



September 21, 2017

8100-2800-32640-02

Mat Loewen
President
Albright Flush Systems Ltd.
P.O. Box 6148
Fort St. John, BC V1J 4H6

Dear Mr Loewen,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL; AMENDMENT #2
ABT W STODDART A10-09-087-21; WA# 14095
STODDART WEST FIELD – CADOMIN FORMATION**

Approval for disposal of produced water, Order 14-02-013, was issued for the subject well, Cadomin formation, on November 10, 2014, and subsequently amended on November 18, 2014 with Order 14-02-013 Amendment #1.

Attached please find **Order 14-02-013 Amendment #2**, designating an area in the Stoddart West field – Cadomin 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 produced water. This Order makes a number of changes to Order 14-02-13 Amendment #1, as follows. The ultimate reservoir pressure limit outlined in condition 2j) has been recalculated from top of perforations to MPP to be in line with current practices. A reservoir pressure measured on June 9, 2017 shows a pressure increase to 110% of initial pressure in two years of disposal. For this reason, annual reservoir pressure testing will be required under condition 2i) to ensure that the fill-up rate is being adequately monitored. In addition, a non-serious SCVF was noted on this well on June 14, 2017. Annual monitoring of the SCVF as per condition 2g) will ensure that any change in status will be promptly detected.

Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.

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 Michelle Harding at (250) 419-4493 or the undersigned at (250) 419-4430.

Sincerely,



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

Attachment

ORDER 14-02-013 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 Cadomin formation – Stoddart West field as a special project in the following area:

DLS Twp 87 Rge 21 W6M Section 9 - Lsds 9, 10, 15 and 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 produced water only into the well ABT W Stoddart A10-9-87-21; WA# 14095 – Cadomin formation (disposal perforations 1259.0 – 1273.0 mKB).
 - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 16,400 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) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
 - f) Submit the annual packer isolation test report to the Commission within 30 days of the completion of the test.
 - g) Conduct and submit an annual Surface Casing Vent Flow test to the Commission within 30 days of the completion of the test.
 - h) Include the disposal operating hours and the maximum injection pressure value on the monthly BC-S18 disposal statement.
 - i) Conduct an annual 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.
 - j) Cease injection upon reaching a maximum formation pressure of 12,780 kPaa, measured at 1266 mKB.
 - k) 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 7 years, commencing from the date of initial injection.
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 injection.
 - l) 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 2nd day of September, 2017.

Advisory Guidance for Order 14-02-013 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 submitted, 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.