

April 11, 2014

800-4100-32640-02

Neil Rubeniuk  
ConocoPhillips Canada Operations Ltd.  
2100, 250 – 6th Ave. S.W.  
Calgary, AB  
T2P 5N2

Dear Mr. Rubeniuk:

**RE: PRODUCED WATER DISPOSAL WELL SPECIAL PROJECT (AMENDMENT #1)  
COPOL BEAU BEG d-25-G/94-G-1; WA# 13168  
BEG FIELD – BALDONNEL FORMATION**

Oil and Gas Commission staff have been made aware of the intention to recommence disposal operations at the subject well, granted disposal Approval 01-02-008 on July 30, 2001. The Commission is presently amending active disposal well approvals to conform to current requirements.

Attached please find Order 01-02-008 Amendment #1, designating an area in the Beg field – Baldonnel 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 and well stimulation flowback fluid. This Order includes a number of detailed operational conditions including: continuous wellhead measurements, a maximum wellhead injection pressure, ultimate reservoir pressure limit, as well as wellbore integrity monitoring and reporting requirements.

The subject well has been in semi-continuous disposal operation since August 2002, with a cumulative disposal volume of 82,952 m<sup>3</sup> as of January 2014. The last reported reservoir pressure test was in March 2001. The CBL is of fair quality over a large portion of the disposal zone. No reports regarding zonal isolation verification and wellbore integrity logging have been received since disposal operation commenced. A hydraulic isolation log will be used to determine zonal containment of the injected fluid. The attached Order contains current disposal well requirements, specifically:

- Current reservoir pressure, condition 2(i), is a periodic measurement (yearly) confirming continued disposal is viable, remaining below the maximum formation pressure limit, and providing information to potentially forecast remaining disposal life. For the purpose of this disposal condition, the reservoir pressure is the pressure measured at the perforated interval within 60 days of shut-in of the well (utilizing bottom-hole recorders). The well does not need to be shut-in 60 days, if the pressure drops to the reservoir pressure limit value (condition 2(h), 13,760 kPa) in a shorter time period, or if fall-off data is of a quality that pressure transient analysis can confidently be extrapolated to a 60-day shut-in value. The 60-day value provides assurance that the formation porosity and permeability allows fluid to dissipate without creation of a zone of excessive pressure at the injection location.
- Wellbore integrity verification, condition 2(j)(i), requires a full length casing inspection log capable of detecting anomalies, holes, pits, metal loss, wall thickness and internal and external corrosion and casing roundness. This is normally achieved with an electromagnetic phase shift tool (MTT) and caliper log from surface to plug back depth.

- Confirmation of zonal isolation of the injected fluids, condition 2(j)(ii), may be achieved with a temperature log.

The maximum wellhead injection pressure value is determined to be 9,300kPag.

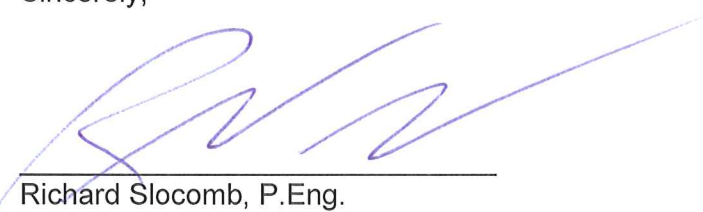
Monthly reporting requirements have been amended, specifically reporting of the maximum wellhead pressure value. Instructions are posted at <http://www.bcogc.ca/node/11152/download>.

Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.

Disposal wells are subject to regular field inspection and audit. Contravention of a condition of this Order may be subject to enforcement under Section 62 of OGAA, or suspension or cancellation of the Order under Section 75(2)(b).

Should you have any questions, please contact Petra Kriescher-Trudgeon at (250) 419-4415 or Ron Stefik at (250) 419-4430.

Sincerely,



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

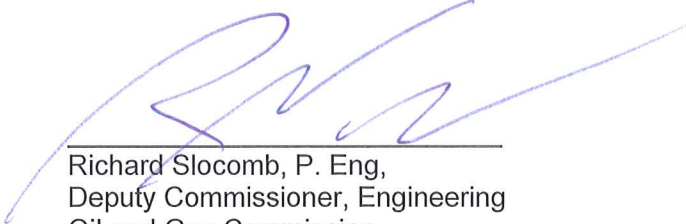
Attachment

**ORDER 01-02-008, 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 produced water, including flowback from fracturing operations, into the Baldonnel formation – Beg field as a special project in the following area:

NTS 94-G-01 Block G Unit 25

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, including well flowback completion fluids, only into the well Copol Beau Beg d-25-G/94-G-01; WA# 13168 Baldonnel formation.
  - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 9,300 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.
  - 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 13,760 kPaa.
  - i) Conduct a reservoir pressure test on the formation in the subject well, within 90 days of the date of this Order, 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, and annually thereafter.
  - j)
    - i) Perform a casing inspection log on the subject well, within 90 days 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 10 years.
    - ii) Perform a hydraulic isolation log on the subject well within 90 days 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.
  - k) 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 11<sup>th</sup> day of April 2014.

## Advisory Guidance for Order 01-02-008, Amendment #1

- I. A production packer must be set above the injection interval and the space between the tubing and casing (including the space between the 3 packers) 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 25<sup>th</sup> day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.