

February 4, 2014

9045-7400-32640-02

R.E. (Bob) Overfield  
Project Executive, Production  
Imperial Oil Resources  
237, 4<sup>th</sup> Ave SW  
Calgary AB T2P 3M9

Dear Mr. Overfield,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT  
IMP SNAKE b-019-F/094-O-02; WA# 28249  
DEBOLT FORMATION**

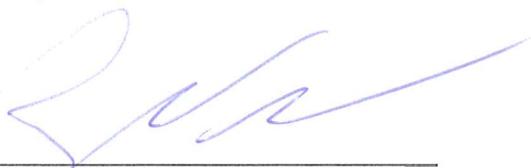
Oil and Gas Commission staff have reviewed the application, dated December 19, 2013, requesting approval to dispose of produced water into the Debolt/Rundle Group formation of the subject well.

The subject well, rig released December 16, 2013, was drilled for the purpose of disposal of water produced and contained at surface during a well event that occurred on IMP D HZ Snake River b-B19-F/094-O-02 (WA #29108). This disposal well may also support future area development. The disposal well b-19-F is cased to the top of the Debolt at 354.5 m and left open hole to total depth of 431m KB. Due to incomplete cement bond below 225m, only temporary approval for produced water disposal into the Debolt formation is granted at this time. Temperature logs conducted after 10,000 m<sup>3</sup> and 35,000 m<sup>3</sup> cumulative disposal injection volumes are required to confirm hydraulic isolation of the Debolt formation and, if satisfactory, will allow removal of the temporary limit of this disposal approval. The maximum allowed wellhead injection pressure of 2,500 kPa is based on a disposal rate of 1000 m<sup>3</sup>/d and 90% of the maximum tested bottomhole pressure of 6,608 kPa.

Attached find **Order 14-02-001** designating an area in the Horn River field – Debolt formation as 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, including well stimulation flowback fluid. This Order includes a number of detailed operational conditions, including: maximum wellhead injection pressure, ultimate reservoir pressure limit, wellbore integrity testing and reporting requirements. Additional general information regarding disposal wells is available on the Commission's website at <http://bcogc.ca/node/5997/download>.

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

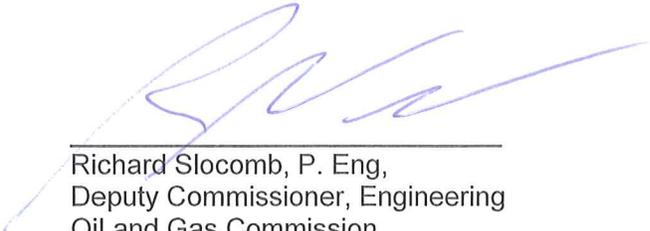
Attachment

ORDER 14-02-001

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

NTS 94-O-2 Block F Unit 19.

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 locally stored tank and borrow pit water, only into the well IMP SNAKE b-019-F/094-O-02 (Well Permit # 28249), Debolt formation (354.5 mKB to 431.0 mKB).
  - b) Inject a total cumulative volume of not more than 45,000 m<sup>3</sup>.
  - c) Conduct a temperature log after 10,000 m<sup>3</sup> of cumulative disposal volume and after 35,000 m<sup>3</sup> of cumulative disposal volume and submit to the OGC within 7 days of completion of each test.
  - d) Not exceed an injection pressure, measured at the wellhead on the subject well, of 2,500 kPag or the pressure required to fracture the formation, whichever is lesser.
  - e) Inject only through tubing.
  - f) Continually measure and record the wellhead casing and tubing pressures.
  - g) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
  - h) Submit the annual packer isolation test, as detailed in AER Directive 51 (Draft) and report to the Commission within 30 days of the completion of the test.
  - i) Include the disposal operating hours and the maximum injection pressure values on the monthly disposal statement.
  - j) Cease injection upon reaching a maximum formation pressure of 5,684 kPaa.
  - k) Conduct a reservoir pressure test on the Debolt formation in the subject well following the conclusion of disposal of locally stored fluids, 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.
  - 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 4<sup>th</sup> day of February, 2014.

Advisory Guidance for Order 14-02-001

- 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 25<sup>th</sup> day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.