The estimates of reserves and contingent resources were prepared effective December 31, 2014 and the estimates of bitumen initially-in-place were prepared effective December 31, 2012. All estimates were prepared by independent qualified reserves evaluators, based on definitions contained in the Canadian Oil and Gas Evaluation Handbook and in accordance with National Instrument 51-101. Additional information with respect to the significant factors relevant to the resources estimates, the specific contingencies which prevent the classification of the contingent resources as reserves, pricing and additional reserves and other oil and gas information, including the material risks and uncertainties associated with reserves and resources estimates, is contained in our AIF and Form 40-F for the year ended December 31, 2014, available on SEDAR at www.sedar.com, EDGAR at www.sec.gov and on our website at cenovus.com.

There is no certainty that it will be commercially viable to produce any portion of the contingent resources. There is no certainty that any portion of the prospective resources will be discovered. If discovered, there is no certainty that it will be commercially viable to produce any portion of those resources. Actual resources may be greater than or less than the estimates provided.

Total bitumen initially-in-place (BIIP) estimates, and all subcategories thereof, including the definitions associated with the categories and estimates, are disclosed and discussed in our July 24, 2013 news release, available on SEDAR at sedar.com and at cenovus.com. BIIP estimates include unrecoverable volumes and are not an estimate of the volume of the substances that will ultimately be recovered. Cumulative production, reserves and contingent resources are disclosed on a before royalties basis. All estimates are best estimate, billion barrels (Bbbls). Total BIIP (143 Bbbls); discovered BIIP (93 Bbbls); commercial discovered BIIP equals the cumulative production (0.1 Bbbls) plus reserves (2.4 Bbbls); sub-commercial discovered BIIP equals economic contingent resources (9.6 Bbbls) plus the unrecoverable portion of discovered BIIP (81 Bbbls); undiscovered BIIP (50 Bbbls); prospective resources (8.5 Bbbls); unrecoverable portion of undiscovered BIIP (42 Bbbls). Any contingent resources as at December 31, 2012 that are sub-economic or that are classified as being subject to technology under development have been grouped into the unrecoverable portion of discovered BIIP. Petroleum initially-in-place (PIIP) estimates for Pelican Lake are effective December 31, 2012 and were prepared by McDaniel. All estimates are best estimate discovered PIIP volumes as follows: Mobile Wabiskaw total PIIP (2.11 Bbbls); discovered PIIP (2.11 Bbbls); cumulative production (0.11 Bbbls); reserves (0.25 Bbbls); contingent resources (0.03 Bbbls); unrecoverable discovered PIIP (1.72 Bbbls); undiscovered PIIP (0 Bbbls). Mobile Wabiskaw development area total PIIP (1.62 Bbbls); discovered PIIP (1.62 Bbbls); cumulative production (0.11 Bbbls); reserves (0.25 Bbbls); contingent resources (0 Bbbls); unrecoverable discovered PIIP (1.26 Bbbls); undiscovered PIIP (0 Bbbls). Immobile Wabiskaw total PIIP (1.33 Bbbls); discovered PIIP (1.33 Bbbls); cumulative production (0 Bbbls); reserves (0 Bbbls); contingent resources (0 Bbbls); unrecoverable discovered PIIP (1.33 Bbbls); undiscovered PIIP (0 Bbbls).

Certain natural gas volumes have been converted to barrels of oil equivalent (BOE) on the basis of one barrel (bbl) to six thousand cubic feet (Mcf). BOE may be misleading, particularly if used in isolation. A conversion ratio of one bbl to six Mcf is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent value equivalency at the well head.

Non-GAAP measures

Certain financial measures in this document do not have a standardized meaning as prescribed by IFRS such as, Operating Cash Flow, Cash Flow, Operating Earnings, Free Cash Flow, Debt, Net Debt, Capitalization and Adjusted Earnings before Interest, Taxes, Depreciation and Amortization (“Adjusted EBITDA”) and therefore are considered non-GAAP measures. These measures may not be comparable to similar measures presented by other issuers. These measures have been described and presented in order to provide shareholders and potential investors with additional measures for analyzing our ability to generate funds to finance our operations and information regarding our liquidity. This additional information should not be considered in isolation or as a substitute for measures prepared in accordance with IFRS. Readers are encouraged to review our most recent Management’s Discussion and Analysis, available at cenovus.com for a full discussion of the use of each measure.
Subsection 3.1.1-1)
Brief background
Major scheme/project updates

Q1 2000  EUB project approval
Q2 2002  First steam of phase A pilot
Q4 2005  Approval of phase B expansion
Q2 2008  Phase B expansion first steam
Q3 2008  Approval of phase C/D amendment
Q1 2010  Approval of large gas cap air re-pressurization
Q2 2011  Approval of phase E/F/G EIA application
Q2 2011  Phase C expansion first steam
Q2 2012  Phase D expansion first steam
Q4 2012  Approval of phase F and G amendment
Q1 2013  Filing phase H and eastern expansion EIA
Q4 2013  CDE 2nd stage OTSG amendment
Q3 2013  Approval of development area expansion
Q4 2014  Receipt of phase H and eastern expansion SIR round 2

© 2015 Cenovus Energy Inc.  
June 24, 2015
Recovery process

- The Christina Lake Thermal Project uses the dual-horizontal well SAGD (steam-assisted gravity drainage) process to recover bitumen from the McMurray formation

- Two horizontal wells one above the other approximately 5 m apart

- Steam injected into upper well heat the bitumen and allows gravity to drain

- Oil and water emulsion pumped to the surface and treated
Area Map
Strong integrated portfolio

**TSX, NYSE | CVE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise value</td>
<td>C$25 billion</td>
</tr>
<tr>
<td>Shares outstanding</td>
<td>829 MM</td>
</tr>
<tr>
<td>2015F production</td>
<td></td>
</tr>
<tr>
<td>Oil &amp; NGLs</td>
<td>204 Mbbls/d</td>
</tr>
<tr>
<td>Natural gas</td>
<td>438 MMcfs/d</td>
</tr>
<tr>
<td>2014 proved &amp; probable reserves</td>
<td>3.9 BBOE</td>
</tr>
<tr>
<td>Bitumen</td>
<td></td>
</tr>
<tr>
<td>Economic contingent resources*</td>
<td>9.3 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>5.6 MM net acres</td>
</tr>
<tr>
<td>Refining capacity</td>
<td>230 Mmbls/d net</td>
</tr>
</tbody>
</table>

Values are approximate. Forecast production based on midpoints of January 28, 2015 guidance. Cenovus land at December 31, 2014. *See advisory. **Includes an additional 0.5 million net acres of exclusive lease rights to lease on our behalf and our assignee’s behalf.
Commercial SAGD wells as of March 31, 2015

- **B02 Pad**: 10 Well Pairs, 4 Wells*
- **B01 Pad**: 7 Well Pairs, 6 Wells*
- **A02 Pad**: 2 SAP Well Pairs
- **A01 Pad**: 6 Well Pairs
- **B08 Pad**: 10 Well Pairs
- **H01 Pad**: 12 Well Pairs
- **H03 Pad**: 12 Well Pairs
- **B05 Pad**: 9 Well Pairs, 9 Wells*
- **B07 Pad**: 8 Well Pairs, 8 Wells*
- **B04 Pad**: 8 Well Pairs, 8 Wells*
- **B11 Pad**: 12 Well Pairs
- **B10 Pad**: 10 Well Pairs
- **B09 Pad**: 11 Well Pairs
- **B06 Pad**: 8 Well Pairs, 9 Wells*
- **B03 Pad**: 8 Well Pairs, 8 Wells*
- **F01 Pad**: 12 Well Pairs
- **B07b Pad**: 11 Well Pairs
- **WA01-2 Well**: drilled from (B02 Pad)
- **WA01-3_4 Well**: drilled from (B02 Pad)

*Well using Wedge Well™ technology

© 2015 Cenovus Energy Inc.
June 24, 2015
Commercial SAGD wells as of March 31, 2015

Drainage Boxes

76-6-W4

Well using Wedge Well™ technology

© 2015 Cenovus Energy Inc.
June 24, 2015
Source and Disposal Wells as of March 31, 2015

RD 1
15-35-76-4W4 (6 well pad)

RD 2
13-34-76-3W4 (7 wells drilled)

RD 3
13-03-77-3W4 (1 observation well)

CW 1
10-34-75-6W4 (3 well pad)

CW 2
10-3-75-6W4 (2 well pad)

CW 3
10-27-75-6W4 (3 well pad)

CW 4
11-36-75-6W4 (3 well pad–drilled awaiting tie-in)

MW1
13-7-76-5W4
12-7-76-5W4 (3 well pad)

Local McMurray Disposal (2 wells)

Local McM Source (1 well)

Quaternary Fresh water source (2 wells @ 9-17-76-6W4)
Subsection 3.1.1 – 2) Geology and Geoscience

Ashley Saunders
Geologist
Reservoir properties (project area)

- Reservoir depth: 350m TVD
- Original reservoir pressure: 2500 kPa
- Original reservoir temperature: 12°C
- Average horizontal permeability: 7.0 Darcies
- Average vertical permeability: 4.2 Darcies
- Average SAGD pay: 21 meters
- Average porosity (Ø): 33%
- Average oil saturation: 80%
- Rock volume: $1,954 \times 10^6$ m$^3$
- SOIP = $516 \times 10^6$ m$^3$

Note: Cenovus Volumetric Estimates, not IQRE estimates

SOIP = Rock Volume in Project area x phi (.33) x So (.80)
Stratigraphic wells within PA: 554
(-Cenovus 494/60 Others)- 2014
- 2D seismic - 155 km
- 3D seismic - 80 km²
(entire project area now covered by 3D)
PA = Project Area

- 2014 4D – 11.86 km²
- 2014 – 3 Strat Wells, 38 obs wells

- 2015 – 4D – 14.32 km²
- 2015 – 2 strat wells, 39 obs wells
Christina Lake core analysis (McMurray)

- Total cored wells within PA-203: 203
- 2015 cored wells within PA-2015: 4
- 2014 cored wells within PA-2014: 10
- Total steam chamber cores-2014: 8

Analysis:
- Routine core analysis
- Photos

- Strat and strat/cored wells are generally abandoned
- Some strat and strat/cored wells are cased if they are further used for SAGD observation wells
- All abandoned and cased wells are examined for integrity by the completions department prior to SAGD startup
SAGD Pay Isopach
(Thickness in Meters)
SAGD base structure
(SSTVD)
SAGD top structure
(SSTVD)
Paleozoic structure
(SSTVD)
McMurray Isopach
(thickness in metres)
McMurray Structure
(SSTVD)
SAGD Gas Isopach
(thickness in meters)
Composite type log: Phase B

- Pervasive basal mud layer often separates bitumen and McMurray water
- Basal mud is discontinuous and ranges from 0-4 metres in thickness
- Provides a good marker during SAGD operations

Location:
Composite type log: Phase CDE

- Pervasive basal mud layer often separates bitumen and McMurray water
- Basal mud is discontinuous and ranges from 0-4 meters in thickness
- Provides a good marker during SAGD operations

Location:
Representative cross section
Cross section A-A’ (saturation)
Cross section A-A’ (lithology)
Cross section B-B’ (saturation)
Cross section B-B’ (lithology)
Geomechanical and surface heave

- Integrated InSAR (Synthetic Aperture Radar) Land Deformation Monitoring took place between April-October 2014 by MDA Geospatial Services Inc.
- The measurements were successfully made on 75 active corner reflector (CR) locations installed since April 2008.
- In addition to the corner reflectors, the deformation profiles at 19,710 point targets were estimated (coherent target monitoring-CTM). The location of these points coincides in general with pad, pipeline and plant structures.

Refer to Appendix 1 for detailed heave data
Corner reflector (CR) locations:

Current Corner Reflectors: 75
Current Reference Corner Reflectors: 11
SAGD summary to date

Well pair drilled but not producing
Well pair currently on production
Wedge Well™ technology currently on production
Well, expecting to use Wedge Well™ technology, drilled but not producing
Sample circulation and gas lift completion

**Intermediate casing**
- 9 5/8”

**Outer tubing**
- Historical size was 5.5” tubing
- Phase C, D, E tubing was increased to 7.0” tubing

**Inner tubing**
- Historical size was 2 7/8” tubing
- Phase C, D, E tubing was increased to 3.5” tubing

**Slotted liner**
- 7” slotted liner

**6 Pt Thermocouple**
- 1.25” coil tubing string to toe
Sample ESP producer completion with tailpipe

339.7 mm 71.4 kg/m
H-40 ST&C Surface casing

244.5 mm 59.5 kg/m
L-80 QB2 Production casing

Production tubing:
114.3 mm tubing

Bubble tube and thermocouple:
48.3 mm IJ tbg

Tail pipe

ESP

© 2015 Cenovus Energy Inc.
June 24, 2015
Sample ESP producer completion without tailpipe

339.7 mm 71.4 kg/m
H-40 ST&C Surface casing

244.5 mm 59.5 kg/m
L-80 QB2 Production casing

Production tubing:
114.3 mm tubing

Bubble tube and thermocouple:
48.3 mm IJ tbg
Sample injector completion

**Outer tubing**
-5.5” to 4.5” in horizontal with 2 to 5 steam subs and open toe

**Intermediate casing**
-9 5/8”

**Slotted liner**
-7” slotted liner
Inflow Control Devices (ICDs)

- No operational wells with ICDs
- First ICD production expected in 2016
Subsection 3.1.1 – 4) Artificial Lift

Mike Ellis
Production Engineer
## Review of artificial lift by well

<table>
<thead>
<tr>
<th>Pad</th>
<th>Start date</th>
<th>Total producers</th>
<th>Total gas lift producer wells</th>
<th>Total ESP producer wells</th>
<th>Total wells using Wedge Well™ technology and ESP</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Pad</td>
<td>2002</td>
<td>10</td>
<td>0</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>A02 Pad</td>
<td>2008</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>B01 Pad</td>
<td>2008</td>
<td>13</td>
<td>0</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>B02 Pad</td>
<td>2006</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>B02C Pad*</td>
<td>2013</td>
<td>6</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>B03 Pad</td>
<td>2011</td>
<td>16</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>B04 Pad</td>
<td>2011</td>
<td>16</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>B05 Pad</td>
<td>2012</td>
<td>9</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>B06 Pad</td>
<td>2012</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>B07 Pad</td>
<td>2012</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>B08 Pad</td>
<td>2013</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>B09 Pad</td>
<td>2014</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>B11 Pad</td>
<td>2013</td>
<td>12</td>
<td>0</td>
<td>12</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note: B02C refers to the 6 well pairs on the north side of the B02 Pad Approved Drainage Box, which were drilled at a 50m lateral downhole spacing*
Artificial lift performance

Gas lift (0 current wells):
• Typical operating pressure 4,000 – 5,000 kPag
• No temperature limitations, go as hot as ~263°C
• Average emulsion flow rate ~ 600-1600 m³/d

ESP (128 current wells):
• Majority of wells were converted to ESP after a gas lift phase
• ESP conversion occurs when thief zone intersected or other optimization purposes
• Typical operating pressure 1,800 – 4,000 kPag
• No temperature limitations, go as hot as ~235°C BHT
• Average emulsion flow rate ~ 200-1600 m³/d
Subsection 3.1.1 – 5) Instrumentation

Mike Ellis
Production Engineer
SAGD Well Pressure Instrumentation

At Christina Lake all production and injector wells are equipped with bubble tubes to measure downhole pressures.

Currently there are 2 sizes of bubbles tubes:
- $\frac{3}{8}$ inch
- $\frac{1}{2}$ inch

We are replacing all $\frac{3}{8}$ inch bubble tubes with $\frac{1}{2}$ inch to increase reliability.

Fiber pressure gauges have been trialed with poor results

Moving forward bubble tubes will continue to be the pressure instrumentation of choice at Christina Lake.
SAGD Well Temperature Instrumentation

At Christina Lake production wells use type ‘K’ thermocouples to measure downhole temperatures.

There are 2 thermocouple formats installed:
• Single point installed at the heel
• 6 point that is installed along the producer horizontal

Distributed temperature sensing (DTS) fiber instrumentation will be used new wells and on a go forward basis. (B07B- Oct 2015 forward)
Instrumentation in observation wells (typical completions)
Observation Well Equipment Reliability

Type ‘K’ Thermocouples
- Reliability has been very good
- Easy to replace if failed
- Thermocouple failures arise when the mineral insulated (MI) cable is compromised downhole.

