

March 27, 2019

3425-2800-32640-02

James Munro, P.L(Eng.)  
Tourmaline Oil Corp.  
3700, 250 – 6<sup>th</sup> Avenue SW  
Calgary AB T2P 3H7

Dear Mr. Munro:

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT  
TOURMALINE DOE 12-28-80-15 W6M (WA #23533)  
DOE FIELD - CADOMIN FORMATION**

Oil and Gas Commission staff have reviewed the application, dated January 15, 2019 requesting approval to dispose of produced water into the Cadomin formation of the subject well.

The subject vertical well was drilled in December 2007 into the Kiskatinaw formation, perforated and swabbed but the gas rate was TSTM. In July 2010, the well was recompleted in the Montney formation producing only for one month before it was suspended. Tourmaline purchased the well in April 2011 to complete as a Bluesky & Cadomin water source well for which it was used for one month. The Bluesky formation was suspended and the well was recompleted as a Cadomin water disposal well. Continuous development in the Doe area created the need for additional water disposal resulting from fracture treatment flowback water and produced water. Test results confirm this wellbore and the Cadomin formation are suitable for disposal operations.

Attached please find **Order 19-02-006**, designating an area in the Doe field – Cadomin 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 includes a number of detailed operational conditions including: continuous tubing and casing pressure measurements, a maximum wellhead injection pressure, an ultimate reservoir pressure limit, as well as wellbore integrity monitoring and reporting requirements. 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).

The Commission advises disposal well permit holders to monitor seismic events in proximity to the well and be prepared to modify operations to mitigate induced seismicity. Permit holders may monitor seismic events through the Natural Resources Canada seismic monitoring network at <http://www.earthquakescanada.nrcan.gc.ca/recent/index-eng.php>.

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 Petra Kriescher-Trudgeon at (250) 419-4415 or Ron Stefik at (250) 419-4430.

Sincerely,



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

Attachment




ORDER 19-02-006

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 disposal of produced salt water into the Cadomin formation – Doe field as a special project in the following area:

DLS Twp 80 Rge 15 W6M Sec 28 Lsds 11 - 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, including well flowback completion fluids only into the vertical well Tourmaline Doe 12-28-80-15 W6M; WA# 23533 – Cadomin formation (perfs. 1304.0 to 1307.0 mKB MD).
- b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 13,700 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) 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) Conduct and submit an annual Surface Casing Vent Flow test to the Commission within 30 days of the completion of the test.
- h) Include the disposal operating hours and the maximum injection pressure value on the monthly Petrinex disposal report.
- i) Conduct a reservoir pressure test on the formation in the subject well annually, 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 14,600 kPaa measured at 1300.1 mCF.
- 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 injection.  
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 injection.
- 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 27<sup>th</sup> day of March, 2019.

Advisory Guidance for Order 19-02-006

- 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.