Air injection & displacement for recovery with oil horizontal (AIDROH) project Approval #11618 Performance presentation
Advisory

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### Strong integrated oil portfolio

<table>
<thead>
<tr>
<th>TSX, NYSE</th>
<th>CVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise value</td>
<td>$27 billion</td>
</tr>
<tr>
<td>Shares outstanding</td>
<td>756 MM</td>
</tr>
<tr>
<td><strong>2013F production</strong></td>
<td></td>
</tr>
<tr>
<td>Oil &amp; NGLs</td>
<td>181 Mbbls/d</td>
</tr>
<tr>
<td>Natural gas</td>
<td>525 MMcf/d</td>
</tr>
<tr>
<td><strong>2012 proved &amp; probable reserves</strong></td>
<td>3.1 BBOE</td>
</tr>
<tr>
<td><strong>Bitumen</strong></td>
<td></td>
</tr>
<tr>
<td>Economic contingent resources*</td>
<td>9.6 Bbbls</td>
</tr>
<tr>
<td>Discovered bitumen initially in place*</td>
<td>93 Bbbls</td>
</tr>
<tr>
<td>Lease rights**</td>
<td>1.5 MM net acres</td>
</tr>
<tr>
<td>P&amp;NG rights</td>
<td>5.5 MM net acres</td>
</tr>
<tr>
<td>Refining capacity</td>
<td>229 Mbbls/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.
AIDROH*
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: Table of contents

1. Scheme Background
2. Geology / Geoscience
3. Drilling and Completions
4. Artificial lift
5. Instrumentation
6. Scheme Performance
7. Future Plans
Scheme background

Subsurface Section 1

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Location map

Christina Lake
Edmonton
Cold Lake
Calgary

AIDROH Project

Cold Lake Air Weapons Range

Foster Creek

69-10W4
69-1W4
73-10W4
73-1W4
Background

The Air Injection Displacement Horizontal Oil Recovery (AIDROH) project utilities gravity drainage as bitumen recovery process to recover bitumen which has been passively heated by Cenovus EnCAID combustion project.
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>25-30m</td>
</tr>
<tr>
<td>Average Porosity</td>
<td>35%</td>
</tr>
<tr>
<td>Average Bitumen Saturation</td>
<td>65%</td>
</tr>
<tr>
<td>Average Permeability</td>
<td>1,350mD</td>
</tr>
<tr>
<td>OBIP (Project Area)</td>
<td>3,302 e³m³</td>
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<tr>
<td>Oil Viscosity @ 13C</td>
<td>~35,000 cP</td>
</tr>
<tr>
<td></td>
<td>~600 cP</td>
</tr>
<tr>
<td>API Oil Gravity</td>
<td>10.3 -10.8</td>
</tr>
</tbody>
</table>
Wabiskaw bitumen thickness

OBIP under gas cap = 159,000 e³m³

AIDROH
Wabiskaw structure map

- 103/5-10 Post-burn well
- 104/5-10 Hz production well
- 102/5-10 Pre-burn OB well
- 100/5-10 Injection well
Wabiskaw stratigraphic cross-section

Interbedded sand and shale lenses and CC layers

Bottom water
Drilled in 2011 east of injector well at surface location 6-10
300m of horizontal leg landed 30m north of injector well and
~15m into heated zone
Drilling and completions

Subsurface section 3

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Well layout

Drilled 103/5-10-73-6W4 post-burn vertical well in September 2011

- Drilled 11m northwest of 102/5-10-73-6W4 pre-burn well
- Successfully cored 44m from top of Wabiskaw to top of McMurray – no lost core
- Extensive core and oil analysis program started in early 2012
  - Core - routine core analysis, thin section, SEM, XRD
  - Oil – API, viscosity, composition

Drilled 104/5-10-73-6W4 horizontal producer in September 2011

- 300m east-west horizontal section landed 30m north of 100/5-10-73-6W4 injector well and 15m below Wabiskaw gas/bitumen interface
- Equipped with 20 thermocouples along horizontal length
Completion

- 2013
- No recompletions
- No workovers

- Requirements under subsection 3.1.1 3c – wellbore schematics are included in the Appendix
Artificial lift

Subsurface section 4

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Artificial lift

- The artificial lift mode is:
  - PCP rotor pump
  - Lift capacity range of 30-40 m³/d
  - Operating temperature range: 37C to 94C
Artificial lift performance

- Well produced throughout 2013 except when shut-in from February 24, 2013 to April 21, 2013 to rebuild the facility for sour service
- Pump continues to perform within its design operating parameters
Instrumentation

Subsurface section 5

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Instrumentation in well

- 104/05-10-73-6W4/00 is equipped with thermocouples

- Requirements under subsection 3.1.1.5a – wellbore schematics, 5c and 5d are included in the Appendix
Thermocouple temp vs. depth
Scheme performance

Subsurface section 6

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Oil rate forecast
Production history

