

November 3, 2020

1400-7400-59240-09

Tyler Reid, P.Eng.
Exploitation Engineer
PETRONAS Energy Canada Ltd.
1600, 215-2nd St SW
Calgary, AB T2P 1M4

Dear Mr. Reid:

**RE: PRESSURE MAINTENANCE WATERFLOOD ORDER 93-09-001 AMENDMENT #2
BLUEBERRY FIELD – DEBOLT ‘E’ POOL**

The Commission is presently reviewing and amending waterflood approvals to conform to current requirements. The continued operation of a pressure maintenance waterflood in the Blueberry field – Debolt ‘E’ pool by PETRONAS Energy Canada Ltd. (Petronas) requires this review.

The discovery well, Petronas et al Blueberry d-82-L/94-A-12 (WA 205), was drilled in February 1957 and began production in January 1958. Approval for waterflood was granted in November 1993 for the Debolt B pool. The Debolt ‘B’ pool was split into the B and E pools in April 2000 and a GEP approval was granted for the ‘E’ pool. In May 2013, the PMWF approval was amended to combine GEP with the PMWF and apply to just the ‘E’ pool. Currently all five wells in the project are suspended. The Commission understands that a production restart date remains uncertain due to current economics.

The following Orders are attached;

- 1) Order 93-09-001 Amendment #2 designating Pressure Maintenance Waterflood within the Blueberry field – Debolt ‘E’ pool, as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 93-09-001 Amendment #2 - OTN approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject area and formation.

This amended approval includes a maximum wellhead injection pressure (MWHIP) of 17,275 kPa, consistent with current requirements. The ultimate reservoir pressure is limited to the initial pool pressure. Injection is restricted to the purpose of oil recovery and biennial reservoir pressure testing is required. As the reservoir pressure has not been measured since 2011, condition 2d) requires that reservoir pressure be obtained within 6 months of recommencing injection operations.

The Commission requests to be notified by Petronas if it is decided that injection operations will not recommence.

Should you have any questions, please contact Logan Gray at (250) 419-4465 or the undersigned at (250) 419-4430.

Sincerely,



Ron Stefik, EngL
Supervisor, Reservoir Engineering
Oil and Gas Commission

Attachments

ORDER 93-09-001 – Amendment #2

1. Under Section 75 (1) (a) of the *Oil and Gas Activities Act*, the Commission designates by Order the development and production of petroleum and natural gas from a pool using pressure maintenance waterflood enhanced recovery project within the Blueberry field – Debolt 'E' pool following area;

NTS 94-A-12: Block L – units 61, 71, 81, 82, 92, 93

NTS 94-A-13: Block D – units 2 - 4

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:
 - a) The project unadjusted daily oil allowable (UDOAA) is 88.0 m³.
 - b) All associated produced gas must be conserved.
 - c) Water may be injected into the well Petronas et al Blueberry d-93-L/94-A-12 (WA 1242), interval 2,034.8 – 2,048.2 mKB.
 - i) Inject only through tubing with a packer set as near as is practical above the injection interval.
 - ii) Not exceed an injection pressure, measured at the wellhead of 17,275 kPag or the pressure required to fracture the formation, whichever is lesser.
 - d) A reservoir pressure measurement must be obtained from at least one project well within 6 months of recommencement of injection operations and then at an interval of every 2 years. Results must be submitted to the Commission within 60 days of completion of the tests via e-submission.
 - e) Not exceed an average pool pressure of 19,075 kPaa measured at 1,241.0 meters subsea.
 - f) Cease injection and notify the Commission at Reservoir@bcogc.ca immediately if there are any indications that hydraulic isolation is lost in the injection wellbore or formation.
 - g) Include the monthly injected volume, injection hours, and the maximum injection pressure value for the injection well via Petrinex.
 - h) Injection must cease upon termination of production from the pool.

Advisory Guidance for 93-09-001 – Amendment #2

- 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 completed and 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 injection statement must be submitted to Petrinex not later than the 20th 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 injection operations suspended as per section 21.1 of the Drilling and Production Regulation.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 3rd day of November 2020.



ORDER 93-09-001 – Amendment #2 – OTN

1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing within the Blueberry field – Debolt ‘E’ pool is hereby approved within the following area;

| | | |
|-----|----------|----------------------------------------|
| NTS | 94-A-12: | Block L – units 61, 71, 81, 82, 92, 93 |
| NTS | 94-A-13: | Block D – units 2 – 4 |

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.

A handwritten signature in blue ink, appearing to read 'R Stefik'.

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

DATED AT the City of Victoria, in the Province of British Columbia, this 3rd day of November 2020.