Hanging piezometers
- Reliability has been good
- Easy to replace if failed
- Hanging piezometer failures occur most often during workovers. Either during RST logging or packer isolation work.
- Equipment failures have occurred but are rare.

Cemented piezometers
- Reliability has been poor
- Impossible to replace
- Early piezometer installs used standard vibrating wire piezometer rated to 80C – Many failed due to high temperatures
- Since 2013 – all piezometer installed have been high temperature vibrating wire piezometer rated to 250C – Have seen an increase in equipment reliability
- Have seen failures as a result of improper installation and well securement issues
Observation wells

Thermocouple well
Piezometer well

© 2015 Cenovus Energy Inc.
June 24, 2015
Subsection 3.1.1–5c) & d) instrumentation data

Requirements under subsection 3.1.1 5c) and d) are located in Appendices 2 & 3
Subsection 3.1.1 – 6)  
4D Seismic

Kevin Beary  
Reservoir Engineer
2014 Steam-affected top structure from 4D Seismic (TVDSS)

Structure Elevation

Low

High

- Piezometers
- RST Logs
- Thermocouples

© 2015 Cenovus Energy Inc.
June 24, 2015

© 2015 Cenovus Energy Inc.
June 24, 2015
2014 Steam-affected top structure from 4D seismic (TVDSS)
2014 Steam-affected top structure from 4D seismic (TVDSS)
2014 Steam-affected top structure from 4D seismic (TVDSS)
Subsection 3.1.1 – 7)
Scheme performance

Kevin Beary
Reservoir Engineer
Scheme performance prediction

- Predict well pair performance based on modified Butler’s equation
- Predict well pair CSOR using published CSOR correlations (Edmunds & Chhina 2002)
- Generate overall scheme production performance by adding individual well forecasts over time to honour predicted steam capacity and water treating availability
SAGD summary to date

- Well pair drilled but not producing
- Well pair currently on production
- Wedge Well™ technology currently on production
- Well, expecting to use Wedge Well™ technology, drilled but not producing
SAGD summary to date

128 total production wells in operation to date:

• 98 standard well pairs
  • all on ESP, no gas lift

• one offset toe producer well
  • ESP
  • increase recovery from A01-3 well pair

• 29 wedge wells using patented Wedge Well™ technology
  • all on ESP
  • 3 located in A01 pad
  • 1 in between B01 and B02 pad
  • 6 located in B01 pad
  • 3 located in B02 pad
  • 8 located in B03 pad
  • 8 located in B04 pad
Increase in PWSR due to regional Bottom Water pressure gradients and new pads with slightly elevated Sw.
Christina Lake Performance

- Oil Rate (m3/d)
- ISOR *10
- CSOR *10
- Average # of Wells on Production
- Water Rate (m3/d)
- Steam Inj Rate (m3/d)
- Produced Gas Rate (e3m3/d)
- Gas Co-Injection Rate (e3m3/d)

- Phase A/B Turnaround
- B09 Pad & B01 Pad Wells* (4,5,6) Startup
- B04 Pad Wells* Startup
- B03 Pad Wells* Startup

*Well using Wedge Well™ technology

© 2015 Cenovus Energy Inc.
June 24, 2015
SAGDable vs. producible OIP (SOIP vs. POIP)

We are presenting two tables
• SAGDable OIP & producible OIP

We define SAGDable OIP as:
• \((\text{Planned length}) \times (\text{Spacing}) \times (\text{Net SAGD pay: Base to top SAGD}) \times (S_o) \times (\Theta)\)
• Used during the planning phase
• Doesn’t change after well pair plans finalized
• Used to plan additional wells (Wedge Well™ technology, bypassed pay producers, re-drills, new pairs)
• We aim to drill the full planned length (typically 800m), and drill the producer well as low as possible in relation to Base SAGD

We define producible OIP as:
• \((\text{Effective length}) \times (\text{Spacing}) \times (\text{Effective pay: Producer to top SAGD}) \times (S_o) \times (\Theta)\)
• An “after-drilling” OOIP, based on well pair potential
• Changes with time and interpretation (obs. wells, 4D seismic, MWD error, etc.)
• Used to plan blowdown strategy
• This reflects actual well pair performance
  • incorporates actual overlapping slotted liner lengths initially (including blank sections <100m)
  • incorporates actual elevation of the producing well
  • incorporates lithology

Producible OIP is always < SAGDable OIP
SAGDable vs. producible OIP (definition)

Vertical

Horizontal

Effective length - slotted liner overlap (POIP)

Planned length - ICP to TD (SOIP)

SOIP

POIP
## POIP and RF per pad

> Note: Down spaced pads are not planned to incorporate Wedge Well™ technology

### Producible Oil in Place (POIP) and % Recovery

<table>
<thead>
<tr>
<th>Pad</th>
<th>Pad Area (m²)</th>
<th>Cumulative Oil Production (Mm³)*</th>
<th>AVG Porosity</th>
<th>AVG Oil Saturation</th>
<th>AVG Net Pay (m)</th>
<th>POIP (Mm³)</th>
<th>Recovery*</th>
<th>Ultimate Recovery w/o Wedge Well™ technology</th>
<th>Ultimate Recovery w/ Wedge Well™ technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>616,615</td>
<td>2,164</td>
<td>0.35</td>
<td>0.79</td>
<td>26</td>
<td>2,965</td>
<td>73.0%</td>
<td>~ 75-80%</td>
<td>~ 80-85%</td>
</tr>
<tr>
<td>A02</td>
<td>490,777</td>
<td>344</td>
<td>0.34</td>
<td>0.84</td>
<td>26</td>
<td>401</td>
<td>85.9%</td>
<td>~ 80-85%</td>
<td>N/A</td>
</tr>
<tr>
<td>B01</td>
<td>594,325</td>
<td>2,992</td>
<td>0.34</td>
<td>0.85</td>
<td>28</td>
<td>4,083</td>
<td>73.3%</td>
<td>~ 75-80%</td>
<td>~ 80-85%</td>
</tr>
<tr>
<td>B02</td>
<td>323,240</td>
<td>2,030</td>
<td>0.33</td>
<td>0.84</td>
<td>30</td>
<td>2,453</td>
<td>82.7%</td>
<td>~ 75-80%</td>
<td>~ 80-85%</td>
</tr>
<tr>
<td>B02C (down spaced)</td>
<td>298,590</td>
<td>788</td>
<td>0.35</td>
<td>0.83</td>
<td>22</td>
<td>1,712</td>
<td>46.0%</td>
<td>~ 80-85%</td>
<td>N/A</td>
</tr>
<tr>
<td>B03</td>
<td>640,532</td>
<td>3,210</td>
<td>0.33</td>
<td>0.84</td>
<td>32</td>
<td>5,223</td>
<td>61.5%</td>
<td>~ 75-80%</td>
<td>~ 80-85%</td>
</tr>
<tr>
<td>B04</td>
<td>640,780</td>
<td>3,440</td>
<td>0.33</td>
<td>0.82</td>
<td>35</td>
<td>5,701</td>
<td>60.3%</td>
<td>~ 75-80%</td>
<td>~ 80-85%</td>
</tr>
<tr>
<td>B05</td>
<td>727,639</td>
<td>2,389</td>
<td>0.33</td>
<td>0.82</td>
<td>36</td>
<td>6,509</td>
<td>36.7%</td>
<td>~ 75-80%</td>
<td>~ 80-85%</td>
</tr>
<tr>
<td>B06</td>
<td>644,480</td>
<td>1,868</td>
<td>0.32</td>
<td>0.81</td>
<td>28</td>
<td>4,241</td>
<td>44.0%</td>
<td>~ 75-80%</td>
<td>~ 80-85%</td>
</tr>
<tr>
<td>B07</td>
<td>653,601</td>
<td>2,587</td>
<td>0.32</td>
<td>0.82</td>
<td>35</td>
<td>5,728</td>
<td>45.2%</td>
<td>~ 80-85%</td>
<td>N/A</td>
</tr>
<tr>
<td>B08 Pad (down spaced)</td>
<td>567,185</td>
<td>946</td>
<td>0.36</td>
<td>0.87</td>
<td>27</td>
<td>4,365</td>
<td>21.7%</td>
<td>~ 80-85%</td>
<td>N/A</td>
</tr>
<tr>
<td>B09 Pad (down spaced)</td>
<td>560,421</td>
<td>276</td>
<td>0.32</td>
<td>0.85</td>
<td>36</td>
<td>5,012</td>
<td>5.5%</td>
<td>~ 80-85%</td>
<td>N/A</td>
</tr>
<tr>
<td>B11 Pad (down spaced)</td>
<td>603,377</td>
<td>1,578</td>
<td>0.34</td>
<td>0.84</td>
<td>32</td>
<td>4,786</td>
<td>33.0%</td>
<td>~ 80-85%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*As of March 31, 2015

% recovery = cum. production / SOIP

Ultimate Recovery % = ultimate cum. production / SOIP

Note: Resource estimates in this table are based on Cenovus volumetric calculations, and are not in accordance with National Instrument 51-101 guidelines. They are provided solely for the purpose of complying with Alberta regulatory requirements.
**SOIP and RF per pad**

Note: Down spaced pads are not planned to incorporate Wedge Well™ technology

<table>
<thead>
<tr>
<th>Pad</th>
<th>Pad Area (m²)</th>
<th>Cumulative Oil Production (Mm³)*</th>
<th>Avg Porosity</th>
<th>Avg Oil Saturation</th>
<th>Avg Net Pay (m)</th>
<th>SOIP (Mm³)</th>
<th>Recovery*</th>
<th>Ultimate Recovery w/o Wedge Well™ technology</th>
<th>Ultimate Recovery w/ Wedge Well™ technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>616,615</td>
<td>2,164</td>
<td>0.34</td>
<td>0.79</td>
<td>31</td>
<td>3,979</td>
<td>54.4%</td>
<td>~ 52-56%</td>
<td>~ 56-60%</td>
</tr>
<tr>
<td>A02</td>
<td>490,777</td>
<td>344</td>
<td>0.34</td>
<td>0.84</td>
<td>29</td>
<td>475</td>
<td>72.4%</td>
<td>~ 59-63%</td>
<td>N/A</td>
</tr>
<tr>
<td>B01</td>
<td>594,325</td>
<td>2,992</td>
<td>0.34</td>
<td>0.85</td>
<td>35</td>
<td>5,377</td>
<td>55.6%</td>
<td>~ 53-57%</td>
<td>~ 57-61%</td>
</tr>
<tr>
<td>B02</td>
<td>323,240</td>
<td>2,030</td>
<td>0.33</td>
<td>0.84</td>
<td>35</td>
<td>3,089</td>
<td>65.7%</td>
<td>~ 56-60%</td>
<td>~ 60-64%</td>
</tr>
<tr>
<td>B02C (down spaced)</td>
<td>298,590</td>
<td>788</td>
<td>0.35</td>
<td>0.83</td>
<td>29</td>
<td>2,243</td>
<td>35.1%</td>
<td>~ 53-57%</td>
<td>N/A</td>
</tr>
<tr>
<td>B03</td>
<td>640,532</td>
<td>3,210</td>
<td>0.33</td>
<td>0.84</td>
<td>42</td>
<td>7,015</td>
<td>48.6%</td>
<td>~ 56-60%</td>
<td>~ 56-60%</td>
</tr>
<tr>
<td>B04</td>
<td>640,780</td>
<td>3,440</td>
<td>0.33</td>
<td>0.82</td>
<td>42</td>
<td>7,079</td>
<td>48.6%</td>
<td>~ 56-60%</td>
<td>~ 60-64%</td>
</tr>
<tr>
<td>B05</td>
<td>727,639</td>
<td>2,389</td>
<td>0.33</td>
<td>0.82</td>
<td>43</td>
<td>8,161</td>
<td>29.3%</td>
<td>~ 56-60%</td>
<td>~ 56-60%</td>
</tr>
<tr>
<td>B06</td>
<td>644,480</td>
<td>1,868</td>
<td>0.32</td>
<td>0.81</td>
<td>35</td>
<td>5,584</td>
<td>33.4%</td>
<td>~ 53-57%</td>
<td>~ 57-61%</td>
</tr>
<tr>
<td>B07</td>
<td>653,601</td>
<td>2,587</td>
<td>0.32</td>
<td>0.82</td>
<td>41</td>
<td>6,960</td>
<td>37.2%</td>
<td>~ 58-62%</td>
<td>N/A</td>
</tr>
<tr>
<td>B08 Pad (down spaced)</td>
<td>567,185</td>
<td>946</td>
<td>0.33</td>
<td>0.75</td>
<td>36</td>
<td>4,659</td>
<td>20.3%</td>
<td>~ 66-70%</td>
<td>N/A</td>
</tr>
<tr>
<td>B09 Pad (down spaced)</td>
<td>560,421</td>
<td>276</td>
<td>0.32</td>
<td>0.83</td>
<td>43</td>
<td>6,203</td>
<td>4.4%</td>
<td>~ 57-61%</td>
<td>N/A</td>
</tr>
<tr>
<td>B11 Pad (down spaced)</td>
<td>603,377</td>
<td>1,578</td>
<td>0.33</td>
<td>0.80</td>
<td>38</td>
<td>5,998</td>
<td>26.3%</td>
<td>~ 56-60%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

% recovery = cum. production / SOIP  
Ultimate Recovery % = ultimate cum. production / SOIP

*As of March 31, 2015

Note: Resource estimates in this table are based on Cenovus volumetric calculations, and are not in accordance with National Instrument 51-101 guidelines. They are provided solely for the purpose of complying with Alberta regulatory requirements.

© 2015 Cenovus Energy Inc.  
June 24, 2015
Christina Lake
Cumulative % Recovery Based on CVE SAGDable OOIP (SOIP)

Note: For A02 pad, recovery based on 100m spacing drainage box
Christina Lake
Cumulative % Recovery Based on CVE SAGDable OOIP (POIP)

Note: For A02 pad, recovery based on 100m spacing drainage box
Varying reservoir quality pad patterns

Two example well pairs provided in Subsection 3.1.1 – 7b) illustrate:

• **B05-6**: High reservoir quality
• **B02-1**: Medium reservoir quality
• Expect the same ultimate recovery long-term

**Phase B**
- 102/12-15-76-6W4
- Phase B area
- Cross-bedded sands
- Medium to fine grained
- $\sim$7 D $K_{\max}$
- 32% Porosity
- $K_v/K_H \sim 0.5$-$0.75$

**Phase CDE**
- 100/09-11-76-6W4
- Phase C area
- Massive sands
- Coarse grained
- $\sim$10 D $K_{\max}$
- 34% Porosity
- $K_v/K_H \sim 1.0$
Cumulative % recovery  B02-1 & B05-6

B02-1 well pair

Well pair drilled but not producing
Well pair currently on production
Wedge Well™ technology currently on production
Well, expecting to use Wedge Well™ technology, drilled but not producing
Why is B02P01 iSOR so high in 2014?

