EnCAID approval # 10440J
Performance presentation

AER Offices | Calgary | March 2014

www.cenovus.com
Advisory

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## Strong integrated oil portfolio

**TSX, NYSE | CVE**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise value</td>
<td>$27 billion</td>
</tr>
<tr>
<td>Shares outstanding</td>
<td>756 MM</td>
</tr>
</tbody>
</table>

**2013F production**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil &amp; NGLs</td>
<td>181 Mmbls/d</td>
</tr>
<tr>
<td>Natural gas</td>
<td>525 MMcf/d</td>
</tr>
</tbody>
</table>

**2012 proved & probable reserves**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 BBOE</td>
</tr>
</tbody>
</table>

**Bitumen**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic contingent resources*</td>
</tr>
<tr>
<td>Discovered bitumen initially in place*</td>
</tr>
<tr>
<td>Lease rights**</td>
</tr>
</tbody>
</table>

**P&NG rights**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5 MM net acres</td>
</tr>
</tbody>
</table>

**Refining capacity**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>229 Mmbls/d</td>
</tr>
</tbody>
</table>

Values are approximate. Forecast production based on midpoints of the October 24, 2013 guidance document. Cenovus land at December 31, 2012 have been updated to reflect the divestiture of the Shaunavon asset in southern Saskatchewan. *See advisory. **Includes an additional 0.5 million net acres of exclusive lease rights to lease on our behalf and our assignee’s behalf.
EnCAID*
Introduction and Overview

This presentation was prepared in accordance with AER Directive 054 - Performance Presentations, Auditing, and Surveillance of In Situ Oil Sands Schemes

Subsurface Issues Related to Resource Evaluation and Recovery
  • Directive 054, Section 3.1.1

Surface Operations, Compliance, and Issues Not Related to Resource Evaluation and Recovery
  • Directive 054, Section 3.1.2

* Canadian patent CA2594413
AER Dir 054 Section 3.1.1

Subsurface issues related to resource evaluation and recovery
Subsurface issues: Table of contents

1. Scheme background
2. Geology / geoscience
3. Drilling and completions
4. Instrumentation
5. Scheme performance
6. Future plans
Scheme background

Subsurface section 1

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Background

- The EnCAID project is an enhanced recovery scheme which displaces natural gas with combustion gases that are the result of combustion of residual bitumen in gas cap.
Project overview

- Combustion of residual bitumen in gas cap
- Allows for displacement and re-pressurization of gas zone
- 100% Cenovus Energy
Geological / geoscience

Subsurface section 2

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## Summary of reservoir properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth</td>
<td>465 TVD</td>
</tr>
<tr>
<td>Thickness</td>
<td>5 m</td>
</tr>
<tr>
<td>Average Porosity</td>
<td>~36%</td>
</tr>
<tr>
<td>Average Gas Saturation</td>
<td>~50%</td>
</tr>
<tr>
<td>Average Water Saturation</td>
<td>~30%</td>
</tr>
<tr>
<td>Average Bitumen Saturation</td>
<td>~20%</td>
</tr>
</tbody>
</table>
Wabiskaw stratigraphic cross-section
Drilling and completions

Subsurface section 3

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Well layout
Drilling and completions

- No new wells were drilled
- No recompletions
- No workovers

Requirements under subsection 3.1.1 3c – wellbore schematics are included in the Appendix
Instrumentation

Subsurface section 4

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Instrumentation in wells

- Observation Well: 102/05-10-73-6W4
  - Equipped with 3 piezometers
  - Equipped with 10 thermocouples

- Observation Well: 100/6-10-73-6W4
  - Equipped with 1 piezometer
  - Equipped with 10 thermocouples

- Requirements under subsection 3.1.1 5a – wellbore schematics, 5c and 5d are included in the Appendix
Observation wells bitumen pressure
Scheme performance

Subsurface section 5

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## Project performance history

