



May 9, 2017

3425-2800-32640-02

Kristopher Kruse, P.Eng.  
Senior Operations Production Engineer  
ARC Resources Ltd.  
1200, 308 4<sup>th</sup> Avenue, SW  
Calgary, Alberta T2P 0H7

Dear Mr Kruse,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL  
ARCRES DOE 7-1-80-15; WA# 24350  
DOE FIELD – CADOMIN FORMATION**

The Commission has received ARC's application, dated March 22, 2017, for produced water disposal into the subject well, Cadomin formation. The well was drilled down to Montney depth and rig released on November 21, 2008. The Montney produced 3,110 e3m3 of gas between 2009 and 2013. In December 2016 the Montney was abandoned with a bridge plug and cement. The Cadomin was completed for disposal purpose in January 2017.

Attached please find **Order 17-02-007**, designating an area in the Doe field – Cadomin formation as a Special Project under section 75 of the *Oil and Gas Activities Act*, for the operation and use of a storage reservoir for the disposal of produced water. This Order contains a number of detailed operational conditions, including a maximum wellhead injection pressure, requirement for continuous tubing and casing pressure monitoring, and an ultimate reservoir pressure limit. Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.


For the inspection requirement of Order condition 2i), please arrange via email to [OGCPipelines.Facilities@bcogc.ca](mailto:OGCPipelines.Facilities@bcogc.ca).

In certain circumstances, disposal well operation may induce seismicity of values that require modification of operations to mitigate. The accelerometer in place on ARC's nearby acid gas disposal well WA 30922 may be one tool used to monitor ground motion in the area.

Please note that disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure, as per order condition 2(b).

Should you have any questions, please contact Michelle Harding at (250) 419-4493 or Ron Stefik at (250) 419-4430.

Sincerely,




Richard Stocomb, P.Eng  
Vice President, Engineering  
Oil and Gas Commission

Attachment

ORDER 17-02-007

- 1 Under Section 75(1)(d) of the *Oil and Gas Activities Act*, the Commission designates the operation and use of a storage reservoir for the disposal of produced water, including flowback from fracturing operations, into the Cadomin formation – Doe field as a special project in the following area:  
DLS Twp 80 Rge 15 W6M Section 1 - Lsds 1, 2, 7 and 8
- 2 Under section 75(2) of the *Oil and Gas Activities Act*, the special project designation in this Order is subject to the following conditions. The Permit Holder shall:
  - a) Inject produced water only into the well Arcres Doe 7-1-80-15; WA# 24350 – Cadomin formation (disposal perforations 1387.0 – 1424.0 mKB).
  - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 18,030 kPag or the pressure required to fracture the formation, whichever is lesser.
  - c) Inject only through tubing with a packer set as near as is practical above the injection interval.
  - d) Continually measure and record the wellhead casing and tubing pressures electronically.
  - e) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
  - f) Submit the annual packer isolation test report to the Commission within 30 days of the completion of the test.
  - g) Include the disposal operating hours and the maximum injection pressure value on the monthly BC-S18 disposal statement.
  - h) Conduct an annual reservoir pressure test on the formation in the subject well, with a shut-in period of sufficient length to provide data for calculation of the reservoir pressure, and submit a report of the test within 60 days of the end of the test.
  - i) Cease injection upon reaching a maximum formation pressure of 14,750 kPaa, measured at 1405.5 mKB.
  - j)
    - i) Perform a casing inspection log on the subject well and submit results to the Commission within 30 days of the completion of logging, at an interval of not more than every 10 years, commencing from the date of initial disposal.
    - ii) Perform a hydraulic isolation temperature log on the subject well and submit results to the Commission within 30 days of the completion of logging, at an interval of not more than every 5 years, commencing from the date of initial disposal.
  - k) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
  - l) Complete an inspection, satisfactory to the Commission, within 4 weeks of initial disposal operations.



Richard Slocomb, P.Eng  
Vice President, Engineering  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 9<sup>th</sup> day of May, 2017.

## Advisory Guidance for Order 17-02-007

- I. A production packer must be set above the injection interval and the space between the tubing and casing filled with corrosion and frost inhibiting fluids, as per section 16(2) of the Drilling and Production Regulation.
- II. Annual packer isolation tests are required to be submitted, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered and the injection pressure measured at the wellhead, as per section 74 of the Drilling and Production Regulation.
- IV. A monthly disposal statement must be submitted to the Commission not later than the 25<sup>th</sup> day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.
- V. Seismic events must be reported and disposal operations suspended as per section 21.1 of the Drilling and Production Regulation.