- Declining production rates – has been declining since 2010
- Has produced over 2,700,000 bbl of oil
- Recovery rates of 76%
- Decline further accelerated by the B02W03 and B02W06 start ups
- Continue to maintain steam rates for B02 pad pressure support and blowdown trial baseline.
- B02 Pad is operated on a pad level – not overly concerned with an individual well having a high iSOR on this pad
B02-1 well pair – observation well 103/05-15

GP-5 (B0201 MID) 103051507606W400

- Correlation: GR
- Facies: API 1500
- Depth: TVDSS
- Resistivity: AHT00, OMM 2000, VAX 10
- Temperature: T_Jan14, T_Jan15

© 2015 Cenovus Energy Inc.
June 24, 2015
Five year outlook – pad abandonments

• There are no anticipated pad abandonments for any of the Christina Lake wells in the next five years.
Wellhead steam quality

• Steam quality will be impacted by pipeline size and distance
• Current steam quality injected into all pads is calculated to be greater than 95%
• Currently steam head pressure is operated at 8.5 MPag with a corresponding steam temperature of 300°C
• Steam quality is not expected to impact well performance at this time
Subsection 3.1.1 – 7e) Injected fluids

Co-injection and blowdown trials
**A01 pad methane co-injection**

- **Methane co-injection until October 2014**
  - Natural gas was co-injected with steam into A01-1 to 3 and A01-5 & 6
  - The composition of this gas is ~99% pure methane as it is delivered to the wells from our main gas pipeline
  - Due to facility restriction on handling produced gas:
    - gas injection was intermittently shut off for extended periods
    - while co-injecting, gas injection rates were lower than the maximum approved rates
      - typical injection rates were 25 $\times$ 10$^3$ m$^3$/d natural gas, 1,000 m$^3$/d steam for the entire pad
A01 pad methane co-injection

- Methane co-injection experience (2007 - 2014)
  - Co-injection of methane with steam in SAGD has been demonstrated in the field to improve SOR
  - High percentage of injected methane appears to get produced preventing excessive accumulation in the steam chamber
  - Good understanding of how gas behaves in reservoir
    - allow for increased understanding of drainage from I.H.S
  - Pad partial/full blowdown as of November 2014
    - Steam shut-in and chamber pressure being increased through methane injection in order to mitigate bottom water influx
A01 partial/full-blowdown on A01 pad

- **Pad partial/full blowdown as of November 2014**
  - November 2014: steam ramp down began on the entire pad
  - February 2015: full steam shut-in to all wells on the pad. Pressure maintenance continued through natural gas injection.
    - current chamber average operating pressure ~ 2100 kPa
    - so far no negative impact has been observed with the pad operations as a result of full methane injection. It’s too early to comment on the trial performance
  - average concentration for Nov 2014 – March 2015
    - average methane injection rate 16 e3m3/d
    - CSOR has been maintained at 2.53 from November 2014 to March 2015 following a steady increase prior to steam ramp down
### A01 pad general co-injection/blowdown performance

#### A01 pad phases of operation

<table>
<thead>
<tr>
<th>Period</th>
<th>RF (%) (SOIP)</th>
<th>RF (%) (POIP)</th>
<th>CSOR (v/v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec ’05 – Dec ’06 (co-injection: 12 months)</td>
<td>20.7 – 29.4 (0.73%/mo)</td>
<td>27.8 – 39.5 (0.98%/mo)</td>
<td>2.47 – 2.37</td>
</tr>
<tr>
<td>Dec ’06 – Dec ’07 (SAGD: 12 months)</td>
<td>29.4 – 34.2 (0.40%/mo)</td>
<td>39.5 – 45.9 (0.53%/mo)</td>
<td>2.37 – 2.36</td>
</tr>
<tr>
<td>Dec ’07 – Oct ’14 (intermittent/limited co-</td>
<td>34.2 – 54.0 (0.24%/mo)</td>
<td>45.9 – 72.5 (0.32%/mo)</td>
<td>2.36 – 2.53</td>
</tr>
<tr>
<td>injection: 82 months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov ’14– Mar ’15 (ramp/blowdown: 5 months)</td>
<td>54.0 – 54.4 (0.08%/mo)</td>
<td>72.5 – 73.0 (0.1%/mo)</td>
<td>2.53 – 2.53</td>
</tr>
</tbody>
</table>
B01/B02 pad rampdown/blowdown pilot

Conduct a temporary wind-down test on B01 and B02 pads

- timeframe: 6 months – 1 year
- well pairs: B02-1 to B02-4 ; B01-1 to B01-4
- steam will be brought back on after test is complete

**B01-1 to B01-4: Blowdown test (6 month test)**

- shut-in steam on all four wells
  - using gas cap (top down blowdown) to maintain pressure
- current pad RF: 73% POIP

**B02-1 to B02-4: Steam ramp-down test (1 year test)**

- cut steam by 25% every 3 months (75%, 50%, 25%, 0%)
- current pad RF: 83% POIP

**Planned start date: June 2015**

- currently re-pressuring gas cap to ~2500 kPag in order to be in balance with bottom water
- steady SAGD operations to be continued until the wind-down test is started in mid-June 2015
B01/B02 pad rampdown/blowdown pilot location

76-6-W4
B01/B02 pad rampdown/blowdown test setup

Strategy: Top down blowdown
Will start injecting methane followed by air in 6-15 to support gas cap pressure (as required)

© 2015 Cenovus Energy Inc.
June 24, 2015
Subsection 3.1.1 – 7e) Injected fluids

A02-2 SAP project
What is SAP?

• Solvent-aided process is a technological enhancement applied to our SAGD operations that helps us maximize the amount of oil recovered. Small amounts of solvent such as light alkanes (e.g. butane) or natural gas liquids are co-injected with steam to enhance the oil recovery process and improve associated project economics.

• Solvents primarily decrease SOR, thereby reducing the water usage. Reduction in water usage means lower CAPEX and OPEX required to process the water.

• Reduced water usage leads to fewer GHG emissions, and smaller footprint.

• Solvents accelerate the oil production rate and reduce the steam usage, leading to a lower SOR, increased revenue and increased reserves. A02-2 SAP at CL : 30% SOR reduction and 20% increase in production.

• Co-injection of light alkanes along with steam allows for wider well spacing, which leads to smaller footprint, lower capital cost and higher revenue.
SAP process
A02 pad SAP

Current A02-2 Pilot

Future A02-1 Pilot

Current A02-2 pilot

- Currently in low pressure ESP phase
- Injector BHP avg 2325 kPa
- Recycled butane injection only, no make-up butane at this time
- Will transfer butane injection over to A02-1
- Received blowdown approval on A02-2
A02-2 production

May 3 – July 9 SAP and AB Facility Outage
Pre and post A02-2 well: oil production

Oil Pre-SAP = 785 bbl/d
Oil After SAP = 879.1 bbl/d
Pre and post SAP A02-2 well: CSOR and ISOR

- Pre-SAP CSOR Pre-SAP = 2.37
- SOR After SAP = 1.66
- High Pressure SAP
- Low Pressure SAP

Time (Days)

© 2015 Cenovus Energy Inc.
June 24, 2015
A02-2 Conclusions

• We believe SAP has resulted in lower than usual SOR

• We believe SAP has resulted in faster steam chamber lateral growth that could affect future well well spacing

• Current butane recovery is 65% and will increase during blowdown (we do not believe that we have lost much butane to thief zones)

• We believe that SAP has not resulted in dramatically higher rates due to geology and well profile
Subsection 3.1.1 – 7e) Injected fluids

Surfactant steam Process (SSP) pilot
SSP pilot description

Surfactant steam process (SSP)
Co-inject surfactant at <0.30 wt% of steam rate
SSP well operation overview

- **July 2013** – First Steam
- **August 2013** – Conversion to gas lift
- **November 2013** – HP ESP (4000 kPa BHP)
- **January 2014** – Surfactant-steam co-injection begins
  
  Surfactant-1 → B11-10
  Surfactant-2 → B11-11
- **June 2014** – Present – LP ESP (2800 kPa BHP)
- Results are promising, however steam chambers have communicated with neighboring wells and the overlaying gas cap, therefore more results are required
- Plan to continue the pilot to the end of 2015
Subsection 3.1.1 – 7e) Injected fluids
CondenSAP pilot

CondenSAP
• Using condensate mix as solvent

B01-7 CondenSAP
• Well pair currently operating on ESP
• Solvent injection: December 2012 to December 2013
• Currently bringing pressure in balance with gas cap

<table>
<thead>
<tr>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cum. wt% solvent injected</td>
<td>5% Solvent injection limited by vapour handling capacity and treating upsets in central processing facility (CPF).</td>
</tr>
<tr>
<td>Cum. solvent recovery (%)</td>
<td>15% Solvent production limited by losses to top gas zone.</td>
</tr>
</tbody>
</table>
B01-07 production/steam

Condensate injection from 12-06-2012 to 12-08-2013
CondenSAP conclusions

• Relatively poor geology and facility issues have not allowed steady operation nor steady injection of condensate

• Pressure readings suggest that we have connected to the neighbouring gas cap
  • This would explain the low solvent recovery

• We do not have conclusive results from this pilot and it may have to be repeated
Subsection 3.1.1 – 7e) Injected fluids

B05-8 rise rate control test
Rise rate pilot

• Location of rise rate pilot was moved to B05-8
• Modifications to the design were required in order to make the compressor system operational
• Intent of pilot was to inject air and steam during the chamber rise phase:
  • monitor if/how the shape of the chamber differs from regular SAGD as it grows vertically
  • monitor changes in the rate of steam rise
• B05-8 steam chamber has connected to gas cap under regular SAGD ops
  • rise rate control opportunity missed on B05-8
  • no plan to progress pilot in 2015
  • continue to evaluate future locations for the rise rate pilot
Subsection 3.1.1 – 7f) 2014 key learnings

Operating SAGD with top gas, bottom water
Operations at Christina Lake

Thief zones:

- B01 to B11 pad are operating under a gas cap
- A01, B01 to B09 and B11 Pads have areas where Regional Bottom Water (BW) present with no shale break separating oil and BW

Well performance of these two situations will be discussed:

- gas cap communication only
- bottom water and gas cap communication
High pressure operations

For high pressure operations, the SAGD chamber has to be isolated from other zones

- no gas cap or bottom water contact
Gas cap at Christina Lake

Section 15 Gas Cap (Currently being repressured with natural gas)

Section 11-14 Gas Cap (repressured with air)
Bottom Water Pressure Influence

2002-2006: Historical disposal into the local bottom water aquifer caused an increase to bottom water pressure
• moved disposal to remote location (15-35-076-06W4, 28 km from CPF) and saw immediate and significant drop in aquifer pressure

2010-2014: Regional activity from neighboring operators caused an increase to bottom water pressure
• reversed 1F5/3-16-076-06W4 local disposal well to a water production well
• developing an integrated strategy with regional partners to manage bottom water pressure
B06 Pad – Bottom water with no isolation

- **Blue** = bottom water
- **Grey/Black/Orange** = mud barrier (isolates oil & water zones)
- Anywhere with blue and no grey: Oil in direct contact with water
Ideally, we would like to operate in perfect pressure balance with the bottom water
B06 pad produced water to steam ratio (PWSR)

- Operating the pad to balance bottom water influx
Subsection 3.1.1 – 7f) 2014 key learnings

Patented Wedge Well™ technology
Patented Wedge Well™ technology locations

- B02 PAD: B02W03, B02W06, B02W07, B02W08
- B04 PAD: B04W01, B04W02, B04W03, B04W04, B04W05, B04W06, B04W07, B04W08
- A01W01

Legend:
- Well pair drilled but not producing
- Well pair currently on production
- Wedge Well™ technology currently on production
- Well, expecting to use Wedge Well™ technology, drilled but not producing

© 2015 Cenovus Energy Inc.
June 24, 2015
Wedge Well™ Placement

- Wedge Wells™ are typically landed at the same height as neighbouring producer wells
- Where the opportunity exists to lower the Wedge Wells™ relative to parent producers, they may be lowered by up to 2m
  - Variations greater than 2m are typically avoided, due to the operational impacts on parent pairs
A01 pad neighboring wells and patented Wedge Well™ technology performance

- B02W04 & B02W05 were drilled from B02 pad surface location

*Well using Wedge Well™ technology
B01 pad neighboring wells and patented Wedge Well™ technology performance

- B01W04, W05, W06 are located on the south side of B01 Pad

*Well using Wedge Well™ technology
B02 pad neighboring wells and patented Wedge Well™ technology performance
B03 pad neighboring wells and patented Wedge Well™ technology performance

- B03W01 is not operational

*Well using Wedge Well™ technology
B04 pad neighboring wells and patented Wedge Well™ technology performance

- B04W01 & 02 have not been started up

*Well using Wedge Well™ technology
Subsection 3.1.1 – 7f)
2014 key learnings

Wabiskaw Zone at Christina Lake
Over-pressured Wabiskaw first identified in April 2013 while attempting to drill a steam chamber core (107/06-15-76-6W4/00).

Conductive heating of bitumen in low-perm Wabiskaw from underlying steam chamber created an increase in reservoir pressure from ~2000 kPa to ~6500 kPa.
Wabiskaw observation wells in pressured area

15-076-06W4

4D seismic changes (2011-2014) in WBSK shown on WBSK pay map

100/11-15-76-6W4
Recompleted with pressure monitoring
4452-4673 kPag

107/06-15-76-6W4 Producer
5086 kPag 18.5°C (Shut-In)
3100 kPag 110°C (Flowing)

107/06-15-76-6W4
WBSK producing well
2615-3908 kPag
31.8-41.8°C BHT

109/06-15-76-6W4
Drilled and installed temperature and pressure monitoring (April 2014)
5703-6250 kPag
18.5°C BHT

109/06-15-76-6W4
Drilled and installed temperature and pressure monitoring (Fall 2013)
2615-3908 kPag
31.8-41.8°C BHT

Data Ranges over Jan 2014-April 2015 period

© 2015 Cenovus Energy Inc.
June 24, 2015
Wabiskaw production: 107/06-15-76-6W4

Note: the well was shut-in on Oct. 29, 2014 to recomplete the well and install a single-well battery facility.
Wabiskaw pressure and flow rates

Note: the well was shut-in on Oct. 29, 2014 to recomplete the well and install a single-well battery facility.
Existing observation wells within operating area
Subsection 3.1.1 – 7g) Information requests

Well trajectory guidelines
List of re-drills/re-entry wells in 2014-2015

The list of re-drill/re-entry wells in 2014-2015 is summarized in table below:

<table>
<thead>
<tr>
<th>UWI</th>
<th>WELLNAME</th>
<th>RE-DRILL/RE-ENTRY REASON</th>
</tr>
</thead>
<tbody>
<tr>
<td>104/15-12-076-06W4/00</td>
<td>CVE FCCL B10P01 LEISMER 15-12-76-6</td>
<td>Successfully drilled to a FTD of 1945m MD, unfortunately the BHA and drill string became stuck while back reaming at 1432m MD. After many days of attempting to retrieve the equipment, the internal components of the MWD tool were salvaged while the BHA and remainder of the drill string were left down hole. The well was side tracked at 761m MD.</td>
</tr>
<tr>
<td>104/15-12-076-06W4/02</td>
<td>CVE FCCL B10P01 LEISMER 15-12-76-6 S01</td>
<td></td>
</tr>
</tbody>
</table>
### Summary of well spacing in existing & future pads

The well spacing in existing pads is summarized in table below:

<table>
<thead>
<tr>
<th>SAGD pad</th>
<th>Inter well pair spacing [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01</td>
<td>110</td>
</tr>
<tr>
<td>A02</td>
<td>100</td>
</tr>
<tr>
<td>B01</td>
<td>100</td>
</tr>
<tr>
<td>B02</td>
<td>100</td>
</tr>
<tr>
<td>B03</td>
<td>100</td>
</tr>
<tr>
<td>B04</td>
<td>100</td>
</tr>
<tr>
<td>B05</td>
<td>100</td>
</tr>
<tr>
<td>B06</td>
<td>100</td>
</tr>
<tr>
<td>B07</td>
<td>100</td>
</tr>
<tr>
<td>B08</td>
<td>70</td>
</tr>
<tr>
<td>B11</td>
<td>67</td>
</tr>
<tr>
<td>B09</td>
<td>64</td>
</tr>
</tbody>
</table>

**Future Pad Spacing**

- All pads drilled in 2015/2016 will have inter well spacing of 65m - 70m
Criteria to determine standoff from bottom water

Cenovus optimizes the well position from the base of the reservoir and bottom water

• To maximize resource recovery and operational efficiency

Wells are targeted to land at ~50% oil saturation

• Excluding other factors such as potential barriers
• Planned trajectories are ~2m higher than this due to the drilling error that is consistently observed
Subsection 3.1.1 – 7g) Information requests

B02-2 bottom water influx

May 13, 2014
Application 1773237
B02-2 bottom water influx

• Bottom water influx into B02 pad due to regionally elevated bottom water pressure

• Risk of flooding B01, B02 chambers, similar to challenges on A01 pad

• Large developed steam chamber; therefore, re-pressurization with steam would not be efficient

• Ability to inject natural gas into the gas cap to support chamber pressures and bring us in balance with bottom water pressure
B02-2 chamber cooling
6-15 Natural gas injection
## B01/B02 BHP

<table>
<thead>
<tr>
<th>Well name</th>
<th>Current IBHP*</th>
</tr>
</thead>
<tbody>
<tr>
<td>B01-1</td>
<td>2516 kPa</td>
</tr>
<tr>
<td>B01-2</td>
<td>2494 kPa</td>
</tr>
<tr>
<td>B01-3</td>
<td>2495 kPa</td>
</tr>
<tr>
<td>B01-4</td>
<td>2490 kPa</td>
</tr>
<tr>
<td>B01-5</td>
<td>2504 kPa</td>
</tr>
<tr>
<td>B01-6</td>
<td>2518 kPa</td>
</tr>
<tr>
<td>B02-1</td>
<td>2557 kPa</td>
</tr>
<tr>
<td>B02-2</td>
<td>Bubble tube inoperable</td>
</tr>
<tr>
<td>B02-3</td>
<td>2652 kPa</td>
</tr>
<tr>
<td>B02-4</td>
<td>2507 kPa</td>
</tr>
<tr>
<td>B02-5</td>
<td>2566 kPa</td>
</tr>
</tbody>
</table>

*Current as of April 21, 2015 © 2015 Cenovus Energy Inc.

