

January 7, 2014

8157-2600-32640-02

Melanie Nadeau, P.Eng.
ARC Resources Ltd.
1200, 308 – 4th Ave SW
Calgary AB T2P 0H7

Dear Ms. Nadeau:

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT
ARCRES TOWER 4-12-81-17W6; WA# 18308
BLUESKY FORMATION**

Oil and Gas Commission staff have reviewed your request, dated January 3, 2014, to recommence disposal operations granted under Approval 09-02-005 (WA #18308). Deep disposal wells are a key component of oil and gas development and operations.

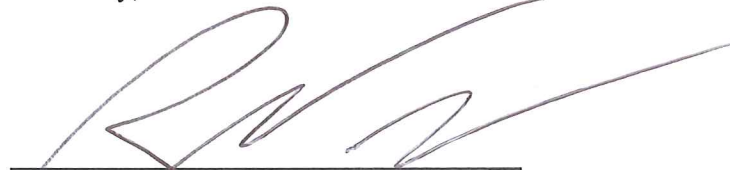
The subject well was originally drilled by Storm Exploration Inc., rig released November 14, 2004. The well was completed in the Doig, Halfway and Cadomin formations and produced 3,137 e3m3 of gas from the Doig formation from June 2005 to July 2006. Approval for produced water disposal into the Bluesky formation was granted June 6, 2007, with a limited volume disposed from November 2008 to April 2009. ARC Resources gained ownership of the well in 2010.

Attached find **Order 09-02-005 (Amendment #1)**, designating an area in the Tower field – Bluesky formation a Special Project under section 75 of the *Oil and Gas Activities Act (OGAA)*, for use of a storage reservoir for the disposal of produced water and well stimulation flowback fluid. This amended Order includes a number of detailed operational conditions, including: maximum wellhead injection pressure, ultimate reservoir pressure limit, wellbore integrity monitoring and reporting requirements. Additional general information regarding disposal wells is available on the Commission's website at <http://bcogc.ca/node/5997/download>.

This amendment to the original Order is effective January 20, 2014, to allow a period for any concerns to be communicated to this office. As discussed verbally, a reservoir pressure test of the Bluesky formation is required prior to recommence of disposal injection.

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

Sincerely,



Richard Slocumb, P.Eng.
Deputy Commissioner, Engineering
Oil and Gas Commission

Attachment

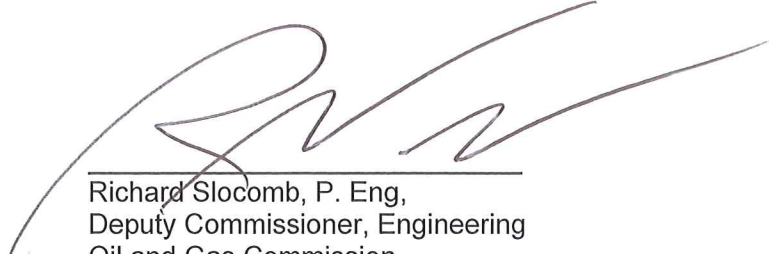
ORDER 09-02-005 (Amendment #1)

1. Under Section 75(1)(d) of the *Oil and Gas Activities Act*, the Oil and Gas Commission (Commission) designates the operation and use of a storage reservoir for the disposal of salt water and produced water, including flowback from fracturing operations, into the Bluesky formation – Tower field as a special project in the following area:

DLS Twp 81 Rge17 W6M Section 12 – Lsd 3, 4, 5 and 6.

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 salt water and produced water, including well flowback completion fluids, only into the well Arcres Tower 04-12-081-17 (Well Permit # 18308), Bluesky formation (1095.0 mKB to 1102.0 mKB).
- b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 11,500 kPag or the pressure required to fracture the formation, whichever is lesser.
- c) Inject only through tubing.
- d) Continually measure and record the wellhead casing and tubing pressures.
- 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 values on the monthly disposal statement.
- h) Cease injection upon reaching a maximum formation pressure of 120% of initial reservoir pressure.
- i) Conduct a reservoir pressure test on the Bluesky formation in the subject well prior to recommencement of disposal operations and submit a report of the test within 10 days of the end of the test to the Commission.
- j) Conduct an annual reservoir pressure test on the Bluesky 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.
- 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 original disposal.
 - ii) Perform a hydraulic isolation temperature log on the subject well if one has not been run in the last 5 years, within six months of the date of this Order and submit results to the Commission within 30 days of the completion of logging, and thereafter at an interval of not more than every 5 years, commencing from the date of recommencement of disposal.
- l) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.



Richard Slocomb, P. Eng,
Deputy Commissioner, Engineering
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 7th day of January, 2014.

Advisory Guidance for Order 09-02-005 (Amendment #1)

- I. A production packer must be set above the injection interval and the space between the tubing and casing filled with corrosion inhibiting fluids, as per section 16(2) of the Drilling and Production Regulation.
- II. Annual packer isolation tests are required, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered, 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 25th day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.