

July 29, 2021

7750-2800-32640-02

Spencer Saurette, P.Eng.  
Exploitation Engineer BC South  
Canadian Natural Resources Ltd.  
2100, 855 – 2<sup>nd</sup> Street SW  
Calgary, Alberta T2P 4J8

Dear Mr. Saurette,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL  
CNRL HZ SEPTIMUS H5-23-81-19 W6M; WA# 35457  
SEPTIMUS FIELD – CADOMIN FORMATION**

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Approval for disposal of produced water was issued for the subject well, Cadomin formation, on March 18, 2018. Disposal operations at this site have consistently been within the Order limits, with a total disposal volume of 442,500 m<sup>3</sup>.

Seismic events can occur as a result of disposal operations if fault orientation and rock stresses are favorable for movement. Recent seismic events in the area of the subject well may be due to disposal activities. Existing near-field seismometers are sufficient to accurately locate event hypocenters and enable study of the seismicity cause and potential mitigations. Monthly reporting on recorded events is required beginning August 31, 2021, as per order condition 2f). This Order amendment establishes the reporting criteria for seismic monitoring, as well as updates to other various conditions.

Attached please find **Order 18-02-005 Amendment #1** designating an area in the Septimus 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.

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

Sincerely,



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

Attachment

## ORDER 18-02-005 Amendment #1

- 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 the disposal of produced water, including flowback from fracturing operations, into the Cadomin formation – near the Septimus field as a special project in the following area:  

DLS        Twp 81 Rge 19 W6M Section 23 - Lsds 1, 2, 3, 4, 5, 6, 7 and 8
- 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 only into the well CNRL HZ Septimus H5-23-81-19; WA# 35457 – Cadomin formation (open hole from 1267.0 to 2539.0 mKB MD).
  - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 14,800 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 at [Reservoir@bcogc.ca](mailto:Reservoir@bcogc.ca) immediately if there are any indications that hydraulic isolation is lost in the wellbore or formation.
  - f) Report the results of seismicity monitoring, including date, time, location, magnitude, ground acceleration and depth of any seismic events, to the Oil and Gas Commission (Commission) via email to [Ron.Stefik@bcogc.ca](mailto:Ron.Stefik@bcogc.ca) and [Jeff.Johnson@bcogc.ca](mailto:Jeff.Johnson@bcogc.ca). at 1 month intervals, commencing August 31st.
  - 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 volumetric report.
  - i) Conduct an annual reservoir pressure test on the formation in the subject well, 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 12,320 kPaa, measured at 1066.6 mKB TVD.
  - 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 disposal.

- 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 disposal.
- l) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 29<sup>th</sup> day of July, 2021.

**Advisory Guidance for Order 18-02-005 Amendment #1**

- 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 conducted and the associated report must be submitted to the Commission within 30 days of test completion, 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 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.
- V. Seismic events must be reported and disposal operations suspended as per section 21.1 of the Drilling and Production Regulation.