© 2015 Cenovus Energy Inc.
June 24, 2015
B01 BHT

- Bottomhole temperatures continue to rise with pressure
- No sign of bottom water cooling on any producing well
B02 BHT

- Bottomhole temperature continues to rise with pressure.
- B02-2 had shown performance degradation due to bottom water influx – successfully reversed with repressurization operations.
Chlorides

- All chlorides trending down with chamber re-pressurization
Path forward

• Bottom water has been mitigated

• Applied to AER to switch to air injection

• Once 2,500 kPag (corrected to account for bottom water piezometer stand-off) is reached, transition to rampdown/blowdown phase on B02-1 through B02-4, and B01-1 through B01-4

• Targeting Mid-June 2015 to begin blowdown trial
  • inject methane or air into section 15 gas cap to support pressure
B02-2 chamber temperature recovery
Subsection 3.1.1 – 7h) Pad production plots
Pad production plots

Requirements under subsection 3.1.1 7h) are located in Appendix 4
Subsection 3.1.1 – 8) Future plans

Kevin Beary
Reservoir Engineer
Resource recovery strategy

Well/pad placement:

• 2015/2016 well pairs will be drilled as per the existing (or future) applications and approvals
• Well spacing/trajectories planned to be submitted for approval up to one year prior to construction/drilling

No changes in the overall resource recovery strategy (operating pressure, composition of injected fluid)

Any deviations will be applied for as future amendments
<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Date filed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Phase H and eastern expansion</td>
<td>March, 2013</td>
</tr>
<tr>
<td>1</td>
<td>Emulsion circulation during unscheduled plant shutdown</td>
<td>April, 2014</td>
</tr>
<tr>
<td>2</td>
<td>B01/B02 rampdown/blowdown pilot</td>
<td>April, 2014</td>
</tr>
<tr>
<td>1</td>
<td>Phase D aerial cooler equipment change</td>
<td>June, 2014</td>
</tr>
<tr>
<td>2</td>
<td>Casing gas re-injection B03-7</td>
<td>March, 2014</td>
</tr>
<tr>
<td>2</td>
<td>Air co-injection trial B05-8</td>
<td>July, 2014</td>
</tr>
<tr>
<td>2</td>
<td>L pad trajectory amendment</td>
<td>June, 2014</td>
</tr>
<tr>
<td>2</td>
<td>Producer well length extension (B10-1 to B10-5)</td>
<td>May, 2014</td>
</tr>
<tr>
<td>2</td>
<td>A01 permanent blowdown</td>
<td>August, 2014</td>
</tr>
<tr>
<td>2</td>
<td>A02-2 SAP methane injection to demonstrate butane recovery</td>
<td>August, 2014</td>
</tr>
<tr>
<td>2</td>
<td>B13 well length extension</td>
<td>December, 2014</td>
</tr>
</tbody>
</table>
## Filed applications

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Date filed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ph CDE oil debottleneck</td>
<td>Feb, 2015</td>
</tr>
<tr>
<td>1</td>
<td>Multi directional wells SAGD enhanced lengths</td>
<td>March, 2015</td>
</tr>
<tr>
<td>2</td>
<td>Non-condensable gas ventilation well (B08 or H01)</td>
<td>March, 2015</td>
</tr>
<tr>
<td>2</td>
<td>L09, J05, L07 well length extension</td>
<td>March, 2015</td>
</tr>
</tbody>
</table>
### Potential future applications

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Planned filing date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Sustaining pad trajectory amendment</td>
<td>Q3 2015</td>
</tr>
<tr>
<td>2</td>
<td>B03/B04/B07 co-injection/blowdown</td>
<td>Q3 2015</td>
</tr>
<tr>
<td>3</td>
<td>Development area expansion</td>
<td>Q4 2015</td>
</tr>
</tbody>
</table>
## Drilling plans - 2015

<table>
<thead>
<tr>
<th>Pad</th>
<th>Pad type</th>
<th>Well count</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>J03</td>
<td>Production</td>
<td>11 well pairs</td>
<td>Q1 2015</td>
</tr>
<tr>
<td>L03</td>
<td>Production</td>
<td>7 well pairs and 2 wells*</td>
<td>Q1 2015</td>
</tr>
<tr>
<td>L05</td>
<td>Production</td>
<td>7 well pairs and 2 wells*</td>
<td>Q2 2015</td>
</tr>
<tr>
<td>B13</td>
<td>Production</td>
<td>12 well Pairs</td>
<td>Q2 2015</td>
</tr>
<tr>
<td>J01</td>
<td>Production</td>
<td>11 well pairs</td>
<td>Q2 2015</td>
</tr>
<tr>
<td>L09</td>
<td>Production</td>
<td>11 well Pairs</td>
<td>Q3 2015</td>
</tr>
<tr>
<td>MW1</td>
<td>Brackish source</td>
<td>3 wells</td>
<td>Q1 2015</td>
</tr>
<tr>
<td>MW4</td>
<td>Brackish source</td>
<td>3 wells</td>
<td>Q2 2015</td>
</tr>
</tbody>
</table>

*Wells using Wedge Well™ technology
SAGD drilling plans 2015

L05 Pad: 7 Well Pairs and 2 Wells*

L09 Pad: 11 Well Pairs

L03 Pad: 7 Well Pairs and 2 Wells*

B13 Pad: 12 Well Pairs

J03 Pad: 11 Well Pairs

J01 Pad: 11 Well Pairs

*Wells using Wedge Well™ technology
## Drilling plans - 2016

<table>
<thead>
<tr>
<th>Pad</th>
<th>Pad type</th>
<th>Well count</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>J07</td>
<td>Production</td>
<td>12 well pairs</td>
<td>Q1 2016</td>
</tr>
<tr>
<td>B07</td>
<td>Production</td>
<td>8 wells*</td>
<td>Q1 2016</td>
</tr>
<tr>
<td>J09</td>
<td>Production</td>
<td>12 well pairs</td>
<td>Q1 2016</td>
</tr>
<tr>
<td>H09</td>
<td>Production</td>
<td>11 well pairs and 1 well*</td>
<td>Q1 2015</td>
</tr>
<tr>
<td>J05</td>
<td>Production</td>
<td>10 well pairs and 1 well*</td>
<td>Q2 2016</td>
</tr>
<tr>
<td>H07</td>
<td>Production</td>
<td>12 well pairs</td>
<td>Q2 2016</td>
</tr>
<tr>
<td>B12</td>
<td>Production</td>
<td>11 well pairs</td>
<td>Q4 2016</td>
</tr>
<tr>
<td>RD2</td>
<td>Disposal</td>
<td>3 wells</td>
<td>Q2 2016</td>
</tr>
</tbody>
</table>

*Wells using Wedge Well™ technology*
SAGD drilling plans 2016

B07 Pad: 8 Wells*
B12 Pad: 11 Well Pairs
J05 Pad: 10 Well Pairs and 1 Well*
H07 Pad: 12 Well Pairs
H09 Pad: 11 Well Pairs and 1 Well*
J07 Pad: 12 Well Pairs
J09 Pad: 12 Well Pairs

*Wells using Wedge Well™ technology
Source and disposal drilling plans

MW1 McMurray Source Pad
3 Wells (Drilled - 2015)

MW4 McMurray Source Pad
3 Wells (Planned - 2015)

RD2 McMurray Disposal Pad
3 Additional Wells (2016)
Future strat well drilling plans 2016

- 2016 Abandoned Strat Well
- 2016 Cased Observation Well
Steam strategy 2015

• Phase CDE second stage OTSG adding 6,695 m³/d incremental capacity, bringing total capacity to 46,218 m³/d
• One additional pad planned to start up with Phase CDE second stage OTSG: B07B (11 Well Pairs)
• The following pads are planned to start up for sustaining production: B05 Wedge Well™ technology, F01
  • total of 12 well pairs and nine wells using Wedge Well™ technology
• Blowdown operations:
  • planned to continue at A01 pad
  • pilot test planned to commence at B01-1 to B01-4 and B02-1 to B02-4
• No steam shortages expected on existing pads
Steam strategy 2016

• Phase F OTSG adding 14,453 m³/d incremental capacity, bringing total capacity to 60,672 m³/d
• Two additional pads planned to start up with Phase F OTSG: H01, H03
  • total of 24 well pairs
• The following pads are planned to start up for sustaining production: B10, J03, L03, J01, B06 Wedge Well™ technology
  • total of 39 well pairs and nine wells using Wedge Well™ technology
• Rampdown/blowdown operations:
  • plan to continue at A01 pad
  • plan to continue at B01-1 to B01-4 and B02-1 to B02-4
  • plan to commence on B03, B04, B07 pad
• No steam shortages expected on existing pads
Appendix 1
Subsection 3.1.1 – 2) Heave data
Cumulative vertical deformation:
July 2, 2008 to October 23, 2014 (~76 months)
Cumulative vertical deformation:
May 18, 2012 to October 23, 2014 (~29 months)
Cumulative vertical deformation:
May 13, 2013 to October 23, 2014 (~17 months)
Cumulative vertical deformation:
April 14, 2014 to October 23, 2014 (~6 months)
Cumulative vertical deformation: Phase C/D/E

May 18, 2012 to October 23, 2014: Photo 1
May 13, 2013 to October 23, 2014: Photo 2
April 14, 2014 to October 23, 2014: Photo 3

(~29 months)  (~17 months)  (~6 months)
Geomechanical and surface heave (Coherent Targets)
Geomechanical and surface heave (Coherent Targets)

Semi-Annual Vertical Deformation: Corner Reflectors and CTM
April 14, 2014 to October 23, 2014

© 2015 Cenovus Energy Inc.
June 24, 2015 163
Cumulative vertical deformation: Phase A

July 2, 2008 to October 23, 2014 (~76 months)

- Little to no deformation on CR 8 & 23
- 7 Corner Reflectors removed due to expanding infrastructure
Cumulative vertical deformation: Phase B

July 2, 2008 to October 23, 2014 (~76 months)

Reference CRs

Measured CRs

~140 mm

~176 mm cum. uplift

~5 years
Cumulative vertical deformation: Phase C/D

May 18, 2012 to October 23, 2014

- Greatest uplift observed over the B03, B04, and B05 pads was as high as 124mm (CR#51)
- Vertical deformation over B03, B04, and B05 ranged between 20mm-124mm
- Greatest uplift observed over B06 was ~75mm (CR #63)
Cumulative vertical deformation: Phase E

April 14, 2014 to October 23, 2014 (~6 months)

Reference CR

Measured CRs

© 2015 Cenovus Energy Inc.  
June 24, 2015
Appendix 2
Subsection 3.1.1 – 5d)
Piezometer data
## Piezometer summary

<table>
<thead>
<tr>
<th>UWII</th>
<th>Year Landed</th>
<th>Cemented or Hanging</th>
<th>TVD</th>
<th>Piezometer Location</th>
<th>Pad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1AA/6-35-75-6W4/00</td>
<td>2011</td>
<td>Cemented</td>
<td>254.5</td>
<td>Water</td>
<td>Clearwater</td>
</tr>
<tr>
<td>100/7-36-75-6W4/00</td>
<td>2011</td>
<td>Cemented</td>
<td>263.0</td>
<td>Water</td>
<td>Clearwater</td>
</tr>
<tr>
<td>100/10-34-75-6W4/00</td>
<td>2013</td>
<td>Hanging</td>
<td>419.0</td>
<td>Water</td>
<td>McMurray BW</td>
</tr>
<tr>
<td>100/12-18-76-5W4/00</td>
<td>2010</td>
<td>Cemented</td>
<td>300.0</td>
<td>Water</td>
<td>Clearwater</td>
</tr>
<tr>
<td>1AA/6-2-76-6W4/00</td>
<td>2002</td>
<td>Cemented</td>
<td>342.5</td>
<td>Gas</td>
<td>CO6 Pad</td>
</tr>
<tr>
<td>102/3-5-76-6W4/00</td>
<td>2005</td>
<td>Hanging</td>
<td>418.5</td>
<td>Water</td>
<td>McMurray BW</td>
</tr>
<tr>
<td>100/07-10-76-6W4/00</td>
<td>2011</td>
<td>Cemented</td>
<td>330.0</td>
<td>Gas</td>
<td>CO2 Pad</td>
</tr>
<tr>
<td>100/14-10-76-6W4/00</td>
<td>2011</td>
<td>Cemented</td>
<td>337.3</td>
<td>Gas</td>
<td>CO1 Pad</td>
</tr>
<tr>
<td>102/8-11-076-6W4/00</td>
<td>2012</td>
<td>Cemented</td>
<td>335.0</td>
<td>Gas</td>
<td>B03 Pad</td>
</tr>
<tr>
<td>100/12-11-76-6W4/00</td>
<td>2008</td>
<td>Cemented</td>
<td>337.5</td>
<td>Gas</td>
<td>B03 Pad</td>
</tr>
<tr>
<td>100/9-13-76-6W4/00</td>
<td>2005</td>
<td>Cemented</td>
<td>337.5</td>
<td>Gas</td>
<td>B03 Pad</td>
</tr>
</tbody>
</table>

© 2015 Cenovus Energy Inc.
June 24, 2015
### Piezometer summary

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Year</th>
<th>Status</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Pad</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/1-14-76-6W4/00</td>
<td>2008</td>
<td>Cemented</td>
<td>323.5</td>
<td>Gas</td>
<td>B04 Pad</td>
</tr>
<tr>
<td>100/2-14-76-6W4/00</td>
<td>2008</td>
<td>Cemented</td>
<td>345.0</td>
<td>Gas</td>
<td>B04 Pad</td>
</tr>
<tr>
<td>100/2-14-76-6W4/00</td>
<td>2008</td>
<td>Cemented</td>
<td>355.0</td>
<td>SAGD</td>
<td>B04 Pad</td>
</tr>
<tr>
<td>100/3-14-76-6W4/00</td>
<td>2011</td>
<td>Cemented</td>
<td>372.0</td>
<td>SAGD</td>
<td>B04 Pad</td>
</tr>
<tr>
<td>100/4-14-76-6W4/00</td>
<td>2011</td>
<td>Cemented</td>
<td>402.0</td>
<td>Water</td>
<td>B04 Pad</td>
</tr>
<tr>
<td>100/5-14-76-6W4/00</td>
<td>2012</td>
<td>Cemented</td>
<td>379.2</td>
<td>Water</td>
<td>Clearwater</td>
</tr>
<tr>
<td>100/6-14-76-6W4/00</td>
<td>2013</td>
<td>Cemented</td>
<td>332.0</td>
<td>Gas</td>
<td>B11 Pad</td>
</tr>
<tr>
<td>100/7-14-76-6W4/00</td>
<td>2013</td>
<td>Cemented</td>
<td>344.5</td>
<td>Gas</td>
<td>B11 Pad</td>
</tr>
<tr>
<td>100/8-14-76-6W4/00</td>
<td>2013</td>
<td>Cemented</td>
<td>382.0</td>
<td>SAGD</td>
<td>B11 Pad</td>
</tr>
<tr>
<td>100/9-14-76-6W4/00</td>
<td>2013</td>
<td>Cemented</td>
<td>385.0</td>
<td>SAGD</td>
<td>B11 Pad</td>
</tr>
<tr>
<td>100/10-03-76-6W4/00</td>
<td>2013</td>
<td>Cemented</td>
<td>395.0</td>
<td>Water</td>
<td>B01 Pad</td>
</tr>
<tr>
<td>100/15-03-76-6W4/00</td>
<td>2013</td>
<td>Cemented</td>
<td>275.0</td>
<td>Water</td>
<td>B01 Pad</td>
</tr>
<tr>
<td>100/16-03-76-6W4/00</td>
<td>2013</td>
<td>Cemented</td>
<td>300.0</td>
<td>Water</td>
<td>B01 Pad</td>
</tr>
<tr>
<td>100/17-03-76-6W4/00</td>
<td>2014</td>
<td>Cemented</td>
<td>331.5</td>
<td>Wabiskaw</td>
<td>Broken</td>
</tr>
<tr>
<td>100/18-03-76-6W4/00</td>
<td>2014</td>
<td>Cemented</td>
<td>333.5</td>
<td>Wabiskaw</td>
<td>Broken</td>
</tr>
<tr>
<td>100/19-03-76-6W4/00</td>
<td>2014</td>
<td>Cemented</td>
<td>335.5</td>
<td>Wabiskaw</td>
<td>Broken</td>
</tr>
<tr>
<td>1AB/14-14-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>337.0</td>
<td>Wabiskaw</td>
<td>Wabiskaw</td>
</tr>
<tr>
<td>1AB/13-13-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>237.0</td>
<td>Water</td>
<td>Wabiskaw</td>
</tr>
<tr>
<td>1AB/13-13-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>239.0</td>
<td>Water</td>
<td>Wabiskaw</td>
</tr>
<tr>
<td>1AB/13-13-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>290.0</td>
<td>Water</td>
<td>Wabiskaw</td>
</tr>
<tr>
<td>1AB/13-13-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>395.0</td>
<td>Water</td>
<td>Wabiskaw</td>
</tr>
</tbody>
</table>
## Piezometer summary