<table>
<thead>
<tr>
<th>Year</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>June - Ignition and start-up</td>
</tr>
</tbody>
</table>
| 2007 | Q1 – Nitrogen response at 00/14-9-73-6W4/00  
Q2 – Nitrogen response at 00/2-16-73-6W4/00, 00/11-15-73-6W4/00, Shut-in 00/14-9-73-6W4/00 |
| 2008 | May – Nitrogen response at 00/1-17-73-6W4/00 |
| 2009 | Jan – Gas production shut-in due to 00/6-18-73-6W4/00 segregation repair  
Jun – Nitrogen response at 00/7-8-73-6W4/00  
Oct – Injectivity decrease observed |
| 2010 | Q1– 00/5-10-73-6W4/00 injector stimulation treatment  
Q4 – Shut-in 00/1-17-73-6W4/00, 00/2-16-73-6W4/00, 00/11-15-73-6W4/00. Removal of 00/5-10-73-6W4/00 thermocouple string and perform pressure fall off tests |
| 2011 | Q1 - 00/5-10-73-6W4/00 injector stimulation treatment  
Mar/Apr – 00/11-15-73-6W4/00 flowed N₂ 85% |
| 2012 | Jul – Startup of 00/6-7-76-6W4/00  
Oct – Primrose sales volumes flowing to Caribou gas facility |
| 2013 | Feb - Startup of 00/6-6-73-6W4/00  
Mar- Shut-in 00/7-8-73-6W4/00 |
## Production/injection summary

### Production Operations

<table>
<thead>
<tr>
<th>Operating For</th>
<th>Air Injected</th>
<th>Bulk Gas Recovered</th>
<th>Formation Gas Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;7 years</td>
<td>~ 183 e^6m^3</td>
<td>~ 128 e^6m^3</td>
<td>~ 110 e^6m^3</td>
</tr>
</tbody>
</table>

### Approved Producers

<table>
<thead>
<tr>
<th>UWI</th>
<th>Status</th>
<th>UWI</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>00/06-05-073-06W4/0</td>
<td>Flowing ~ 12% N\textsubscript{2}</td>
<td>00/02-16-073-06W4/0</td>
<td>Shut-in ~ 82% N\textsubscript{2}</td>
</tr>
<tr>
<td>00/06-06-073-06W4/2</td>
<td>Flowing &lt;1% N\textsubscript{2}</td>
<td>00/01-17-073-06W4/0</td>
<td>Shut-in ~ 88% N\textsubscript{2}</td>
</tr>
<tr>
<td>00/06-07-073-06W4/2</td>
<td>Flowing &lt;1% N\textsubscript{2}</td>
<td>00/10-11-073-07W4/0</td>
<td>Shut-in</td>
</tr>
<tr>
<td>00/07-08-073-06W4/0</td>
<td>Shut-in ~ 75% N\textsubscript{2}</td>
<td>00/10-12-073-07W4/0</td>
<td>Shut-in</td>
</tr>
<tr>
<td>00/11-15-073-06W4/0</td>
<td>Shut-in ~ 74% N\textsubscript{2}</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
K3 pool production

7-8 Rate ~4 e3m3/d
SI May due to high N2

6-7 Rate ~13 e3m3/d

6-6 Rate ~5 e3m3/d
Producing March 2013

6-5 Rate ~13 e3m3/d

Injection Well

SI K1 or L3 Pool
Historical production

Cumulative Gas Produced during EnCAID in e3m3

Net Formation Gas Produced  Bulk Gas Removed  Linear (Net Formation Gas Produced)
Voidage replacement ratio (VRR) - 2013

January and mid-November
- Steady air injection rates
- Minor downtime due to weather related events

Mid-November to early December
- Mechanical issues restricted air injection capability
- Minor downtime due to weather events

Balance of December
- Steady air injection rate
## Voidage replacement ratio (VRR)

