

Ryan Munro, P.Eng.
Manager, Abandonment Engineering
Canadian Natural Resources Ltd.
Suite 2100, 8800 – 2ST SW
CALGARY AB T2P 4J8

March 27, 2020

Dear Ryan Munro:

**Information Request No.1:
Application to Alter the Condition of a Well for the Abandonment of the
Arrowhead River I-75 well (ACW-2019-012-CNRL-I-75-WID1981)**

On February 28, 2020, the Office of the Regulator of Oil and Gas Operations (OROGO) received an electronic copy of a Well Approval application from Canadian Natural Resources Ltd. (CNRL) to Alter the Condition of a Well (ACW) for the abandonment of the Arrowhead River I-75 (WID 1981) well. In order to review CNRL's application, OROGO requires additional information, as set out in the attached Information Request No.1.

Please send your written responses and any associated correspondence to me by email at orogo@gov.nt.ca or through OROGO's secure file transfer site.

Please submit your response on or before 4:00 p.m. on April 30, 2020. If you are unable to respond within this timeframe or have any questions, please contact me at (867)767-9097 or by email at orogo@gov.nt.ca.

Sincerely,

Janpeter Lennie-Misgeld
Senior Advisor, Legislation and Policy

c. Arly Castillo, Regulatory Coordinator, CNRL

Canadian Natural Resources Ltd. (CNRL)
Application to Alter the Condition of a Well (ACW-2019-012-CNRL-I-75-WID1981)
Information Request No. 1

1.1 Detailed Operations Program

Preamble: Step 17 states “...*Pressure test pumping surface lines to the max well head working pressure (be sure not to exceed the MAWP of the lowest rated inline component)*”. All inline components should NOT be rated less than any proposed pressure test. Pressure testing is typically conducted to the well head pressure rating or formation pressure, whichever is the lesser.

Step 25 states “*Unseat hanger and release ON/OFF overshot from double grip packer. Monitor well response. Kill well as required.*” This process step does not provide sufficient detailed procedural steps to determine how CNRL proposes to kill the well.

Step 26 states “*Confirm with Abandonment Superintendent if a scraper run is required based on well conditions.*” This process step does not provide sufficient detail to determine how CNRL would ensure that the internal surface of the casing is free of debris and/or scaling if a scraper run is NOT completed before installing the bridge plug.

Step 34 states “...*Cap bridge plug with minimum 30 vertical metres (620 litres) of cement circulated into place with fresh water*”. This process step does not provide sufficient detail to determine the method(s) to be used for the preparation, introduction and circulation of the cement when placing the required 30 metres of circulated cement.

Request: Please submit an updated abandonment program that provides sufficient detail to determine how CNRL proposes to:

- 1) Safely conduct pressure testing of pumping surface lines as stated in Step 17;
- 2) Kill the well as stated in Step 25;
- 3) Ensure that the internal surface of the casing is free of debris and/or scaling if a scraper run is NOT completed before installing the bridge plug as stated

in Step 26; and

- 4) Prepare, introduce and circulate the cement when placing the required 30 metres of circulated cement as stated in Step 34.

1.2 Isolation of Porous Zones

Preamble: CNRL's abandonment program identifies four perforated porous zones (Slave Point, Watt Mountain, Headless and Landry) in the open hole section of the well. The abandonment program does not demonstrate how CNRL would ensure compliance with section 56 of *the Oil and Gas Drilling and Production Regulations* (OGDPR), which requires the isolation of all oil or gas bearing zones and discrete pressure zones.

Request: Please submit an updated abandonment program that provides sufficient operational and geological detail to determine how CNRL will ensure isolation all porous zones in the open hole section of the well.

1.3 Flaring and Venting

Preamble: The Arrowhead River I-75 well has reported significant shut in tubing pressure at the well head (2019 Well Inspection Report – SITP = 2708 kPa), indicating the requirement to bleed off the pressure as noted in Steps 18 and 24 of the well abandonment program. The well abandonment program, however, does not appear to anticipate or document the procedures for flaring or venting when bleeding off pressure from the well bore. Section 67(a) of the OGDPR states that no operator shall flare or vent gas unless “it is otherwise permitted in the approval...”

Request: Please provide an explanation how the well abandonment operations will be conducted without the need to flare or vent or provide an updated abandonment program that includes procedures for safely flaring or venting the well along with estimates of the rate, quantity and period of flaring or venting that may be required.