<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>Type</th>
<th>Depth (m)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1AB/01-10-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>244.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/01-10-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>296.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/01-10-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>402.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AA/12-03-75-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>259.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AA/12-03-75-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>307.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AA/12-03-75-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>422.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/01-02-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>265.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/01-02-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>379.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/01-02-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>434.0</td>
<td>SAGD</td>
</tr>
<tr>
<td>1AB/15-14-75-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>448.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/11-14-75-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>221.0</td>
<td>No SCADA</td>
</tr>
<tr>
<td>1AB/11-14-75-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>277.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AC/06-02-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>265.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AC/06-02-76-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>363.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/03-14-75-6W4</td>
<td>2014</td>
<td>Cemented</td>
<td>410.0</td>
<td>Water</td>
</tr>
<tr>
<td>100/11-15-76-6W4</td>
<td>2014</td>
<td>Hanging</td>
<td>335.0</td>
<td>Wabiskaw</td>
</tr>
<tr>
<td>100/11-15-76-6W4</td>
<td>2014</td>
<td>Hanging</td>
<td>225.0</td>
<td>Wabiskaw</td>
</tr>
<tr>
<td>1AB/13-14-76-6W4/0</td>
<td>2015</td>
<td>Cemented</td>
<td>270.0</td>
<td>Gas</td>
</tr>
<tr>
<td>1OB/03-14-76-6W4/0</td>
<td>2012</td>
<td>Hanging</td>
<td>283.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AC/16-11-76-6W4/0</td>
<td>2014</td>
<td>Cemented</td>
<td>331.5</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/16-03-76-6W4/0</td>
<td>2014</td>
<td>Cemented</td>
<td>248.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/03-02-76-6W4/0</td>
<td>2014</td>
<td>Cemented</td>
<td>299.0</td>
<td>Water</td>
</tr>
<tr>
<td>1AB/03-02-76-6W4/0</td>
<td>2014</td>
<td>Cemented</td>
<td>322.0</td>
<td>Water</td>
</tr>
</tbody>
</table>
Broken Downhole
Piezometer Not Working
00/11-15-076-06W4/0

Pressure (kPa)


AB/15-14-076-06W4/0

No SCADA Installed

Pressure (kPa)


284 mkb  225 mkb
Appendix 3
Subsection 3.1.1 – 5d)

RST & observation temperature data
## Thermocouples in observation wells

<table>
<thead>
<tr>
<th>Well UWI</th>
<th>Top T/C Depth (MD)</th>
<th>Bottom T/C Depth (MD)</th>
<th># Points</th>
<th>Well Observed</th>
<th>Observed Well Section</th>
<th>Needs Work</th>
<th>Instrumentation TVD of SAGD Producer (mKb)</th>
<th>Instrumentation TVD of SAGD Injector (mKb)</th>
<th>Lateral Offset to SAGD Producer (m)</th>
<th>Lateral Offset to SAGD Injector (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>104/03-16-076-06W4</td>
<td>319</td>
<td>390</td>
<td>32</td>
<td>A022</td>
<td>Heel</td>
<td>N</td>
<td>389</td>
<td>384</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>102/05-15-076-06W4</td>
<td>334</td>
<td>406</td>
<td>36</td>
<td>B013</td>
<td>Heel</td>
<td>N</td>
<td>380</td>
<td>374</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>102/06-15-076-06W4</td>
<td>340</td>
<td>390</td>
<td>26</td>
<td>B013</td>
<td>Toe</td>
<td>N</td>
<td>385</td>
<td>381</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>104/06-15-076-06W4</td>
<td>344</td>
<td>394</td>
<td>26</td>
<td>B014</td>
<td>Middle</td>
<td>N</td>
<td>378</td>
<td>372</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>103/05-15-076-06W4</td>
<td>323</td>
<td>385</td>
<td>32</td>
<td>B021</td>
<td>Mid</td>
<td>N</td>
<td>377</td>
<td>371</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>102/12-15-076-06W4</td>
<td>344</td>
<td>406</td>
<td>32</td>
<td>B022</td>
<td>Heel</td>
<td>N</td>
<td>382</td>
<td>377</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>100/11-15-076-06W4</td>
<td>350</td>
<td>400</td>
<td>26</td>
<td>B024</td>
<td>Toe</td>
<td>N</td>
<td>381</td>
<td>376</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>102/10-11-076-06W4</td>
<td>346</td>
<td>396</td>
<td>27</td>
<td>B032</td>
<td>Heel</td>
<td>N</td>
<td>387</td>
<td>383</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/16-11-076-06W4</td>
<td>347</td>
<td>407</td>
<td>30</td>
<td>B033</td>
<td>Heel</td>
<td>N</td>
<td>389</td>
<td>384</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/13-12-076-06W4</td>
<td>344</td>
<td>406</td>
<td>30</td>
<td>B035</td>
<td>Heel</td>
<td>N</td>
<td>391</td>
<td>386</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/09-11-076-06W4</td>
<td>350</td>
<td>408</td>
<td>31</td>
<td>B036</td>
<td>Heel</td>
<td>N</td>
<td>390</td>
<td>385</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/01-14-076-06W4</td>
<td>341</td>
<td>387</td>
<td>24</td>
<td>B041</td>
<td>Heel</td>
<td>N</td>
<td>382</td>
<td>379</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/02-14-076-06W4</td>
<td>340</td>
<td>394</td>
<td>28</td>
<td>B042</td>
<td>Toe</td>
<td>Y</td>
<td>384</td>
<td>379</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/07-14-076-06W4</td>
<td>337</td>
<td>391</td>
<td>28</td>
<td>B045</td>
<td>Heel</td>
<td>N</td>
<td>385</td>
<td>380</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/03-14-076-06W4</td>
<td>336</td>
<td>390</td>
<td>28</td>
<td>B046</td>
<td>Toe</td>
<td>N</td>
<td>386</td>
<td>381</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/15-11-076-06W4</td>
<td>338</td>
<td>390</td>
<td>27</td>
<td>B052</td>
<td>Heel</td>
<td>N</td>
<td>385</td>
<td>380</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>102/15-11-076-06W4</td>
<td>335</td>
<td>403</td>
<td>34</td>
<td>B053</td>
<td>Mid</td>
<td>N</td>
<td>384</td>
<td>378</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/11-15-076-06W4</td>
<td>335</td>
<td>391</td>
<td>29</td>
<td>B056</td>
<td>Toe</td>
<td>Y</td>
<td>389</td>
<td>385</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/14-11-076-06W4</td>
<td>340</td>
<td>394</td>
<td>28</td>
<td>B058</td>
<td>Heel</td>
<td>N</td>
<td>384</td>
<td>379</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/05-13-076-06W4</td>
<td>321.5</td>
<td>394</td>
<td>30</td>
<td>B072</td>
<td>Toe</td>
<td>N</td>
<td>388</td>
<td>384</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/06-13-076-06W4</td>
<td>342</td>
<td>396</td>
<td>27</td>
<td>B076</td>
<td>Toe</td>
<td>Y</td>
<td>395</td>
<td>390</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/03-15-076-06W4</td>
<td>293</td>
<td>351</td>
<td>30</td>
<td>B077</td>
<td>Toe</td>
<td>N</td>
<td>377</td>
<td>372</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>103/03-15-076-06W4</td>
<td>337</td>
<td>395</td>
<td>30</td>
<td>B077</td>
<td>Toe</td>
<td>N</td>
<td>377</td>
<td>372</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>100/04-15-076-06W4</td>
<td>333</td>
<td>363</td>
<td>30</td>
<td>B077</td>
<td>Toe</td>
<td>N</td>
<td>377</td>
<td>372</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/04-15-076-06W4</td>
<td>334</td>
<td>394</td>
<td>30</td>
<td>B077</td>
<td>Heel</td>
<td>N</td>
<td>377</td>
<td>372</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>103/04-15-076-06W4</td>
<td>335</td>
<td>395</td>
<td>30</td>
<td>B077</td>
<td>Heel</td>
<td>N</td>
<td>377</td>
<td>372</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>104/04-15-076-06W4</td>
<td>336</td>
<td>396</td>
<td>30</td>
<td>B077</td>
<td>Heel</td>
<td>N</td>
<td>377</td>
<td>372</td>
<td>70</td>
<td>70</td>
</tr>
</tbody>
</table>
## Thermocouples in observation wells

<table>
<thead>
<tr>
<th>Well UWI</th>
<th>Top T/C Depth (MD)</th>
<th>Bottom T/C Depth (MD)</th>
<th># Points</th>
<th>Well Observed</th>
<th>Observed Well Section</th>
<th>Needs Work</th>
<th>Instrumentation TVD of SAGD Producer (mKb)</th>
<th>Instrumentation TVD of SAGD Injector (mKb)</th>
<th>Lateral Offset to SAGD Producer (m)</th>
<th>Lateral Offset to SAGD Injector (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/12-15-076-6W4</td>
<td>329</td>
<td>385</td>
<td>29</td>
<td>B026</td>
<td>Heel</td>
<td>N</td>
<td>380</td>
<td>375</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>1AA/15-15-076-6W4</td>
<td>329</td>
<td>385</td>
<td>23</td>
<td>B027</td>
<td>Toe</td>
<td>N</td>
<td>380</td>
<td>375</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>100/13-15-076-6W4</td>
<td>327</td>
<td>385</td>
<td>24</td>
<td>B029</td>
<td>Heel</td>
<td>N</td>
<td>374</td>
<td>368</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>1AA/13-11-076-6W4</td>
<td>330</td>
<td>394</td>
<td>32</td>
<td>B058</td>
<td>Mid</td>
<td>Y</td>
<td>380</td>
<td>375</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>102/14-11-076-6W4</td>
<td>340</td>
<td>398</td>
<td>30</td>
<td>B058</td>
<td>Heel</td>
<td>N</td>
<td>384</td>
<td>379</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>103/06-12-76-6W4</td>
<td>349</td>
<td>407</td>
<td>28</td>
<td>B062</td>
<td>Toe</td>
<td>Y</td>
<td>391</td>
<td>386</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/06-12-76-6W4</td>
<td>345</td>
<td>407</td>
<td>27</td>
<td>B064</td>
<td>Mid</td>
<td>N</td>
<td>391</td>
<td>386</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>102/05-12-76-6W4</td>
<td>348</td>
<td>402</td>
<td>24</td>
<td>B067</td>
<td>Heel</td>
<td>N</td>
<td>394</td>
<td>390</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100/11-12-76-6W4</td>
<td>345</td>
<td>403</td>
<td>30</td>
<td>B067</td>
<td>Heel</td>
<td>N</td>
<td>397</td>
<td>392</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/11-14-76-6W4</td>
<td>344</td>
<td>392</td>
<td>40</td>
<td>B11-7</td>
<td>Mid</td>
<td>Y</td>
<td>377</td>
<td>372</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>102/05-14-76-6W4</td>
<td>334</td>
<td>386</td>
<td>27</td>
<td>B11-5</td>
<td>Mid</td>
<td>Y</td>
<td>377</td>
<td>372</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>100/05-14-76-6W4</td>
<td>329</td>
<td>390</td>
<td>27</td>
<td>B11-4</td>
<td>Mid</td>
<td>N</td>
<td>375</td>
<td>369</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>103/05-14-76-6W4</td>
<td>332</td>
<td>390</td>
<td>25</td>
<td>B11-3</td>
<td>Mid</td>
<td>N</td>
<td>375</td>
<td>370</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>100/01-15-76-6W4</td>
<td>325</td>
<td>387</td>
<td>32</td>
<td>B08-4</td>
<td>Heel</td>
<td>Y</td>
<td>375</td>
<td>370</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/01-15-76-6W4</td>
<td>323</td>
<td>385</td>
<td>32</td>
<td>B08-3</td>
<td>Mid</td>
<td>N</td>
<td>378</td>
<td>372</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>100/13-11-76-6W4</td>
<td>344</td>
<td>394</td>
<td>26</td>
<td>B08-7</td>
<td>Mid</td>
<td>N</td>
<td>379</td>
<td>374</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>108/12-11-76-6W4</td>
<td>332</td>
<td>390</td>
<td>30</td>
<td>B08-10</td>
<td>Toe</td>
<td>N</td>
<td>382</td>
<td>376</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>102/11-14-76-6W4</td>
<td>260</td>
<td>305</td>
<td>20</td>
<td>B11-11</td>
<td>Mid</td>
<td>Y</td>
<td>378</td>
<td>373</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>100/12-13-76-6W4</td>
<td>350</td>
<td>400</td>
<td>25</td>
<td>F01-9</td>
<td>Mid</td>
<td>Y</td>
<td>394</td>
<td>385</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>100/14-13-76-6W4</td>
<td>340</td>
<td>394</td>
<td>27</td>
<td>F01-7 F01-8</td>
<td>Heel</td>
<td>N</td>
<td>391</td>
<td>384</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>101/13-13-76-6W4</td>
<td>340</td>
<td>400</td>
<td>25</td>
<td>F01-4 F01-5</td>
<td>Heel</td>
<td>N</td>
<td>384</td>
<td>388</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>108/06-13-76-6W4</td>
<td>340</td>
<td>393</td>
<td>28</td>
<td>F01-1 F01-2</td>
<td>Mid</td>
<td>Y</td>
<td>390</td>
<td>385</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>102/15-12-76-6W4</td>
<td>270</td>
<td>310</td>
<td>26</td>
<td>B06</td>
<td>Build</td>
<td>N</td>
<td>333</td>
<td>328</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>102/15-12-76-6W4</td>
<td>313</td>
<td>390</td>
<td>14</td>
<td>B09-6</td>
<td>Mid</td>
<td>Y</td>
<td>392</td>
<td>387</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>102/01-13-76-6W4</td>
<td>340</td>
<td>390</td>
<td>25</td>
<td>B09-1</td>
<td>Heel</td>
<td>Y</td>
<td>390</td>
<td>385</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>100/02-13-76-6W4</td>
<td>340</td>
<td>395</td>
<td>28</td>
<td>B09-4 B09-5</td>
<td>Heel</td>
<td>Y</td>
<td>387</td>
<td>382</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>102/02-13-76-6W4</td>
<td>350</td>
<td>400</td>
<td>26</td>
<td>B09-8 B09-7</td>
<td>Build</td>
<td>Y</td>
<td>373</td>
<td>368</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>100/07-13-76-6W4</td>
<td>350</td>
<td>395</td>
<td>24</td>
<td>B09-10</td>
<td>Build</td>
<td>Y</td>
<td>380</td>
<td>375</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>100/02-16-076-06W4</td>
<td>400</td>
<td>330</td>
<td>30</td>
<td>A02-4</td>
<td>Heel</td>
<td>N</td>
<td>387</td>
<td>382</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>100/01-16-076-06W4</td>
<td>395</td>
<td>325</td>
<td>30</td>
<td>A02-4</td>
<td>Toe</td>
<td>N</td>
<td>385</td>
<td>380</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

