6400-4800-59240-16



June 3, 2022

Cassidy Nyman Production Engineer, BC North Canadian Natural Resources Ltd. Suite 2500, 855 - 2 Street SW Calgary, AB T2P 4J8

Dear Cassidy Nyman:

# RE: ACID GAS DISPOSAL APPROVAL AMENDMENT #1 CNRL HZ NIG c-38-G/94-H-4; WA# 37395 NIG CREEK FIELD – HALFWAY FORMATION

The subject well was approved for disposal in November of 2019 and has operated within the order conditions. Condition 2 p) of the Order required removal and inspection of the subsurface safety valve to ensure functional competence. However, upon review of surface testing capabilities, the Commission has confirmed American Petroleum Institute (API) standard 14B allows the valve to be function and leak tested without retrieval.

Attached please find **Order 19-16-001 Amendment #1**, designating an area in the Nig Creek field – Halfway 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 acid gas. An additional Order change, condition 2 f), clarifies the casing pressure alarm.

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).

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

Sincerely,

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



## ORDER 19-16-001 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 acid gas in the Nig Creek field – Halfway formation as a special project in the following area:

NTS	94-H-4:	Block F - units 31 and 41
		Block G - units 38-40 and 48-50

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:

#### Well Details

a) Inject acid gas only into the well CNRL HZ Nig c-38-G/94-H-4; WA 37395 – Halfway formation (1686.2 – 3117.6 mKB MD).

#### **Operating Limits**

- b) Limit the maximum H<sub>2</sub>S concentration of the disposal fluid stream to 85%.
- c) Not exceed an injection pressure, measured at the wellhead on the subject well, of 12,675 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 no greater than 500 kPa.
- g) Cease injection upon reaching a maximum formation pressure of 14,275 kPaa measured at MPP of 1502.9 mKB TVD.

## Monitoring

- h) Complete an inspection, satisfactory to the Commission, within 4 weeks of initial disposal operations.
- i) Sample the disposal fluid and submit composition analysis at least twice annually, indicating the disposal well as the sample source.
- j) Conduct and submit an annual Surface Casing Vent Flow test to the Commission within 30 days of the completion of the test.
- k) Include the disposal operating hours, the maximum injection pressure and the minimum temperature values on the monthly Petrinex disposal report.
- At each scheduled facility maintenance shut-down and at an interval of no greater than 4 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.



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#### Wellbore Integrity

- m) Ensure a Wellhead Emergency Shut-Off Device and Subsurface Safety Valve (SSSV) are installed to operate "fail-safe" and are linked to H<sub>2</sub>S detector heads at the wellhead.
- n) Implement appropriate corrosion and freeze protection measures in the casing-tubing annulus.
- c) Conduct function testing and a leak rate calculation of SSSV at least annually, as recommended by API 14B or the manufacturer - whichever requires more rigorous function testing.
- p) Annually confirm the Subsurface Safety Valve is capable of activation remote from the wellhead.
- q) Immediately suspended all injection operations if any injection equipment, monitoring equipment or safety devices considered necessary for safe operation should fail.
- r) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
- s) i) Perform 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 10 years, commencing from the date of initial disposal. Through tubing logging is acceptable.

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 5 years, commencing from the date of initial disposal.

- t) Install a barricade around the wellhead that is capable of withstanding vehicle collision.
- u) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
- v) Submit a Progress Report to the Commission 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 OGC website here: <u>http://www.bcogc.ca/industryzone/documentation/Subsurface-Disposal</u>.
- w) 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.
- x) Do not remove the packer in the subject well unless approved to do so by the Commission.

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 3<sup>rd</sup> day of June, 2022.



## ORDER 19-16-001 Amendment #1

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Advisory Guidance for Order 19-16-001 Amendment #1

- 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 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 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. All fluid analyses must be submitted with 30 days of tests as per section 34(5)(a) of the Drilling and Production Regulation.
- VI. Seismic events must be reported and disposal operations suspended as per section 21.1 of the Drilling and Production Regulation.