- Shut down for facility construction
- Slow down due to cold
- Slow down due to wet weather

www.cenovus.com
Heated oil volume

• Calculated using analytical geometry based method
• Combustion front heats bitumen by conduction in shape of sphere cap
  • Thermally affected radius ~ 230 m
• Chemically affected
  • 41,000 m³
• Thermal affected*
  • 479,000 m³

* Based on horizontal well depth 15m below gas/bitumen interface
Produced oil quality

- Original oil ~45,000 cP @ res conditions (dead)
- Not expecting significant upgrading

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Asphaltene (C5 insoluble)</th>
<th>Saturates</th>
<th>Resins</th>
<th>Aromatics</th>
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<tr>
<td>1</td>
<td>14.38</td>
<td>18.77</td>
<td>11.99</td>
<td>54.86</td>
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<td>21.00</td>
<td>11.89</td>
<td>52.82</td>
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<td>3</td>
<td>15.03</td>
<td>20.03</td>
<td>13.10</td>
<td>51.84</td>
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<td>19.76</td>
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<td>21.65</td>
<td>14.96</td>
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<td>11</td>
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<td>49.94</td>
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<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Viscosity (cSt), temp (°C)</th>
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<tr>
<td></td>
<td>13</td>
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<tr>
<td>1</td>
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<td>29.122</td>
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<td>14</td>
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Key learnings

• Thermocouple data necessary for simulation modeling on history match and production prediction scenarios

• Casing gas pressure not detected until late October
  • Bleed off immediately with gas flows too small to measure

• H₂S presence detected late in December 2012
  • Maximum recorded 30 ppm

• Contributions from toe section of producer limited based on observed thermocouple data
  • Evaluation underway for recompletion
Future plans

Subsurface section 7

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Future plans

A second horizontal producer is planned for Q4 2014.
The well will be equipped with fibre-optic cables for
temperature monitoring.

Incorporate learnings from 104/5-10-73-6W4/0 into
the completion and production strategy for the second
well.
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. Water, water disposal well and landfill waste
4. Sulphur production
5. Environmental issues
6. Compliance statement
7. Non-compliance discussion
8. Future plans
Facility overview / modifications

Surface operations section 1

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Site Survey
Modification rationale:
Compliance with sour oil battery operations and license
Facility performance

Rebuilt facility placed back on production late April

Slow ramp up production over balance of year

• September onward production purposely held steady

H₂S analyzer on site functional with restart

• Minimum operating pressure limits effectiveness until sufficient consistent casing pressure demonstrated

• Daily Draeger testing protocol in effect

Low operating temperatures prove problematic during winter operations
Gas usage

Usages are for blanket gases in sales oil tanks and incineration of produced sour gases

- Gas source Primrose plant sales
- Total usage 136.3 e3m3
## Green house gas emissions

<table>
<thead>
<tr>
<th>Month</th>
<th>2013 (tonne)</th>
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<tbody>
<tr>
<td>January</td>
<td>-</td>
</tr>
<tr>
<td>February</td>
<td>-</td>
</tr>
<tr>
<td>March</td>
<td>-</td>
</tr>
<tr>
<td>April</td>
<td>-</td>
</tr>
<tr>
<td>May</td>
<td>1.75</td>
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<tr>
<td>June</td>
<td>33.41</td>
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<tr>
<td>July</td>
<td>19.04</td>
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<tr>
<td>August</td>
<td>20.59</td>
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<tr>
<td>September</td>
<td>22.14</td>
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<tr>
<td>October</td>
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<tr>
<td>November</td>
<td>24.26</td>
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<tr>
<td>December</td>
<td>33.33</td>
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Measurement and reporting

Surface operations section 2

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Measurement and reporting

Field Operations take daily tank readings, enter into daily tracking

Daily AIDROH tracking Spreadsheet

Field Operations enter in truck tickets to PVR - total fluid volume only BSW

Production Accounting Activities
1) BSW cuts are determined based on the receiving facility oil and water volumes reported on manifest. These are entered into PVR.
2) Production (oil and water) is determined based on Closing Inventory-Opening Inventory-receipts+dispositions.
3) Battery production and gas meter reports from PVR used to create PRA Upload file.
4) PRA submission is completed.

PVR

Gas (vent, fuel, casing gas) meters loaded to PVR via SCADA system

Receiving facility provides manifest with detailed water and oil volume.
Water, water disposal wells and landfill waste

Surface operations section 3

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Water and waste disposal

- No produced water
- Produced bitumen volumes typically <2% BS&W
- No processing occurs on site
- All produced volumes are trucked out for processing
Sulphur production

Surface operations section 4

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Quarterly sulphur emissions and facility monthly sulphur balance not generated due to following:

- H$_2$S detected on December 28, 2013
- Casing gas pressures bleed off immediately with sour gas flows being too small to measure
Environmental issues

Surface operations section 5

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Environmental issues

No environmental issues occurred in 2013
Compliance statement

Surface operations section 6

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Compliance confirmation

No noncompliance events occurred in 2013
Noncompliance statement

Surface operations section 7

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Non compliance confirmation

No non-compliance events occurred since the last performance review
Future plans

Surface operations section 8

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Future Plans

Completion of associated battery facilities for the second AIDROH well
Wellbore schematic