© 2015 Cenovus Energy Inc.  
June 24, 2015
RST logs
B01 pad
<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR</td>
<td>UNKNO1500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth</th>
<th>Resistivity</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;MD</td>
<td>AHT80</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>0.2</td>
<td>UNKNO120000</td>
<td>T_Feb13</td>
</tr>
<tr>
<td>TVDSS</td>
<td>AHT60</td>
<td>T_Jan12</td>
</tr>
<tr>
<td>0.2</td>
<td>UNKNO120000</td>
<td>T_Jan12</td>
</tr>
</tbody>
</table>

© 2015 Cenovus Energy Inc.
June 24, 2015

© 2015 Cenovus Energy Inc.
June 24, 2015
<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
<th>Depth</th>
<th>Resistivity</th>
<th>RST.SO</th>
<th>RST.SG</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR</td>
<td></td>
<td>0</td>
<td>AQH00</td>
<td>SQ_2013</td>
<td>SQ_2013</td>
<td>T_Mar14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10206</td>
<td></td>
<td>10</td>
<td>10</td>
<td>UNKNOWN 300</td>
</tr>
<tr>
<td>TVD(55)</td>
<td></td>
<td>0</td>
<td>AQH00</td>
<td>SQ_2012</td>
<td>SQ_2012</td>
<td>T_Jan10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10700</td>
<td></td>
<td>10</td>
<td>10</td>
<td>UNKNOWN 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20000</td>
<td></td>
<td>10</td>
<td>10</td>
<td>UNKNOWN 300</td>
</tr>
</tbody>
</table>

© 2015 Cenovus Energy Inc.
June 24, 2015
RST logs
B02 pad
(Btw half B021-11) 100051507606W400

<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
<th>Depth</th>
<th>Resistivity</th>
<th>RST.SO</th>
<th>RST.SG</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GR</td>
<td>&lt;MD</td>
<td>AHT90</td>
<td>SO.2014</td>
<td>SG.2014</td>
<td>TEMP.2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.2 OHMM 2000</td>
<td>10</td>
<td>10</td>
<td>300 degC</td>
</tr>
<tr>
<td></td>
<td>TVDSS</td>
<td></td>
<td>AHT90</td>
<td>SO.2013</td>
<td>SG.2013</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.2 OHMM 2000</td>
<td>10</td>
<td>10</td>
<td>300 degC</td>
</tr>
</tbody>
</table>

B011 INJ/PROD location(SS): 199.1/193.1
B02W03 INJ/PROD location(SS): 196/201
B021 INJ/PROD location(SS): 201.9/195.6
<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
<th>Depth</th>
<th>Resistivity</th>
<th>RST_SO</th>
<th>RST_SG</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>GAPI1500</td>
<td>0.2</td>
<td>CHMM 200000</td>
<td>unitless</td>
<td>10</td>
<td>unitless</td>
</tr>
<tr>
<td>TVD99.7</td>
<td>ANTOO</td>
<td>10</td>
<td>CHMM 200000</td>
<td>unitless</td>
<td>10</td>
<td>unitless</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>SO_2013</td>
<td>SO_2013</td>
<td>10</td>
<td>SO_2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.2</td>
<td>VV</td>
<td>VV</td>
<td>10</td>
<td>VV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>SO_2011</td>
<td>SO_2011</td>
<td>10</td>
<td>SO_2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>unitless</td>
<td>unitless</td>
<td>10</td>
<td>unitless</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>SO_2014</td>
<td>SO_2014</td>
<td>10</td>
<td>SO_2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>VV</td>
<td>VV</td>
<td>10</td>
<td>VV</td>
</tr>
</tbody>
</table>

© 2015 Cenovus Energy Inc.
June 24, 2015
### B36H (B036 HEEL) 100091107606W400

<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
<th>Depth</th>
<th>Resistivity</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>CAP150</td>
<td>MD</td>
<td>0.2 OHMM 20000</td>
<td>UNKNOWN 300</td>
</tr>
<tr>
<td>0</td>
<td>TVDS5</td>
<td>TVDS5</td>
<td>0.2 OHMM 20000</td>
<td>UNKNOWN 300</td>
</tr>
</tbody>
</table>

---

**Note:**

- The diagram illustrates various geological layers and their properties, including depth, resistivity, and temperature readings.
- The color coding represents different types of geological formations, with green indicating oil.

**Source:**

© 2015 Cenovus Energy Inc.

June 24, 2015
RST logs
B04 pad
No thermo data or RST after 2012
RST logs
B05 pad
<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
<th>Depth</th>
<th>Resistivity</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR</td>
<td></td>
<td></td>
<td>AHT90</td>
<td>T-Feb14</td>
</tr>
<tr>
<td>0</td>
<td>GAP15</td>
<td>250</td>
<td>0.2 OHMM</td>
<td>2000000</td>
</tr>
<tr>
<td>TVDSS</td>
<td></td>
<td>240</td>
<td>AHT60</td>
<td>T-Feb13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>235</td>
<td>0.2 OHMM</td>
<td>2000000</td>
</tr>
</tbody>
</table>

- **B52H (B052 HEEL) 100151107606W400**

![Graphical representation of the data](image-url)
RST logs
B06 pad
<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
<th>Depth</th>
<th>Resistivity</th>
<th>RST_SO</th>
<th>RST_SG</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>GGR(GRN)</td>
<td>&lt;MD</td>
<td>3.2</td>
<td>O-HM 200000</td>
<td>10</td>
<td>10</td>
<td>UNKNOWN 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AHTS(RILD)</td>
<td>SQ_2014</td>
<td>SG_2014</td>
<td>T-Febr14</td>
</tr>
<tr>
<td>TVU5</td>
<td></td>
<td></td>
<td>O-HM 200000</td>
<td>10</td>
<td>10</td>
<td>UNKNOWN 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AHTS(RILD)</td>
<td>SQ_2012</td>
<td>SG_2012</td>
<td>T-FEB12</td>
</tr>
</tbody>
</table>

© 2015 Cenovus Energy Inc.
June 24, 2015

262
<table>
<thead>
<tr>
<th>Correlation</th>
<th>FACIE</th>
<th>Depth</th>
<th>Resistivity</th>
<th>RST_SO</th>
<th>RST_SO</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR(GRM)</td>
<td>MD</td>
<td></td>
<td>AHT99(RRLD)</td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>0 GAP1500</td>
<td></td>
<td>20000</td>
<td>OHMM</td>
<td>10</td>
<td>10</td>
<td>DEGC 300</td>
</tr>
<tr>
<td>TVDSS</td>
<td></td>
<td>20000</td>
<td>OHMM</td>
<td>undefined</td>
<td>10</td>
<td>DEGC 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Mar13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TEMP2014</td>
<td>TEMP2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SC_2012</td>
<td>SC_2012</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>SAGD PAY TO</td>
<td></td>
<td></td>
<td></td>
<td>SC_2012</td>
<td>SC_2012</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>370</td>
<td></td>
<td>210</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>375</td>
<td></td>
<td>205</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>380</td>
<td></td>
<td>200</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>386</td>
<td></td>
<td>195</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>390</td>
<td></td>
<td>190</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>395</td>
<td></td>
<td>185</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>400</td>
<td></td>
<td>180</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>410</td>
<td></td>
<td>160</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>SAGD Base</td>
<td></td>
<td>175</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>420</td>
<td></td>
<td>165</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>430</td>
<td></td>
<td>150</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>440</td>
<td></td>
<td>145</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>450</td>
<td></td>
<td>140</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>460</td>
<td></td>
<td>135</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>470</td>
<td></td>
<td>130</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>480</td>
<td></td>
<td>125</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>490</td>
<td></td>
<td>120</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>500</td>
<td></td>
<td>115</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>510</td>
<td></td>
<td>110</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>520</td>
<td></td>
<td>105</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>530</td>
<td></td>
<td>100</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>540</td>
<td></td>
<td>95</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>550</td>
<td></td>
<td>90</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>560</td>
<td></td>
<td>85</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>570</td>
<td></td>
<td>80</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>580</td>
<td></td>
<td>75</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>590</td>
<td></td>
<td>70</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>600</td>
<td></td>
<td>65</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>610</td>
<td></td>
<td>60</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>620</td>
<td></td>
<td>55</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>630</td>
<td></td>
<td>50</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>640</td>
<td></td>
<td>45</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>650</td>
<td></td>
<td>40</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>660</td>
<td></td>
<td>35</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>670</td>
<td></td>
<td>30</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>680</td>
<td></td>
<td>25</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>690</td>
<td></td>
<td>20</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>700</td>
<td></td>
<td>15</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>710</td>
<td></td>
<td>10</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>720</td>
<td></td>
<td>5</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
<tr>
<td>730</td>
<td></td>
<td>0</td>
<td></td>
<td>SC_2014</td>
<td>SC_2014</td>
<td>T_Feb14</td>
</tr>
</tbody>
</table>
RST logs
B07 pad
<table>
<thead>
<tr>
<th>Correlation GR (GRGM)</th>
<th>PAGIE</th>
<th>Depth (MD)</th>
<th>Resistivity AHT90 (RILD)</th>
<th>Resistivity AHT60 (RILM)</th>
<th>Temperature T - Feb14</th>
<th>Temperature T - Feb13</th>
<th>Temperature T - Aug12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.2 OHMM 20000 0</td>
<td>0.2 OHMM 20000 0</td>
<td>UNKNOWN 300</td>
<td>UNKNOWN 300</td>
<td>UNKNOWN 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

© 2015 Cenovus Energy Inc.
June 24, 2015
RST logs
B11 pad
Appendix 4
Subsection 3.1.1 – 5d)
Injection pressures
B04 Pad

Pressure (kPa)


B0401  B0402  B0403  B0404  B0405  B0406  B0407  B0408
Appendix 5
Subsection 3.1.1 – 7h)
Pad production data
Christina Lake A02 Pad Performance

- Oil Rate (m³/d)
- Water Rate (m³/d)
- Steam inj Rate (m³/d)
- Pad Pressure (kPa)
- ISOR
- CSOR
- Produced Gas Rate (e³m³/d)
- Average # of Producing Wells

Graph showing various performance metrics over different months.
Christina Lake
B09 Pad Performance

- Oil Rate (m³/d)
- Water Rate (m³/d)
- Steam Inj Rate (m³/d)
- Pad Pressure (kPa)
- ISOR
- CSOR
- Produced Gas Rate (m³/d)
- Average # of Producing Wells

Graph shows the performance metrics over time from July 14 to May 15.
Oil & gas and financial information

The estimates of reserves and contingent resources were prepared effective December 31, 2014 and the estimates of bitumen initially-in-place were prepared effective December 31, 2012. All estimates were prepared by independent qualified reserves evaluators, based on definitions contained in the Canadian Oil and Gas Evaluation Handbook and in accordance with National Instrument 51-101. Additional information with respect to the significant factors relevant to the resources estimates, the specific contingencies which prevent the classification of the contingent resources as reserves, pricing and additional reserves and other oil and gas information, including the material risks and uncertainties associated with reserves and resources estimates, is contained in our AIF and Form 40-F for the year ended December 31, 2014, available on SEDAR at www.sedar.com, EDGAR at www.sec.gov and on our website at cenovus.com.

There is no certainty that it will be commercially viable to produce any portion of the contingent resources. There is no certainty that any portion of the prospective resources will be discovered. If discovered, there is no certainty that it will be commercially viable to produce any portion of those resources. Actual resources may be greater than or less than the estimates provided.

Total bitumen initially-in-place (BIIP) estimates, and all subcategories thereof, including the definitions associated with the categories and estimates, are disclosed and discussed in our July 24, 2013 news release, available on SEDAR at sedar.com and at cenovus.com. BIIP estimates include unrecoverable volumes and are not an estimate of the volume of the substances that will ultimately be recovered. Cumulative production, reserves and contingent resources are disclosed on a before royalties basis. All estimates are best estimate, billion barrels (Bbbls). Total BIIP (143 Bbbls); discovered BIIP (93 Bbbls); commercial discovered BIIP equals the cumulative production (0.1 Bbbls) plus reserves (2.4 Bbbls); sub-commercial discovered BIIP equals economic contingent resources (9.6 Bbbls) plus the unrecoverable portion of discovered BIIP (81 Bbbls); undiscovered BIIP (50 Bbbls); prospective resources (8.5 Bbbls); unrecoverable portion of undiscovered BIIP (42 Bbbls). Any contingent resources as at December 31, 2012 that are sub-economic or that are classified as being subject to technology under development have been grouped into the unrecoverable portion of discovered BIIP. Petroleum initially-in-place (PIIP) estimates for Pelican Lake are effective December 31, 2012 and were prepared by McDaniel. All estimates are best estimate discovered PIIP volumes as follows: Mobile Wabiskaw total PIIP (2.11 Bbbls); discovered PIIP (2.11 Bbbls); cumulative production (0.11 Bbbls); reserves (0.25 Bbbls); contingent resources (0.03 Bbbls); unrecoverable discovered PIIP (1.72 Bbbls); undiscovered PIIP (0 Bbbls). Mobile Wabiskaw development area total PIIP (1.62 Bbbls); discovered PIIP (1.62 Bbbls); cumulative production (0.11 Bbbls); reserves (0.25 Bbbls); contingent resources (0 Bbbls); unrecoverable discovered PIIP (1.26 Bbbls); undiscovered PIIP (0 Bbbls). Immobile Wabiskaw total PIIP (1.33 Bbbls); discovered PIIP (1.33 Bbbls); cumulative production (0 Bbbls); reserves (0 Bbbls); contingent resources (0 Bbbls); unrecoverable discovered PIIP (1.33 Bbbls); undiscovered PIIP (0 Bbbls).

Certain natural gas volumes have been converted to barrels of oil equivalent (BOE) on the basis of one barrel (bbl) to six thousand cubic feet (Mcf). BOE may be misleading, particularly if used in isolation. A conversion ratio of one bbl to six Mcf is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent value equivalency at the well head.

Non-GAAP measures

Certain financial measures in this document do not have a standardized meaning as prescribed by IFRS such as, Operating Cash Flow, Cash Flow, Operating Earnings, Free Cash Flow, Debt, Net Debt, Capitalization and Adjusted Earnings before Interest, Taxes, Depreciation and Amortization ("Adjusted EBITDA") and therefore are considered non-GAAP measures. These measures may not be comparable to similar measures presented by other issuers. These measures have been described and presented in order to provide shareholders and potential investors with additional measures for analyzing our ability to generate funds to finance our operations and information regarding our liquidity. This additional information should not be considered in isolation or as a substitute for measures prepared in accordance with IFRS. Readers are encouraged to review our most recent Management's Discussion and Analysis, available at cenovus.com for a full discussion of the use of each measure.

TM denotes a trademark of Cenovus Energy Inc.
© 2015 Cenovus Energy Inc.
Advisory

This document contains forward-looking information prepared and submitted pursuant to Alberta regulatory requirements and is not intended to be relied upon for the purpose of making investment decisions, including without limitation, to purchase, hold or sell any securities of Cenovus Energy Inc. Certain resources estimates contained herein are not reported in accordance with National Instrument 51-101 and are provided solely for the purpose of complying with Alberta regulatory requirements.

