BC Oil & Gas COMMISSION

June 8, 2021 3200-8400-32640-02

Angela Boston
Consultant
Clarke Lake Geothermal GP Ltd.
RR1 Mile 295 Alaska Highway
2026 Kennay-Yah Road
Fort Nelson, BC V0C 1R0

Dear Ms. Boston:

RE: PRODUCED WATER DISPOSAL TEMPORARY USE SPECIAL PROJECT APPROVAL
CLG-GP CLARKE c-87-I/94-J-10 (WA #10637)
CLARKE LAKE FIELD – SLAVE POINT 'A' POOL

The Commission reviewed and responded to a pre-application submitted by Remedy Energy Services Inc., on behalf of Clarke Lake Geothermal GP Ltd. (CLG), dated February 2nd, 2021, requesting temporary approval for produce water disposal in the Slave Point 'A' pool in the subject well to facilitate the production testing of a new geothermal well. Additional data was submitted on May 11th, 2021 to complete the application requirements.

The subject well was drilled in December of 1997 with a deviated well path into the Slave Point 'A' Pool. The well began gas production in January of 1998 and continued production until November of 2020, with 109 e^6m^3 of cumulative gas produced. The applicant plans to deepen the well from 1,911 mKB to 2,400 mKB prior to disposal use, likely including the underlying Pine Point formation for disposal. The Clarke Lake Slave Point 'A' pool has ongoing production from a number of wells and also disposal use. The Pine point formation is water saturated and in contact with the above Slave Point, acting as a single reservoir.

Attached please find **Order 21-02-003**, designating an area in the Clarke Lake field, Slave Point '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 injection of produced water. This Order includes a number of detailed operational, measurement and reporting conditions. 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). As no hydraulic isolation log has been done for the well, condition 2j) limits the use of this disposal well to a 60-day period. CLG may apply to amend this approval to allow for continued disposal in the future, which would include a hydraulic isolation log or a pre-approved alternative method to confirm hydraulic isolation.

For the inspection requirement of Order condition 2i), please arrange via email to OGCPipelines.Facilities@bcogc.ca.

Disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure. It is the responsibility of the permit holder make adjustments to wellhead injection pressure.

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

Sincerely,

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

Attachment

IN THE MATTER of the application from Remedy Energy Services Inc., on behalf of Clarke Lake Geothermal GP Ltd. to the Oil and Gas Commission dated May 11th, 2021 requesting disposal approval:

ORDER 21-02-003

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 produced water in the Clarke Lake field – Slave Point 'A' pool as a special project in the following area:

   NTS 94-J-10 Block I – Unit 87

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 CLG-GP Clarke c-87-I/94-J-10; WA# 10637 Slave Point and Pine Point formations from 1,888.6 – 2,400.0 mKB MD.

   b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 6,950 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 report.

   f) Cease injection and notify the Commission at Reservoir@bcogc.ca immediately if there are any indications that hydraulic isolation is lost in the wellbore or formation.

   g) Cease injection upon reaching a maximum formation pressure of 18,100 kPaa, measured at 2,138.0 mKB TVD.

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

   i) Schedule an inspection by the Commission, to be completed within 1 week of initial disposal operation.

   j) Disposal operations must cease after 60 days from the date of initial injection.

   k) Following installation of the packer and tubing, an annular pressure integrity test must be performed and passed prior to commencing injection.

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 8th day of June 2021.

Advisory Guidance for Order 21-02-003

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 via Petrinex not later than the 20th 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.