<table>
<thead>
<tr>
<th></th>
<th>Monthly VRR</th>
<th>Cumulative VRR</th>
<th>VRR Regulatory Approved Limits Min Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>2.54</td>
<td>1.35</td>
<td>0.90</td>
</tr>
<tr>
<td>February</td>
<td>2.38</td>
<td>1.36</td>
<td>0.90</td>
</tr>
<tr>
<td>March</td>
<td>2.48</td>
<td>1.37</td>
<td>0.90</td>
</tr>
<tr>
<td>April</td>
<td>2.32</td>
<td>1.37</td>
<td>0.90</td>
</tr>
<tr>
<td>May</td>
<td>2.70</td>
<td>1.38</td>
<td>0.90</td>
</tr>
<tr>
<td>June</td>
<td>2.62</td>
<td>1.39</td>
<td>0.90</td>
</tr>
<tr>
<td>July</td>
<td>2.85</td>
<td>1.40</td>
<td>0.90</td>
</tr>
<tr>
<td>August</td>
<td>2.70</td>
<td>1.41</td>
<td>0.90</td>
</tr>
<tr>
<td>September</td>
<td>2.65</td>
<td>1.42</td>
<td>0.90</td>
</tr>
<tr>
<td>October</td>
<td>2.71</td>
<td>1.43</td>
<td>0.90</td>
</tr>
<tr>
<td>November</td>
<td>2.18</td>
<td>1.44</td>
<td>0.90</td>
</tr>
<tr>
<td>December</td>
<td>2.34</td>
<td>1.44</td>
<td>0.90</td>
</tr>
<tr>
<td>2013 Average</td>
<td>2.54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VRR performance

- AER VRR Targets:
  - Monthly Min 0.9
  - Annual Min 1.0
  - Cumulative 1.1 to 2.0

- 2013 YTD Average VRR ~ 2.5

- Monthly VRR over due to Production shut-in

- Weather related reductions

- Nov 2012 Monthly VRR limit removed

- Injectivity Problems

- Compressor Mechanical Issue

- Monthly Air/Gas Ratio

- Cumulative Air/Gas Ratio
VRR historical
K3 pool pressure

![Graph showing K3 pool pressure over time with key events and ERB Approval Minimum Pressure at 700 kPa.](image)

- **Average Wabiskaw Pool Pressure**
- **Linear (Average Wabiskaw Pool Pressure)**

**Events:**
- **GOB Shut-In** Sept 2003
- **Start of EnCAID Air Injection** June 2nd, 2006
102/05-10-073-06W4 – Temperature history
Observation well temperature

102/05-10-073-06W4 Observation well temperature
Observation well temperature

100/06-10-073-06W4 Observation well temperature
Composition of injected/produced fluids

- EnCAID does not currently sample air injected
- EnCAID captures gas samples for analysis on the schedule located to the right and monitors compositional changes for each well
- Cenovus samples selective wells on more frequent basis then required under Approval 10440J

<table>
<thead>
<tr>
<th>Location</th>
<th>Min Approval Sampling Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>00/6-10-73-6W4/2</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/6-5-73-6W4/0</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/6-6-73-6W4/2</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/6-7-73-6W4/2</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/7-8-73-6W4/0</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/11-15-73-6W4/0</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/2-16-73-6W4/0</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/1-17-73-6W4/0</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/10-11-73-7W4/0</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/10-12-73-7W4/0</td>
<td>Semi- annual</td>
</tr>
<tr>
<td>00/6-18-73-6w4/0</td>
<td>Annual</td>
</tr>
<tr>
<td>00/10-36-72-7W4/2</td>
<td>Annual</td>
</tr>
<tr>
<td>00/11-17-73-6W4/0</td>
<td>Annual</td>
</tr>
<tr>
<td>00/14-9-73-6W4/0</td>
<td>Annual</td>
</tr>
</tbody>
</table>
Nitrogen response