Additional information regarding Cenovus Energy Inc. is available at cenovus.com
Strong integrated portfolio

TSX, NYSE | CVE

<table>
<thead>
<tr>
<th>Enterprise value</th>
<th>C$25 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shares outstanding</td>
<td>829 MM</td>
</tr>
</tbody>
</table>

2015F production

| Oil & NGLs       | 204 Mbbls/d |
| Natural gas     | 438 MMcf/d  |

2014 proved & probable reserves 3.9 BBOE

Bitumen

| Economic contingent resources* | 9.3 Bbbls |
| Discovered bitumen initially in place* | 93 Bbbls |
| Lease rights**                 | 1.5 MM net acres |

P&NG rights 5.6 MM net acres

Refining capacity 230 Mbbls/d net

Values are approximate. Forecast production based on midpoints of January 28, 2015 guidance. Cenovus land at December 31, 2014. *See advisory. **Includes an additional 0.5 million net acres of exclusive lease rights to lease on our behalf and our assignee’s behalf.
Area Map
Subsection 3.1.2 – 1) Facilities

Ben Lee
Process Engineer
Facility summary

Inter Pipeline Polaris operational

• New diluent pipeline for shipments to both Foster Creek (FC) and Christina Lake (CL)
• Began accepting deliveries at CL in October
• More stable supply and quality
• Will eventually support the entire facility in five years

Phase A/B turnaround completed

• Took place from May 3 to May 19 including ramp down/up
• Focus on OTSGs, Process area, and Flare Header
• Managed to offload emulsion into CDE facility to reduce impact to production
  ➢ Only lost ~25,000 bbls due to TA
Detailed plot plan – Phase C/D/E
Detailed plot plan – Phase A/B and C/D/E water treatment
Process schematic – Phase C/D/E
Process schematic – Phase C/D/E
Facility modifications

No major modifications made to Phase A/B/C/D/E

- Blowdown boiler addition expected in 2015
- CL1F expansion expected in 2016
Subsection 3.1.2 – 2) Facility performance

Ben Lee
Process Engineer
Plant performance

Exceeded design performance:

• Steam plant has achieved higher rates than nameplate design 
  (106%, 42,000 t/d vs nameplate 39,523 t/d)
• Water treatment (de-oiling) has achieved higher rates than nameplate design through each individual train 
  (104%, 51,032 t/d vs nameplate 49,146 t/d)
• Oil treating has achieved higher rates than nameplate design 
  (115%, 159,540 bbls/d vs 138,800 bbls/d)

Issues:

• Emulsion chemical treating program required optimization
Plant performance

Treating success

• Slop generation was one of major plant concerns in previous years, compounded by increased production
• Changes to chemical injection program in March 2014 improved oil treating performance while significantly reducing slop generated
• Slop handling is now completely internalized within the facility, with little to no offsite management
Bitumen treatment

Process

- Capacity of 138,800 bbls/d
- Have consistently achieved rates of 138,800 bopd (high of 159,540 bbls or 115% of design achieved)
- Have reduced issues with treating and water quality due to:
  - Optimized chemical treating
  - Improving operating procedures
  - Modifications to control logic
- Completed trial to examine maximum throughput capabilities of CDE process trains and determine what are constraints
- Implemented new diluent injection logic to more accurately control density throughout process trains
Water treatment

De-oiling

• Capacity of 49,146 t/d of water
• Flowed up to 51,032 t/d of water
• Issues in de-oiling are:
  • Water cooling at high flow rates
  • Fouling of heat exchangers
  • Deoiling efficiency at higher throughputs

Water treatment

• Blowdown recycle into the produced water treatment trains and BFW tank with no adverse impacts up to 54% of total blowdown volumes produced
• No major issues to report
Steam generation via 15 OTSGs

- Design capacity of 39,523 m³/d CWE dry steam
- Have achieved rates in excess of 42,000 m³/d CWE dry steam
- Typical operation: 82% quality
  - Tested operation of four OTSGs at 85% quality while maintaining blowdown recycle
  - Observed accelerated fouling rate compared to baseline OTSGs operating at 82%
  - Rigorous monitoring program including NDT, DT, and continuous boiler performance monitoring in place
Power usage

*Note – Plot represents monthly power imports. No operating power generation facilities at Christina Lake

© 2015 Cenovus Energy Inc.
Subsection 3.1.2-2d)
June 25, 2015
Gas usage

Diagram showing the average gas volume (m³/d) for various months from January 2014 to May 2015. The graph has four categories: Total Used Gas, Purchased, Produced, and Flared. The y-axis represents the volume in cubic meters per day, ranging from 0 to 3,000 m³/d.

Subsection 3.1.2-2e) June 25, 2015
Gas flared

Average Gas Volume (sE3m3/d)
Greenhouse gas emissions

Greenhouse gas emissions are reported to AER on yearly basis for review

• Q1 2015 total total direct emissions by gas type
  • CO₂ – 458,443 tonnes CO₂e
  • CH₄ – 450 tonnes CO₂e
  • N₂O – 727 tonnes CO₂e

• 2014 total direct emissions by gas type
  • CO₂ – 1,824,438 tonnes CO₂e
  • CH₄ – 3,805 tonnes CO₂e
  • N₂O – 2,903 tonnes CO₂e

*Note – Only the 2014 GHGs have been verified and submitted, the 2015 numbers are still preliminary.
Subsection 3.1.2 – 3) Measurement and reporting (MARP)

Colin Read
Production Engineer
Water imbalance exceedance

• Correction factors were applied to disposal volumes reported by the MARP meters as a result of inconsistencies between installed orifice plates, data sheets, and DCS calibration factors for the months of January to November, 2014.

• A letter of self disclosure for the water imbalance was submitted to AER on February 13, 2015.

2014 MARP SIRs addressed:

• 2014 SIRS addressed. Majority of SIRs and responses addressed metering discrepancies between the MARP document and schematic.

• Future phase meters clearly labeled for 2015 submission

• Updated tank lists and process schematics to reflect current information
Simplified MARP schematic

- Fresh Source from Wells
- Saline Source from Wells
- SAGD Production
- Utility to BT
- PW to IF
- Lease fuel to IF
- Lease Fuel
- PW & Waste to Disp.
- Blow Down to Disp.
- Domestic use
- Steam to Field

- Gas
- Oil
- Water

© 2015 Cenovus Energy Inc.
Subsection 3.1.2-3)
June 25, 2015
Injection volumes

Steam injection

• Steam to wells measured by nozzles or V-cone (>95% quality)

• Prorate well steam to plant steam (metered by flow nozzle off steam seps, checked by BFW- BD)
Production and injection volumes

Measured plant bitumen

- Blend (API 12.3) and bitumen inventory and trucking
- Incorporated diluent loss/bitumen gain into production calculation
- Estimate by well tests (2 phase test separators with BSW%)
  - 8-12 wells per separator (maximum 12 wells per separator)
  - ~10 hour cycles + purges
  - 1 hour of testing for every 20 hours of well operations, or about 4 x 10 hour tests per month

Gas production

- Plant measurement by balance
- Measuring well GOR based off well test and prorate to plant measurement
- Co-injected gas monitored and reported on a well basis
Proration factors

Overall water balance closure monitored on a monthly basis (< 5%)

Oil proration
• Typically 10%
• Some months have higher proration error due to facility turnaround, process upsets, BSW meter drift, and phase ramp up

Water proration
• Typically < 10%
• Some months have higher proration error due to facility turnaround, process upsets

Gas proration
• Variable and sometimes greater than 50%
• Variable due to:
  • Proration based from individual well tests (not facility GOR)

Steam proration
• Typically < 8%
• Some higher proration error occurred after start-up/commissioning and during plant upsets

© 2015 Cenovus Energy Inc.
Subsections 3.1.2-3b)
June 25, 2015
Proration factors

![Bar chart showing oil proration factors for different months and years, with specific values for January 2015 and February 2015 highlighted.]
Proration factors

Water Proration Factor

- Jan 2014
- Feb 2014
- Mar 2014
- Apr 2014
- May 2014
- Jun 2014
- Jul 2014
- Aug 2014
- Sep 2014
- Oct 2014
- Nov 2014
- Dec 2014
- 2014 YTD AVG
- Jan 2015
- Feb 2015
- Mar 2015
- 2015 YTD AVG

© 2015 Cenovus Energy Inc.
Subsections 3.1.2-3b)
June 25, 2015
Proration factors

Gas Proration Factor

- Jan-2014
- Feb-2014
- Mar-2014
- Apr-2014
- May-2014
- Jun-2014
- Jul-2014
- Aug-2014
- Sep-2014
- Oct-2014
- Nov-2014
- Dec-2014
- 2014 YTD AVG
- Jan-2015
- Feb-2015
- Mar-2015
- 2015 YTD AVG

Gas Proration Factor

© 2015 Cenovus Energy Inc.
Subsections 3.1.2-3b)
June 25, 2015
Proration factors

Steam Proration Factor

<table>
<thead>
<tr>
<th>Month</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Feb-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Mar-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Apr-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>May-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Jun-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Jul-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Aug-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Sep-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Oct-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Nov-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>Dec-2014</td>
<td>1.00</td>
</tr>
<tr>
<td>2014 YTD AVG</td>
<td>1.00</td>
</tr>
<tr>
<td>Jan-2015</td>
<td>1.06</td>
</tr>
<tr>
<td>Feb-2015</td>
<td>1.07</td>
</tr>
<tr>
<td>Mar-2015</td>
<td>1.00</td>
</tr>
<tr>
<td>2015 YTD AVG</td>
<td>1.00</td>
</tr>
</tbody>
</table>
MARP – New measurement technology

Cenovus continually focuses on evaluating new meter technologies

Water cut meters:

• Completed initial investigation and presented first results of water cut analysis by Delta C capacitance probe in the field. Further testing in store
• Investigating Weatherford’s Red Eye as alternative to AGAR Corporation
• Investigating water cut via density differential by coriolis meter using known density curves at T & P for water and bitumen
Subsection 3.1.2 – 4) Water production (injection and uses)

Ben Lee
Process Engineer
Fresh and brackish sources:

**Fresh wells:**
- Two Quaternary wells (Empress Formation) at 09-17-076-06W4M
- ESRD - Licensed for up to 5,000 m³/day
- TDS = 500-600 mg/L

**Brackish water source wells:**

- **Historical**
  - 10-34A 1F1/13-35-075-06W4/00 TDS= 7,400 mg/L
  - 10-34B 1F1/13-34-075-06W4/00 TDS= 7,200 mg/L
  - 10-34C 1F1/15-27-075-06W4/00 TDS= 7,200 mg/L
  - 10-3A 1F1/16-03-076-06W4/00 TDS= 4,600 mg/L
  - 10-3B 1F1/02-03-076-06W4/00 TDS= 5,700 mg/L
  - 10-27A 100/04-35-075-06W4/00 TDS= 11,600 mg/L
  - 10-27B 100/13-27-075-06W4/00 TDS= 8,700 mg/L
  - 10-27C 100/02-27-075-06W4/00 TDS= 12,100 mg/L

- **Disposal reversal well**
  - 3-16 1F5/03-16-076-06W4/00 TDS= 2,300 mg/L

- **2013**
  - CW4-A 1F1/01-35-075-06W4 TDS= 13,400 mg/L
  - CW4-B 1F1/06-01-076-06W4 TDS= 9,400 mg/L

- **New in 2014 (MW 1 wells-not used until Phase F startup)**
  - 1F1/07-18-076-05W4 Not sampled yet-expected TDS=>12,000mg/L
  - 1F1/09-07-076-05W4 Not sampled yet-expected TDS=>12,000mg/L
  - 1F1/03-07-076-05W4 Not sampled yet-expected TDS=>12,000mg/L
**Fresh water use**

**Uses:**
- Includes camp and domestic use, utilities, seal flushes, etc. All attempts are made to minimize fresh water usage.
- Was used for make-up water for steam during commissioning and start up
Fresh water intensity

![Graph showing fresh water intensity over time]
Brackish water use

Uses:
- Make-up water for steam generation
- Softened water used for slurry make-up, seal flushes etc.
Brackish water intensity

Uses:
- Make-up water for steam generation
- Softened water used for slurry make-up, seal flushes etc.
# Produced water volumes

<table>
<thead>
<tr>
<th>Year/Season</th>
<th>Average Monthly Rate (m³/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-2014</td>
<td>40,214</td>
</tr>
<tr>
<td>Feb-2014</td>
<td>42,115</td>
</tr>
<tr>
<td>Mar-2014</td>
<td></td>
</tr>
<tr>
<td>Apr-2014</td>
<td></td>
</tr>
<tr>
<td>May-2014</td>
<td></td>
</tr>
<tr>
<td>Jun-2014</td>
<td></td>
</tr>
<tr>
<td>Jul-2014</td>
<td></td>
</tr>
<tr>
<td>Aug-2014</td>
<td></td>
</tr>
<tr>
<td>Sep-2014</td>
<td></td>
</tr>
<tr>
<td>Oct-2014</td>
<td></td>
</tr>
<tr>
<td>Nov-2014</td>
<td></td>
</tr>
<tr>
<td>Dec-2014</td>
<td></td>
</tr>
<tr>
<td>2014 YTD AVG</td>
<td>40,214</td>
</tr>
<tr>
<td>Jan-2015</td>
<td></td>
</tr>
<tr>
<td>Feb-2015</td>
<td></td>
</tr>
<tr>
<td>Mar-2015</td>
<td></td>
</tr>
<tr>
<td>2015 YTD AVG</td>
<td></td>
</tr>
</tbody>
</table>

3-16 well reversal

Reversal of the 3-16 Disposal Well (RMR Slide)

444,920 m³ produced of the 5,236,500 m³ originally disposed

© 2015 Cenovus Energy Inc.
June 25, 2015
Steam volumes

Average Monthly Rate (m³/d)

© 2015 Cenovus Energy Inc.
Subsection 3.1.2-4d)
June 25, 2015
Water recycle ratio

Average Monthly Recycle Rate (%)
Directive 081 disposal limit
Produced water to steam ratio

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.05</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
<td>1.05</td>
<td>1.04</td>
<td>1.04</td>
<td>1.04</td>
</tr>
</tbody>
</table>
Blowdown recycle

NOTE: BD Recycle volumes very dependent of PW: Steam ratio
Water disposal operations

Continue to inject into McMurray water sands at 15-35
Approval No. 9712 and 10627 (Class 1b Disposal)

Nine disposal wells (all Class 1b)

• Three disposal wells located near the facility (3-16-1, 4-16, and 7-16 – now abandoned);
• One well located near the facility (3-16-2) has been converted for disposal reversal
• Six disposal wells in service located at 15-35

15-35 disposal is main disposal location with local wells used as back-up
McMurray water disposal wells

Existing Water Disposal
100/04-16-76-6W4
100/03-16-76-6W4
Converted to water prod well
1F5/03-16-76-6W4

Existing Water Disposal Wells
102/15-35-76-4W4
103/15-35-76-4W4
104/15-35-76-4W4
105/15-35-76-4W4
106/15-35-76-4W4
107/15-35-76-4W4

Upcoming Disposal Wells
105/13-34-76-3W4
102/15-35-76-4W4
103/15-35-76-4W4
104/15-35-76-4W4
105/15-35-76-4W4
106/15-35-76-4W4
107/15-35-76-4W4

*All disposal streams always attempted to be minimized
*Disposal temperatures at remote locations is less than 55 °C.
*Disposal temperature at plant site is higher as there is less pipeline cooling
Total disposal volumes (PW, RW, BD)

Notes: All disposal stream always attempted to be minimized. Specifically, blowdown recycle, regeneration optimization, and minimizing brackish makeup requirements to ensure the maximum amount of produced water can be used.
Disposal well head pressures

Remote disposal temperature < 55 °C
Local disposal temperature slightly higher due to lack of pipeline cooling

Disposal WH Limit = 5000 kPag

Disposal injection volume
Water disposal operations
Water disposal operations cont’d

![Graph showing pressure changes over time](image)

- **100/08-34-076-06W4**

- **Pressure (kPa)**

- **Time Period:**
  - Nov-12 to Apr-15

- **Key Observations:**
  - Sharp increases in pressure in May and Jun 2013
  - Steady pressure levels from Nov 2012 to May 2013

© 2015 Cenovus Energy Inc.
Subsection 3.1.2.-4h
June 25, 2015
Waste disposal volumes

Reduced slop oil volume due to treating improvements with chemical optimization.

