie Carbonate Resource Play

Deep Basin Multi-zone stacked clastics

Horseshoe Canyon Coalbed Methane

Milk River Shallow gas

Source: PetroCube, 2005
Central Alberta Gas
Horseshoe Canyon CBM Production and well Count to March 2005

138Mmcf/d (1550 wells) + 40Mmcf/d (384 Confidential wells)

Source: AJM Data
Horseshoe Canyon CBM

• Average Well
  – Depth: 1800’ (550m)
  – IP = 100mcf/d,
  – EUR = 250Mmcf(?)
  – Typical well costs: $255k (Drill and Complete)
  – Chance of Success: 90%

• Factors leading to emergence of play
  – Import of CBM technology from USA,
  – Produces gas with no water
  – Existing production infrastructure, Low pressure gas lines

• Leading operators:
  – MGV, Apache, Encana, Trident etc.
Milk River Shallow Gas – Upper Cretaceous
Shallow biogenic gas in shaly, distal, marine sands

Jean Marie Carbonate Resource Play

Deep Basin Multi-zone stacked clastics

Horseshoe Canyon Coalbed Methane

Milk River Shallow gas

Source: PetroCube, 2005
Saskatchewan Gas

Source: PetroCube, 2005
Milk River Shallow Gas, Saskatchewan

• Average Well
  – Depth 425m
  – IP = 291mcf/d
  – EUR = 0.284Bcf
  – Typical well costs: $150K Drill & Complete
  – Chance of Success: 95%

• Factors leading to emergence of play
  – Rank exploration to expand proven shallow gas play area of SE Alberta/SW Saskatchewan
  – ‘Assembly line’ drilling, completion and tie-in to minimise costs

• Leading operators:
  – Profico, Husky, Devon, Paramount
## Comparison of Opportunities

<table>
<thead>
<tr>
<th>Location</th>
<th>Average Depth</th>
<th>Well Cost</th>
<th>Chance of Success</th>
<th>Initial Productivity Per well</th>
<th>Ultimate Reserve Per well</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia Jean Marie Carbonate</td>
<td>4300’</td>
<td>$1,600,000 (Horizontal)</td>
<td>60%</td>
<td>1.4Mmcf/d</td>
<td>0.9Bcf</td>
</tr>
<tr>
<td>Alberta/BC Deep Basin Multi-zone Clastics</td>
<td>8000’</td>
<td>$1,600,000</td>
<td>&gt;80%</td>
<td>Up to 2.2Mmcf/d per zone</td>
<td>Up to 1.5Bcf per zone</td>
</tr>
<tr>
<td>Alberta Horseshoe Canyon CBM</td>
<td>1800’</td>
<td>$255,000</td>
<td>90%</td>
<td>0.1Mmcf/d</td>
<td>?</td>
</tr>
<tr>
<td>Saskatchewan Shallow gas</td>
<td>1400’</td>
<td>$150,000</td>
<td>95%</td>
<td>0.29Mmcf/d</td>
<td>0.28Bcf</td>
</tr>
</tbody>
</table>

Source: PetroCube, 2005
Other Recent Gas Successes

- **Groundbirch**
  - Duvernay, Doig Trend
  - >250Bcf

- **Monkman**
  - Talisman, Paleozoic
  - 50+Mmcf/d per well

- **Cutbank Ridge**
  - Encana, Cadomin
  - Resource Play

- **Tay River (Ricinus)**
  - Shell, Leduc Discovery
  - 500+Bcf OGIP

Source: PetroCube, 2005
Conclusions

• There are still opportunities for growth and adding value in the WCSB

• Unconventional gas is the present and the future

• There is no ‘right’ decision

• Need to understand the risks and rewards of different strategies

• Corporate expectations and strengths must match realities of Basin

• The WCSB is rapidly changing: complete, consistent and up-to-date statistical information is vital
For more information:
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www.ajma.net

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Thank You