

August 20, 2024

3425-6200-59240-16

Adam Barker
Interim Operations Supervisor
NorthRiver Midstream Inc.
Suite 1400, 888 – 3rd Street S.W.
Calgary, Alberta T2P 5C5

Dear Mr. Barker:

**RE: ACID GAS DISPOSAL APPROVAL 09-16-001 AMENDMENT #3
NORTHRIVER DOE 15-24-80-15 W6M; WELL PERMIT #23946
DOE FIELD – BELLOY FORMATION**

The subject well is approved for deep disposal of by-product acid gas (H₂S & CO₂), as Special Project Order Approval #09-16-001 Amendment #2 under section 75 of the Energy Resource Activities Act.

On November 15, 2023, the BCER received a request from NorthRiver seeking to change the reservoir pressure testing requirement, condition 2(n), from a 4-year interval to 5 years. Reservoir pressure testing will be coordinated with plant maintenance shutdowns each 5 years, providing a period of reservoir pressure stabilization for effective testing. Over 14 years of cumulative injection resulted in a small increase of 500 kPa pressure in the Belloy reservoir, indicating excellent fluid dispersion and storage capacity.

Over the past 7 years, Lower Middle Montney gas samples have been collected and reviewed for acid gas content. The history of samples provides clear indication that there is no connection between the disposal zone and the Montney.

Attached please find **Order 09-16-001 Amendment #3** designating an area in the Doe field Belloy formation, for the operation and use of a storage reservoir for the disposal of acid gas. The frequency of reservoir pressure testing has been amended to 5-year intervals. The prior monitoring requirement, Order condition 2(i) for acid gas in the Lower Middle Montney has been removed. Amendment #2 Order condition 2(h) required an inspection of the disposal well, which was completed January 24, 2018 and is no longer necessary. No other changes have been made to the approval conditions.

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

Sincerely,



Ron Stefik, P.L. Eng.
Supervisor, Reservoir Engineering
BC Energy Regulator

Attachment

ORDER 09-16-001 AMENDMENT #3

- 1 Under Section 75(1)(c.1) of the *Energy Resource Activities Act*, the Regulator designates the Belloy formation as a special project for the operation and use of a storage reservoir for the disposal of acid gas within the following area:

DLS TWP 80 RNG 15 W6M Sec 24.

- 2 Under section 75(2) of the *Energy Resource Activities Act*, the special project designation in this Order is subject to the following conditions. The Permit Holder shall:

Well Details

- a) Inject acid gas only into the well NorthRiver Doe 15-24-80-15; WA 23946 – Belloy formation (2178.0 – 2205.0 mKB).

Operating Limits

- b) Limit the maximum H₂S concentration in the injection fluid stream to 90%
- c) 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.
- d) Inject only through tubing with a packer set as near as is practical above the injection interval.
- e) Continually measure and record the wellhead casing and tubing pressures electronically, including when the disposal well is inactive or suspended.
- f) Alarm the annulus pressure monitoring system to indicate when casing pressure varies outside the normal operating range by greater than 1,000 kPa.
- g) Cease injection upon reaching a maximum formation pressure of 25,960 kPaa measured at MPP of 2191.5 mKB.

Monitoring

- h) Sample the disposal fluid and submit composition analysis at least twice annually, indicating the disposal well as the sample source.
- i) Submit the annual packer isolation test report to the Regulator within 30 days of the completion of the test.
- j) Conduct and submit an annual Surface Casing Vent Flow test to the Regulator within 30 days of the completion of the test.
- k) Include the disposal operating hours, the maximum daily average injection pressure, and the minimum daily average temperature values on the Petrinex monthly submission.
- l) Maintain seismic ground motion monitoring on the wellsite with capability to measure events as indicated in this document <http://www.bcogc.ca/node/13256/download>.
- m) At each scheduled facility maintenance shut-down and at an interval of no greater than 5 years, conduct a 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.

Wellbore Integrity

- n) Ensure a Wellhead Emergency Shut-Off Device and Subsurface Safety Valve (SSSV) are installed to operate “fail-safe” and are linked to H₂S detection at the wellhead.
- o) Implement appropriate corrosion and freeze protection measures in the casing-tubing annulus.
- p) Conduct function testing of SSSV at least annually, or as recommended by API 14B or the manufacturers - whichever requires more rigorous function testing.
- q) Conduct SSSV retrieval and inspection as per API 14B or the manufacturers recommended practice – whichever is more rigorous.
- r) Annually confirm the Subsurface Safety Valve is capable of activation remote from the wellhead.
- s) Immediately suspended all injection operations if any injection equipment, monitoring equipment or safety devices considered necessary for safe operation should fail.
- t) Cease injection and notify the Regulator immediately if hydraulic isolation is lost in the wellbore or formation.
- u) Perform casing inspection log on the subject well and submit results to the Regulator within 30 days of the completion of logging, at the next scheduled facility maintenance shut-down. Subsequently at an interval of not more than 10 yrs. Through tubing logging is acceptable.
- v) Perform a hydraulic isolation temperature log on the subject well and submit results to the Regulator within 30 days of the completion of logging, at the next scheduled facility maintenance shut-down. Subsequently at an interval of not more than 5 years.
- w) Install a barricade around the wellhead that is capable of withstanding vehicle collision.
- x) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
- y) Submit a Progress Report to the Regulator for each six month period the project is in operation. The Progress Report must be filed within 60 days after the end of each period and must contain the information specified in the Acid Gas Progress Report Requirements document found on the BCER website here: <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.
- z) Prior to abandonment of the disposal zone or well, conduct a 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.



Ron Stefik, P.L. Eng
Supervisor, Reservoir Engineering
BC Energy Regulator

DATED AT the City of Victoria, in the Province of British Columbia, this 20th day of August 2024.

Advisory Guidance for Order 09-16-001 Amendment #3

- 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 Regulator not later than the 25th day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.
- V. All fluid analyses must be submitted with 30 days of tests as per section 34(5)(a) of the Drilling and Production Regulation.