7-8 Hz
14-9 Hz
11-15 Hz
2-21 K1
Pool

73-7W4
4% N2
<1% N2
6-6
10-11
10-12
6-7
6-18

74% N2
<1% N2
<1% N2
6-5

76% N2
87% N2
83% N2
87% N2

73-6W4
86% N2
12% N2
<1% N2
<1% N2

<1% N2
<1% N2
6-18

76% N2
4% N2
6-6

Injection Well
SI K1 or L3 Pool

K1 – K3 Boundary

www.cenovus.com
Gas composition 00/1-17-73-6W4/0
Gas composition 00/2-16-73-6W4/0
Gas composition 00/6-5-73-6W4/0
Gas composition 00/6-7-73-6W4/0
Gas composition 00/7-8-73-6W4/0
Gas composition 00/11-15-73-6W4/0
Gas composition 00/14-9-73-6W4/0
Gas composition 00/6-18-73-6W4/0
K-3 Pool Material Balance

Original Pressure – 2050 kPaa (300 psia)

Pressure Dec 03 = 662 kPaa or 96 psia
OGIP = 1129 e6m³ (39.9 Bcf)
Gas prod = 877 e6m³ (31.0 Bcf 77% RF)
Post-EnCAID RF ~ 85 - 87%

Dec 31/2013
Cum Prod 35.5 (Bulk Gas) Bcf RF ~89%
Ultimate recovery dependent on well performance and project run time
Current estimate ~90% RF (36 Bcf)
Subsurface key learnings

• Maintaining continuous air injection is key to maintaining steady combustion front

• Nitrogen effects on produced gas must be monitored on an ongoing basis and forecasted for future impacts on plant operations and gas sales quality

• Recognize value of thermocouple data for predication and history matching simulations

• Generation of thermal conductive heating into the bitumen

• Provides a process for recovering gas that would otherwise not be recoverable due to GOB shut-in
Future plans

Subsurface section 6

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Future plans

• No changes in overall recovery strategy are planned at this time

• No drilling activities are planned at this time
AER Dir 054 Section 3.1.2

Surface operations, compliance and issues not related to resource evaluation and recovery
Surface operations: Table of contents

1. Facility overview / modifications
2. Measurement and reporting
3. Environmental issues
4. Compliance statement
5. Future plans
Facility overview / modifications

Surface section 1

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Site layout
Process flow schematic
Plant performance - 2013

• January to mid-November
  • Steady air injections
  • Some weather related reductions

• Mid-November to early December
  • Mechanical issue with one compressor reduced air injections by half

• Early December to year end
  • Resumption of steady air injections

• Facility is operating as expected
Gas usage

<table>
<thead>
<tr>
<th></th>
<th>2013 (e³m³/d)</th>
<th>2012 (e³m³/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>4.78</td>
<td>3.93</td>
</tr>
<tr>
<td>February</td>
<td>4.50</td>
<td>4.39</td>
</tr>
<tr>
<td>March</td>
<td>5.07</td>
<td>4.27</td>
</tr>
<tr>
<td>April</td>
<td>5.19</td>
<td>4.31</td>
</tr>
<tr>
<td>May</td>
<td>5.19</td>
<td>3.33</td>
</tr>
<tr>
<td>June</td>
<td>5.32</td>
<td>2.20</td>
</tr>
<tr>
<td>July</td>
<td>5.33</td>
<td>3.14</td>
</tr>
<tr>
<td>August</td>
<td>5.70</td>
<td>4.03</td>
</tr>
<tr>
<td>September</td>
<td>5.67</td>
<td>4.27</td>
</tr>
<tr>
<td>October</td>
<td>5.90</td>
<td>3.97</td>
</tr>
<tr>
<td>November</td>
<td>4.82</td>
<td>4.28</td>
</tr>
<tr>
<td>December</td>
<td>4.85</td>
<td>4.87</td>
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</tbody>
</table>
Gas usage
## Green house gas emissions

