

January 13, 2014

7000-4800-59240-09

Travis Paradis, P. Eng.
Exploitation Engineer
Canadian Natural Resources Ltd.
2500, 855 – 2nd Street S.W.
CALGARY, AB T2P 4J8

Dear Mr. Paradis:

**RE: PRESSURE MAINTENANCE WATERFLOOD ORDER, AMENDMENT #2
OTHER THAN NORMAL SPACING ORDER, AMENDMENT #2
PEEJAY WEST – HALFWAY “C” POOL**

The Commission has reviewed your application dated, November 29, 2013, requesting an amendment to the pressure maintenance waterflood order previously granted for the Peejay West - Halfway “C” oil pool.

This amendment allows for conversion of the suspended well a-21-G/94-A-15 (WA 3953) into an injector, to improve pool oil recovery. This well was drilled in 1977 and completed in the Gething formation, but not produced. The Halfway “C” was completed in 1989, producing from 1992 until suspended in 1999. In 2001 the sliding sleeve was opened and Gething gas produced until March 2012. Due to the age and history of this well, this approval will be effective upon review of wellbore integrity logs that indicate acceptable service condition.


The following Orders are attached:

- 1) Order 04-09-003 (Amendment #2) designating Pressure Maintenance Waterflood, within the Peejay - Halfway “C” pool as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 04-09-003-OTN (Amendment #2) approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject formation and area.

Please note that, as per section 75 of the *Drilling and Production Regulation*, a record of the volume of water injected and maximum injection pressure must be included on a Monthly Injection or Disposal Statement (BC-S18), which must be submitted to the Commission no later than the 25th day of the month in which activity occurred. This Order contains new operating conditions including a maximum wellhead injection pressure and ultimate reservoir pressure limit. Also, as per item 3 of the Approval, annual progress reports must be submitted to the Commission. The project area remains unchanged.

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

Sincerely,



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

Attachments

IN THE MATTER of an application from Canadian Natural Resources Ltd. to the Commission dated November 29, 2013 for amending a Pressure Maintenance – Waterflood project.

ORDER 04-09-003 (AMENDMENT #2)

- 1 Under Section 75(1)(a) of the *Oil and Gas Activities Act*, the Peejay West – Halfway “C” pool is designated as a special project for pressure maintenance for recovery of oil by water injection within the following area;

94-A-15 Block G – Units 11, 21.
Block H – Units 10, 20 and 30.

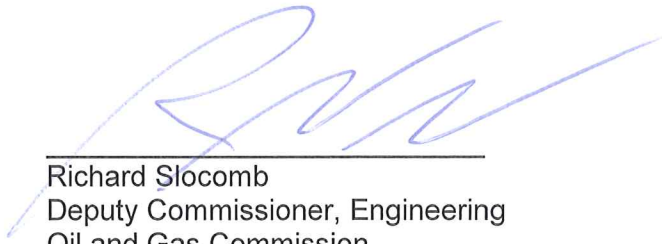
- 2 Under section 75(2) of the *Oil and Gas Activities Act*, I specify the following:

- a) The oil production allowable for a month shall be based on the previous month’s voidage replacement.
- b) All associated produced gas must be conserved.
- c) Water may be injected into the Peejay West - Halfway “C” pool through the wells:

Well Permit #	Well Name	Current Status
17532	CNRL W PEEJAY d- 010-H/094-A-15	Active
3953	CNRL W PEEJAY a- 021-G/094-A-15	Suspended Oil

- d) The wellhead injection pressure of wells noted in c) must be continually measured and recorded, and must not exceed **8,800 kPa**.
 - e) A monthly BC S18 injection statement including the injection operating hours and the maximum injection pressure values must be submitted before the 25th day of the month following the month of injection.
 - f) The maximum average formation pressure should not exceed **11,829 kPa, 120%** of the initial pool pressure of 9,866 kPa.
 - g) This approval will be effective upon review of wellbore integrity logs for CNRL W PEEJAY a-21-G/094-A-15 indicating acceptable service condition.
 - h) An annual packer isolation test must be conducted and the report submitted to the Commission Drilling and Production Department within 30 days of the completion of the test.
 - i) The Permit Holder must conduct biennial reservoir pressure tests of a minimum of one well, with a shut-in period of sufficient length to provide data for calculation of the reservoir pressure.
- 3 The permit holder must submit a progress report to the Commission for each twelve month period the scheme is in operation. The progress report must be filed within 60 days after the end of each period and must contain the following :
- i) the daily average rate during each month of oil production for each producing well, and for the scheme as a whole
 - ii) the average gas-oil and water-oil rates during each month for each producing well, and for the scheme as a whole

- iii) the monthly cumulative gas, oil and water production for each producing well, and for the scheme as a whole
- iv) for each type of fluid being injected, the daily average rate of injection per operating day during each month into each injection well, and for the scheme as a whole
- v) for each type of fluid being injected, the weighted average wellhead injection pressure during each month for each injection well, and for the scheme as a whole
- vi) for each type of fluid being injected, the monthly cumulative volume of fluid injected to each injection well, and for the scheme as a whole
- vii) the current volumetrically weighted formation pressure for the scheme as a whole and a copy of the isobaric map from which this pressure was calculated
- viii) the date and type of any well treatment or workover which must be indicated, in the case of injection wells, on the report of the injected volume, and in the case of producing wells, on the report of the daily average oil production rate
- ix) calculations of the balance during each month between fluids injected into, and fluids withdrawn from, the part of the pool subject to the scheme and by individual patterns, where applicable
- x) an outline of the method actually in use for the quality control and treatment of fluid being injected, or, where there has been no change in the control or treatment from that outlined in a previous report, a statement to that effect



Richard Slocomb
Deputy Commissioner, Engineering
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 14 day of January 2014.

IN THE MATTER of an application from Canadian Natural Resources Ltd. to the Commission dated November 29, 2013, for Other Than Normal Spacing.

ORDER 04-09-003-OTN (AMENDMENT #2)

- 1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing within the Peejay West – Halfway “C” pool is hereby approved within the following area;
94-A-15 Block G – Units 11, 21.
Block H – Units 10, 20 and 30.
- 2 Under section 65.1(3) of the *Petroleum and Natural Gas Act*, I specify the following:
 - a) the target area for an oil well completed within the project area is not nearer than 100 m to the sides of the Other Than Normal Spacing area,
 - b) an oil well completed outside the specified target area may be subject to an off-target production penalty,
 - c) oil wells drilled within the specified project area are not subject to spacing requirements.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 13th day of January 2014.