



March 7, 2019

8120-2100-32640-02

Jaryn Flower, P.Eng.  
Production Engineer  
ARC Resources Ltd.  
1200, 308 – 4<sup>th</sup> Avenue SW  
Calgary, AB T2P 0H7

Dear Jaryn Flower,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL  
ARCRES SUNRISE C13-30-78-17; WA# 30475  
SUNRISE FIELD – PADDY-CADOTTE FORMATION**

The Commission has reviewed the application submitted by Benoit Regulatory Compliance on behalf of ARC Resources, dated January 11<sup>th</sup>, 2019, for produced water disposal into the subject well, Paddy-Cadotte formation. The subject deviated well was drilled for disposal purposes in July 2018. Wellbore integrity testing and resource evaluation shows that the well is suitable for disposal purpose.

Attached please find **Order 19-02-004**, designating an area near the Sunrise field – in the Paddy-Cadotte 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 continuous wellhead measurements, a maximum wellhead injection pressure, and an ultimate reservoir pressure limit.

Disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure.

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

Should you have any questions, please contact Michelle Gaucher at (250) 419-4482 or the undersigned at (250) 419-4430.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ron Stefik".

Ron Stefik, Eng.L.  
Supervisor, Reservoir Engineering  
Oil and Gas Commission


Attachment

**ORDER 19-02-004**

- 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 Paddy-Cadotte formation – near the Sunrise field as a special project in the following area:

DLS Twp 78 Rge 17 W6M Section 30 - Lsds 11, 12, 13 and 14.

- 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 Sunrise C13-30-78-17; WA# 30475 – Paddy-Cadotte formation (974.0 – 989.0 mKB MD).
  - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 13,000 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) Include the disposal operating hours and the maximum injection pressure value on the monthly Petrinex disposal volume statement.
  - f) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
  - g) Submit the annual packer isolation test report to the Commission within 30 days of the completion of the test.
  - h) Conduct and submit an annual Surface Casing Vent Flow test to the Commission within 30 days of the completion of the test.
  - i) 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.
  - j) Cease injection upon reaching a maximum formation pressure of 6,700 kPaa, measured at MMP of 889.9 mKB TVD.
  - k) 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.
  - l) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
  - m) Complete an inspection, satisfactory to the Commission, within 4 weeks of initial disposal operations.



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Ron Stefik, Eng.L.  
Supervisor, Reservoir Engineering  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 7<sup>th</sup> day of March, 2019.

## Advisory Guidance for Order 19-02-004

- 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 via Petrinex not later than the 20<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.