<table>
<thead>
<tr>
<th></th>
<th>2013 (tonne)</th>
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</thead>
<tbody>
<tr>
<td>January</td>
<td>325.31</td>
</tr>
<tr>
<td>February</td>
<td>275.08</td>
</tr>
<tr>
<td>March</td>
<td>342.11</td>
</tr>
<tr>
<td>April</td>
<td>340.36</td>
</tr>
<tr>
<td>May</td>
<td>350.62</td>
</tr>
<tr>
<td>June</td>
<td>348.87</td>
</tr>
<tr>
<td>July</td>
<td>360.88</td>
</tr>
<tr>
<td>August</td>
<td>385.98</td>
</tr>
<tr>
<td>September</td>
<td>371.34</td>
</tr>
<tr>
<td>October</td>
<td>399.29</td>
</tr>
<tr>
<td>November</td>
<td>315.26</td>
</tr>
<tr>
<td>December</td>
<td>341.90</td>
</tr>
</tbody>
</table>
# Surface gas migration

<table>
<thead>
<tr>
<th>Year</th>
<th>Observations</th>
</tr>
</thead>
</table>
| 2005 | No development yet at EnCAID site, set base line  
Existing tied-in gas leases at 14-9, 11-15, 6-10, 5-10 and standing well 4-15 |
| 2006 | LEL disappeared when went to “methane elimination mode” which is standard practice for these tests |
| 2007 | LEL detection in “Full Gas Detection Mode” disappeared in “Methane Elimination Mode” suggesting “swamp gas”  
Test company noted that clay cap over most of the sites could be trapping methane from organic peat decomposition |
| 2008 | Collected low pressure gas samples for analysis at 5-10 & 11-15.. Most tests confirmed “biogenic” gas  
Added additional sampling points(8/lease) under the clay cap on 5-10, 6-10 & 11-15 to better define trapping effects |
| 2009 | SDS concluded that in their opinion it is a biogenic gas/swamp gas problem  
Single Sample above 100% LEL came from a wet, sloppy, drilling mud type of soil west of well centre  
Areas on lease with higher LEL moving around .. not in same location as 2008 |
| 2010 | SDS opinion it is a biogenic gas/swamp gas problem  
2010 LEL readings less then 2009 LEL readings. No samples taken |
| 2011 | SDS opinion is that gas being detected through field screening is swamp gas from the organic material beneath the wellsite.  
6-10 LEL readings lower than recorded in 2011. The gas sample collected contained insufficient hydrocarbons for carbon isotope analysis. |
| 2012 | No testing undertaken |
| 2013 | SDS considered the two samples (>100%, 54%) to be inconclusive as the soil around the well center was highly saturated, wet, sloppy, drilling mud type of soil.  
No sample was submitted for isotope analysis. |
Surface facility key learnings

- Safe operation of production and injection wells
- Geographical location provides challenges for instrumentation operations utilizing solar panels
- Purity of injection gases plays key role in maintaining injectivity
- Uneconomical to operate in today's pricing environment
Measurement and reporting

Surface section 2

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Measurement reporting

- Field Operations record daily flow variable and volume for air injection and compressor fuel usage
- Gas analysis - Maxxam
- Gas well gas meters loaded to PVR via SCADA system
- EnCaid Daily Volume Report Spreadsheet
- Production Accounting Activities
  1) PA updated gas analysis in PAS.
  2) PA entered air volume and fuel usage volume from EnCaid Daily Volume Report into PAS EnCaid injection facility.
  3) Well production PVR data upload to PAS.
  4) PAS generates PRA submission.
  5) PA manually updated the gas fuel usage into PRA.
- PVR
Environmental issues

Surface section 3

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Environmental compliance

• No environmental noncompliance events occurred since the last performance review
Compliance statement

Surface section 4

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Compliance Confirmation

- No noncompliance events occurred since the last performance review
Future Plans

Surface section 5

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Future plans

- No major initiatives or plans that may require submission of an application are contemplated at this time.
- No changes to overall plant design or amendments are anticipated at this time.
100/05-10-073-06W4 wellbore schematic
102/05-10-073-06W4 wellbore schematic
103/5-10-73-6W4/0 Wellbore Schematic
END SLIDE