

February 14, 2020

8120-2010-32640-02

Noel Millions, PSL
Sr. Advisor, CAN Government Relations
Ovintiv Canada ULC
500 Centre Street SE, PO Box 2850
Calgary, Alberta T2P 2S5

Dear Mr. Millions,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL
OVV CRP HZ SUNRISE A1-27-78-17; WA# 29739
SUNRISE FIELD – PADDY-CADOTTE 'A' POOL**

The Commission has reviewed the application from Ovintiv Canada ULC (Ovintiv), dated October 7th, 2019, requesting an increase in the maximum reservoir storage pressure in the Paddy-Cadotte formation for four disposal wells in the Sunrise field, including the subject well, and modification to the reservoir pressure testing requirement for individual wells with consideration to measurements from eight proximal water source wells completed in the same formation. Ovintiv's formal application followed a presentation to Commission staff at our offices on September 12, 2019. The application is in response to Commission correspondence to Ovintiv dated July 4, 2019, which previously noted reservoir pressures approaching limit values in the associated Section 75 Special Project approval Orders.

The subject well was drilled horizontally and completed into the Paddy-Cadotte formation in May, 2014 as a water source well. Water, and by-product gas, were produced until February 2017. In October 2018, the well was approved for an extended injectivity test under Order 18-02-009 which was amended in November 2018 to allow for disposal of produced water. The well began disposal in December of 2018 and has continued to date.

Attached please find **Order 18-02-009 Amendment #2**, designating an area in the Sunrise field, Paddy-Cadotte 'A' pool, 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. Order condition 2h) i) requires bi-annual reservoir pressure tests on the subject well. This testing frequency is contingent upon adherence to condition 2h) ii), the collection and reporting of monthly reservoir pressure from Ovintiv's eight proximal Paddy-Cadotte water source wells. Order condition 2i) raises the maximum allowed formation pressure to a value equal to a hydrostatic column of water to surface elevation. All other conditions remain unchanged.

In certain circumstances, disposal well operation may induce seismicity of values that require modification of operations to mitigate.

Disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure

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

Sincerely,



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

Attachment

ORDER 18-02-009 Amendment #2

- 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 Sunrise field – Paddy-Cadotte 'A' pool as a special project in the following area:

DLS Twp 78 Rge 17 W6M Section 27 – Lsds 1 to 8 and 11 to 14
 Twp 78 Rge 17 W6M Section 28 – Lsds 9 to 16

- 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 water into the well OVV CRP HZ Sunrise A1-27-78-17; WA# 29739 – Paddy-Cadotte 'A' pool 1404.0 – 3504.0 mKB MD.
- b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 13,425 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) Include the disposal operating hours and the maximum injection pressure value on the monthly Petrinex disposal statement.
- f) Cease injection and notify the Commission immediately if there are any indications that hydraulic isolation is lost in the wellbore or formation.
- g) Conduct and submit an annual surface casing vent flow test report to the Commission within 30 days of the completion of the test.
- h) i) Conduct a reservoir pressure test on the formation in the subject well at least once every two calendar years, 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.
 ii) Once a month, report to the Commission the reservoir pressure obtained from the bottom hole recorders in each of the following water source wells:

| | |
|---------------------------------|----------|
| OVV CRP Sunrise 14-13-78-16 | WA 22874 |
| OVV CRP HZ Sunrise A13-33-78-17 | WA 26471 |
| OVV CRP HZ Sunrise 9-34-78-17 | WA 28495 |
| OVV CRP HZ Sunrise A9-34-78-17 | WA 28496 |
| OVV CRP HZ Sunrise A5-29-78-16 | WA 29717 |
| OVV CRP HZ Sunrise A4-28-78-17 | WA 29726 |
| OVV CRP HZ Sunrise B1-27-78-17 | WA 29740 |
| OVV CRP HZ Sunrise 8-31-78-16 | WA 30814 |

- i) Cease injection upon reaching a maximum formation pressure of 8,750 kPaa, measured at 1008.6 mKB TVD.
- j) 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.

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



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

DATED AT the City of Victoria, in the Province of British Columbia, this 14th day of February, 2020.

Advisory Guidance for Order 18-02-009 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 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 25th 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.