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2013</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slop Oil / Production Fluids (m³)</td>
<td>82,241</td>
<td>157,155</td>
<td>74,262</td>
</tr>
<tr>
<td>Drilling Waste (m³)</td>
<td>56,260</td>
<td>37,086</td>
<td>27,796</td>
</tr>
<tr>
<td>Lime Sludge (m³)</td>
<td>15,279</td>
<td>23,759</td>
<td>10,437</td>
</tr>
<tr>
<td>Contaminated Soils (m³)</td>
<td>187</td>
<td>310</td>
<td>1,511</td>
</tr>
<tr>
<td>Spent Scavenger (m³)</td>
<td>5,346</td>
<td>2,975</td>
<td>1,932</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>159,313</td>
<td>221,285</td>
<td>115,938</td>
</tr>
</tbody>
</table>
## Waste disposal sites 2014

<table>
<thead>
<tr>
<th>Facility</th>
<th>Total (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Env. Class Ia Disposal Well</td>
<td>1,063</td>
</tr>
<tr>
<td>Cancen New Sarepta Disposal Well</td>
<td>4,417</td>
</tr>
<tr>
<td>Newalta Elk Point</td>
<td>31,861</td>
</tr>
<tr>
<td>Newalta Hughendon</td>
<td>729</td>
</tr>
<tr>
<td>R.B.W. Edmonton</td>
<td>999</td>
</tr>
<tr>
<td>Tervita Bonnyville Landfill</td>
<td>986</td>
</tr>
<tr>
<td>Tervita Janvier Landfill</td>
<td>59,445</td>
</tr>
<tr>
<td>Tervita Lindbergh Cavern</td>
<td>67,350</td>
</tr>
<tr>
<td>Tervita Mitsue</td>
<td>274</td>
</tr>
<tr>
<td>Tervita Unity, SK Cavern</td>
<td>311</td>
</tr>
<tr>
<td><strong>TOTAL (m³)</strong></td>
<td><strong>167,434</strong></td>
</tr>
</tbody>
</table>

Cenovus Christina Lake trucks all disposal waste to licensed third party facilities
Subsection 3.1.2 – 5) Sulphur production

Ben Lee
Process Engineer
Scavenger recovery details

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2014</td>
<td>71.8%</td>
</tr>
<tr>
<td>Q2 2014</td>
<td>71.2%</td>
</tr>
<tr>
<td>Q3 2014</td>
<td>71.4%</td>
</tr>
<tr>
<td>Q4 2014</td>
<td>70.4%</td>
</tr>
<tr>
<td>Q1 2015</td>
<td>73.8%</td>
</tr>
</tbody>
</table>
Scavenger uptime details

Both trains offline to replace trim in valve that had been plugging

One train taken offline for cleaning
One train taken offline for cleaning
One train taken offline for cleaning
Sulphur recovery operation

Preventative measures

- Chemical injection continues to be operated in counter current configuration
- Each train is on a 6-12 month PM to be cleaned (contactor, internal distributor, outlet separator demister inspected)
- Cleaning frequency determined based on process monitoring (pressure drop, spent chemical quality, gas temperature)
SO\textsubscript{2} emissions

![Graph showing SO\textsubscript{2} emissions over time]

- Actual Daily SO\textsubscript{2} t/d
- Quarterly Average SO\textsubscript{2} t/d
- AENV EPEA Approval Limit t/d

© 2015 Cenovus Energy Inc.
Subsection 3.1.2-5c)
June 25, 2015
Ambient air quality monitoring

Passive exposure monitoring

As per the Approval (Table 3.3), prior to commencing operation of Phase E, Christina Lake was required to maintain a network of four passive monitoring exposure stations to obtain monthly static exposures of H2S and SO2. After Phase E commenced operation, i.e., in June 2013, 12 passive monitoring exposure stations must be maintained.

Passive exposure monitoring was conducted for SO2 and H2S at the AESRD approved passive monitoring locations from January through December, 2014.

The passive monitoring results in 2014 did not identify any significant air quality issues related to Plant operations.

Continuous air quality monitoring

CLSF is required in the Approval (Table 3.3) to maintain one continuous ambient air monitoring station 12 months per year to measure ambient levels of SO2, H2S, and NO2 concentrations in addition to wind speed and wind direction.

In 2014, continuous air quality monitoring was conducted from Jan 1 to December 31 by Maxxam Analytics. The continuous ambient air monitoring station is located approximately at 03-16-076-06-W4M. This location is the same as the passive monitoring station C10. Parameters measured were SO2, H2S, NO2, wind speed and direction.

There were no operational issues relating to the ambient air monitoring equipment during the monitoring period.

The continuous ambient air quality monitoring in 2014 did not identify any significant air quality issues related to Plant operations.

No criteria exceedances were noted in either monitoring program
### Ambient monitoring trailer for 2014 monthly summary results

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Maximum Reading for 2014 (ppbv)</th>
<th>Date of Maximum Reading in 2014</th>
<th>Limit (ppbv)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SO&lt;sub&gt;2&lt;/sub&gt;</td>
<td>20</td>
<td>June 30</td>
<td>172</td>
</tr>
<tr>
<td>1 hr average</td>
<td>3.3</td>
<td>Jan. 15, Oct. 2</td>
<td>48</td>
</tr>
<tr>
<td>24 hr average</td>
<td>1.4</td>
<td>Dec. 11</td>
<td>3</td>
</tr>
<tr>
<td>H&lt;sub&gt;2&lt;/sub&gt;S</td>
<td>3</td>
<td>Oct. 22, Dec. 11</td>
<td>10</td>
</tr>
<tr>
<td>NO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>58</td>
<td>Dec. 3</td>
<td>159</td>
</tr>
</tbody>
</table>

- As was noted for the period 2010 to 2013, in 2014, there were no ambient NO<sub>x</sub>, SO<sub>2</sub> or H<sub>2</sub>S readings above the Alberta Ambient Air Quality Objective (AAAQO).
- Maximum 1 hour and 24 hour average values for SO<sub>2</sub>, H<sub>2</sub>S, and NO<sub>x</sub> for 2014 are listed above.
Subsection 3.1.2 – 7) Environmental issues

Michelle Camilleri
Sr. Environmental Advisor
# 2014 Compliance issues and amendments

<table>
<thead>
<tr>
<th>Approval number</th>
<th>Amendments</th>
<th>Compliance issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPEA Approval 00048522-00-05</td>
<td>“Plant” definition amended to include TWP 75</td>
<td>No</td>
</tr>
<tr>
<td>EPEA Approval 00298224-00-00</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Water Act Approval 00265924-00-01</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Water Act License 00267617-00-02</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Water Act License 00285141-00-01</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Water Act License 00082524-00-06</td>
<td>Amended to include additional water source uses</td>
<td>No</td>
</tr>
<tr>
<td>Water Act License 00343057-00-00</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Water Act License 00293633-00-00</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
## Monitoring programs

<table>
<thead>
<tr>
<th>Monitoring program</th>
<th>Progress and results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality monitoring</td>
<td>Air emissions increased in 2014. This was a direct result of Phase E operating at full capacity for the full calendar year.</td>
</tr>
<tr>
<td>Groundwater monitoring</td>
<td>No material changes in 2014</td>
</tr>
<tr>
<td>Thermal metal mobilization monitoring</td>
<td>Well chemistry showed the influence of cement infiltration, wells were cleaned out Q3 2014. No chemical or temperature impacts related to thermal effects were detected in 2014.</td>
</tr>
<tr>
<td>Soil monitoring program</td>
<td>Soil Monitoring Program Proposal authorized April 23, 2014 and second monitoring event completed.</td>
</tr>
<tr>
<td>Wildlife and caribou mitigation and monitoring programs</td>
<td>AGP Monitoring, Winter Track and Remote Cameras, Amphibian and Breeding Bird Community Response to Development monitoring completed in 2014.</td>
</tr>
<tr>
<td></td>
<td>Three Year comprehensive report due May 15th, 2015.</td>
</tr>
<tr>
<td>Wetland monitoring program</td>
<td>No material changes in 2014</td>
</tr>
</tbody>
</table>
## Monitoring programs continued

<table>
<thead>
<tr>
<th>Monitoring program</th>
<th>Progress and results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reclamation monitoring program</td>
<td>Deferred until December 31, 2016. No permanent reclamation has occurred to date, however Cenovus continues to evaluate opportunities for permanent reclamation at the Project, including well pads.</td>
</tr>
<tr>
<td>Wetland reclamation trial program</td>
<td>Deferred until a candidate site becomes available</td>
</tr>
<tr>
<td>Project level conservation, reclamation and closure plan</td>
<td>Deferred until December 31, 2016</td>
</tr>
</tbody>
</table>
Environmental initiatives

The regional multi-stakeholder forums that Cenovus was involved with in 2014 include:

• Cumulative Effects Management Association (CEMA) Land Working Group

• Canadian Oil Sands Innovation Alliance (COSIA): Linear Deactivation Program (LiDEA)

• Joint Canada-Alberta Oil Sands Monitoring (JOSM)
  • Wood Buffalo Environmental Association (WBEA)
  • Alberta Biodiversity Monitoring Institute (ABMI)
  • Regional Aquatics Monitoring Program (RAMP)

• Industrial Footprint Reduction Options Group (iFROG)
Subsection 3.1.2 – 8)
Statement of compliance

Chris Grant
Specialist
(Regulatory Audit & Compliance)
2014 Compliance status

Maintain and track compliance

• Incident Management System (IMS)
• Centrac Database for commitment management
• Internal Regulatory Compliance Audit Team
• Dedicated onsite Environmental Monitoring and Stewardship Advisors
• Routine inspections and audits
• Raise awareness through training
• Establish consistent management processes

Cenovus FCCL Ltd. believes existing CLTP operations are in compliance with AER approvals and regulatory requirements.
Subsection 3.1.2 – 9)
Statement of non-compliance

Chris Grant
Specialist
(Regulatory audit & compliance)
## 2014 Non-compliances – AER/AESRD

<table>
<thead>
<tr>
<th>Date</th>
<th>Non compliance/self-disclosure</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-04-03</td>
<td>Notice of Low Risk Noncompliance - Commencement of Drilling without Notice @ 10/4-2-76-6W4 W0461895</td>
<td>Compliance achieved on May 1, 2014</td>
</tr>
<tr>
<td>2014-04-01</td>
<td>Unsatisfactory Low Risk Drilling Operations @ 9-11-76-6W4 - Notification of Commencement of Drilling (Spud) - Cenovus FCCL did not notify the appropriate Field Center within 12 hours of the commencement of the drilling of a well.</td>
<td>Compliance achieved on April 11, 2014</td>
</tr>
<tr>
<td>2014-03-15</td>
<td>Drilling Mud Releases to Surface during Utility Corridor Directional Drilling Project (SE-17-076-06W4M)</td>
<td>Clean-up complete</td>
</tr>
<tr>
<td>2014-01-10</td>
<td>Unsatisfactory Low Risk Drilling Operations @ 9-3-76-6W4 - At the time of the inspection, the shop certifications for the spool in use were not pressure tested in accordance with Appendix 5 of Directive 36.</td>
<td>Compliance achieved on February 3, 2014</td>
</tr>
<tr>
<td>2014-01-10</td>
<td>2.5m³ spill of floc water (01-11-076-06W4)</td>
<td>Clean-up Complete</td>
</tr>
<tr>
<td>2014-01-08</td>
<td>Trespass of the 1AA/12-13-76-5W4 well whereby the well was drilled 1.1m beyond the allowable 15m overhole.</td>
<td>Compliance achieved on 30-Jan-2014</td>
</tr>
<tr>
<td>2014-01-07</td>
<td>Release of 3m³ of strip water at strip water site (NE-06-076-06-W4M)</td>
<td>Clean-up Complete</td>
</tr>
</tbody>
</table>
### 2014 Non-compliances – AER/AESRD

#### Con’t

<table>
<thead>
<tr>
<th>Date</th>
<th>Non-compliance/self-disclosure</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-12-22</td>
<td>Site entry to conduct hill cut without AER Approval (2-25-76-6W4)</td>
<td>Compliance achieved</td>
</tr>
<tr>
<td>2014-11-13</td>
<td>5.3 m³ of Propylene Glycol Spill</td>
<td>Clean-up complete</td>
</tr>
<tr>
<td>2014-11-08</td>
<td>1.5m³ of clay material placed off disposition (07-17-076-06 W4M)</td>
<td>Clean-up complete</td>
</tr>
<tr>
<td>2014-09-11</td>
<td>Packer Testing @ 102/7-16-76-6W4 W0249293 - Failure to complete necessary reporting of required packer testing by September 1 of each year</td>
<td>Compliance achieved on December 11, 2014</td>
</tr>
<tr>
<td>2014-07-03</td>
<td>Trespass @ 6-2-76-6W4 0450645</td>
<td>Compliance achieved on December 23, 2014</td>
</tr>
<tr>
<td>2014-06-8</td>
<td>Fresh water release from hydrotest of pipeline</td>
<td>Clean-Up complete</td>
</tr>
<tr>
<td>2014-04-27</td>
<td>Sedimentation released off disposition (06-15-076-06W4M)</td>
<td>Clean-up complete</td>
</tr>
<tr>
<td>2014-04-06</td>
<td>Surface water and sedimentation released off disposition (SE-14-076-06W4M)</td>
<td>Clean-up complete</td>
</tr>
</tbody>
</table>
Subsection 3.1.2 – 9) Future plans
## Major activities and target dates

<table>
<thead>
<tr>
<th>Phase</th>
<th>Regulatory</th>
<th>Production capacity (bbl/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Filing</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>Q1 1998</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Q2 2005</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Q3 2007</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>Q3 2007</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>Q3 2009</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>Q3 2009</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>Q3 2009</td>
</tr>
<tr>
<td>FG Amendment</td>
<td></td>
<td>Q4 2012</td>
</tr>
<tr>
<td>CDE 2nd Stage OTSG</td>
<td></td>
<td>Q4 2012</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>Q1 2013</td>
</tr>
</tbody>
</table>
## Filed applications

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Date filed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Phase H and eastern expansion</td>
<td>March, 2013</td>
</tr>
<tr>
<td>1</td>
<td>Emulsion circulation during unscheduled plant shutdown</td>
<td>April, 2014</td>
</tr>
<tr>
<td>2</td>
<td>B01/B02 rampdown/blowdown pilot</td>
<td>April, 2014</td>
</tr>
<tr>
<td>1</td>
<td>Phase D aerial cooler equipment change</td>
<td>June, 2014</td>
</tr>
<tr>
<td>2</td>
<td>Casing gas re-injection B03-7</td>
<td>March, 2014</td>
</tr>
<tr>
<td>2</td>
<td>Air co-injection trial B05-8</td>
<td>July, 2014</td>
</tr>
<tr>
<td>2</td>
<td>L pad trajectory amendment</td>
<td>June, 2014</td>
</tr>
<tr>
<td>2</td>
<td>Producer well length extension (B10-1 to B10-5)</td>
<td>May, 2014</td>
</tr>
<tr>
<td>2</td>
<td>A01 permanent blowdown</td>
<td>August, 2014</td>
</tr>
<tr>
<td>2</td>
<td>A02-2 SAP methane injection to demonstrate butane recovery</td>
<td>August, 2014</td>
</tr>
<tr>
<td>2</td>
<td>B13 well length extension</td>
<td>December, 2014</td>
</tr>
</tbody>
</table>
# Filed applications

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Date filed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phase CDE oil debottleneck</td>
<td>Feb, 2015</td>
</tr>
<tr>
<td>1</td>
<td>Multi directional wells SAGD enhanced lengths</td>
<td>March, 2015</td>
</tr>
<tr>
<td>2</td>
<td>Non-condensable gas ventilation well (B08 or H01)</td>
<td>March, 2015</td>
</tr>
<tr>
<td>2</td>
<td>L09, J07, L07 well length extension</td>
<td>March, 2015</td>
</tr>
</tbody>
</table>
## Potential future applications

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Planned filing date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Sustaining pad trajectory amendment</td>
<td>Q3 2015</td>
</tr>
<tr>
<td>2</td>
<td>B03/B04 methane co-injection</td>
<td>Q3 2015</td>
</tr>
<tr>
<td>3</td>
<td>Development area expansion</td>
<td>Q4 2015</td>
</tr>
</tbody>
</table>
Changes to plant design or water treatment strategy

Current plans are consistent with existing approvals

Any future changes will be communicated via notifications or amendments as required

Phases F and G amendment incorporates “cogeneration” into the CLTP

• Power generated will supply onsite operations

The following applications will have the potential to improve CLTP current water metrics

• CDE 2nd Stage OTSGs project
• Phase H project application