

July 31, 2017

2000-4535-59240-09

Pete Beskas, P.Eng.
Manager NorthWest Alberta and BC
Whitecap Resources Inc.
3800, 525 – 8th Ave S.W.
CALGARY, AB T2P 1G1

Dear Mr. Beskas:

**RE: PRESSURE MAINTENANCE WATERFLOOD SPECIAL PROJECT –
AMENDMENT #15
OTHER THAN NORMAL SPACING ORDER – AMENDMENT #15
BOUNDARY LAKE FIELD – BOUNDARY LAKE “A” POOL - UNIT #1**

The Commission has reviewed the application, dated June 14, 2017, submitted by VZFOX Canada Ltd. on behalf of Whitecap Resources Inc., requesting the conversion of two oil production wells, Whitecap et al Boundary 14-29-084-13, WA 1060 and Whitecap et al Boundary 16-29-084-13, WA 1425, to water injectors within the Boundary Lake field, Boundary Lake “A” pool pressure maintenance waterflood project.

The Commission agrees that conversion of wells 14-29 and 16-29 to injector service will offset the noted pressure decline in the pattern area, increase sweep efficiency, and ultimately increasing oil recovery.

The following Orders are attached;

- 1) Order 64-09-003 Amendment #15 designating Pressure Maintenance Waterflood within the Boundary Lake field – Boundary Lake “A” pool, as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 64-09-003 Amendment #15 - OTN approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject area and formation.

The Commission is amending active waterflood project approvals, to conform to current requirements. This amended Order includes a maximum wellhead injection pressure, based on formation fracture gradient, fluid density and average depth to top of completion zone. Also included are an ultimate pool pressure limit, restriction of injection for the purpose of oil recovery, and submission of a packer isolation tests. Annual reservoir pressure tests are a requirement of the approvals previously granted for pool observation wells. Please note that this approval maybe amended. A list of current approved water injectors, including the wells 14-29 and 16-29, is included as Appendix ‘A’ to the Order.

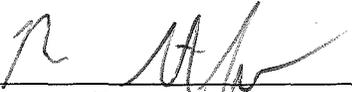
Please note that, as per section 75 of the *Drilling and Production Regulation*, a record of the volume of water injected in each well must be included on a Monthly Injection or Disposal Statement (BC-S18), which must be submitted to the Commission no later than the 25th day of the month in which activity occurred.

Reviewing the history of monthly reported wellhead injection pressure (WHIP) for each of the injectors, the Commission notes that the values are constant. This is unusual performance for

injectors. Please ensure that actual values are measured and recorded. The MWHIP on the monthly BC-S18 form is the maximum wellhead tubing pressure sustained for a period of 5 minutes or more.

Should you have any questions, please contact Petra Kriescher-Trudgeon at (250) 419-4415 or the undersigned at (250) 419-4430.

Sincerely,



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

Attachments

cc: Vick Saxon, VZFOXCanada

IN THE MATTER of an application from Whitecap Resources Inc. to the Commission dated June 14, 2017 for the production of oil using pressure maintenance (water injection).

ORDER 64-09-003 Amendment #15

1 Under section 75(1)(a) of the *Oil and Gas Activities Act*, the Boundary Lake field – Boundary Lake “A” pool is designated as a Special Project for the recovery of oil utilizing pressure maintenance waterflood within the following area;

Twp 84 Rge 13 W6M Fractional NW/4 Section 16, N/2 Section 17, Sections 18, 19, N/2 & SW/4 Section 20, Fractional NW/4 Section 21, Fractional Section 28, Sections 29, 30, 31, 32, Fractional Section 33

Twp 84 Rge 14 W6M NW/4 Section 2, Section 3, N/2 Section 4, N/2 Section 7, NW/4 Section 8, E/2 Section 9, Sections 10, 11, NW/4 Section 12, Sections 13, 14, 15, 16, 17, E/2 Section 18, E/2 Section 20, Sections 21, 22, 23, 24, 25, 26, 27, E/2 Section 28, N/2 & SE/4 Section 34, Sections 35, 36

Twp 85 Rge 13 W6M Fractional Section 4, Sections 5, 6, 7, 8, Fractional Section 9, Fractional Section 16, Section 17, S/2 Section 18, S/2 Section 20, Fractional SW/4 Section 21

Twp 85 Rge 14 W6M Sections 1, 2, 3, NE/4 Section 4, NE/4 Section 9, Sections 10, 11, NW/4 Section 12, SW/4 Section 13, Section 14, S/2 & NE/4 Section 15.

2 Under section 75(2) of the *Oil and Gas Activities Act*, I specify the following:

- a) The oil production volume for a month shall be based on the previous month's voidage replacement.
- b) All associated produced gas must be conserved.
- c) Water may be injected into the wells listed in Appendix 'A'.
 - i. For wells injecting other than fresh water, inject only through tubing with a packer set as near as is practical above the injection interval.
 - ii. Not exceed an injection pressure, measured at the wellhead of 14,300 kPa or the pressure required to fracture the formation, whichever is lesser.
- d) Not exceed an average pool pressure of 12,631 kPa measured at 533 meters subsea.
- e) Cease injection into a well listed in (c) and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
- f) Submit the annual packer isolation test report for wells listed in (c) to the Commission within 30 days of the completion of the test.
- g) Include the injection hours and the maximum injection pressure value for wells listed in (c) on the monthly BC-S18 form.
- h) Injection must cease upon termination of production from the pool.

Advisory Guidance for Order 64-09-003 Amendment #15

- 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 injection 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 injection operations suspended as per section 21.1 of the Drilling and Production Regulation.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 31st day of July 2017.

Appendix A: Approved Boundary Lake – Boundary Lake ‘A’ pool Unit #1 Water Injectors

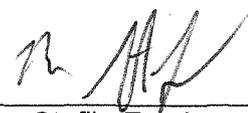
WA#	Well Name	UWI
227	Whitecap et al Boundary 11-10-85-14	100111008514W600
267	Whitecap et al Boundary 16-04-85-14	100160408514W600
356	Whitecap et al Boundary 16-11-85-14	100161108514W600
359	Whitecap et al Boundary 16-03-85-14	100160308514W600
369	Whitecap et al Boundary 16-31-84-13	100163108413W600
727	Whitecap et al Boundary 16-22-84-14	100162208414W600
770	Whitecap et al Boundary 08-01-85-14	100080108514W600
775	Whitecap et al Boundary 16-07-85-13	100160708513W600
776	Whitecap et al Boundary 16-01-85-14	100160108514W600
777	Whitecap et al Boundary 16-02-85-14	100160208514W600
780	Whitecap et al Boundary 06-22-84-14	100062208414W600
796	Whitecap et al Boundary 16-06-85-13	100160608513W600
797	Whitecap et al Boundary 16-35-84-14	100163508414W600
802	Whitecap et al Boundary 06-27-84-14	100062708414W600
803	Whitecap et al Boundary 06-14-84-14	100061408414W600
833	Whitecap et al Boundary 06-35-84-14	100063508414W600
846	Whitecap et al Boundary 16-34-84-14	100163408414W600
872	Whitecap et al Boundary 16-24-84-14	100162408414W600
882	Whitecap et al Boundary 16-05-85-13	100160508513W600
927	Whitecap et al Boundary 06-26-84-14	100062608414W600
939	Whitecap et al Boundary 16-32-84-13	100163208413W600
997	Whitecap et al Boundary 16-23-84-14	100162308414W600
1017	Whitecap et al Boundary 06-23-84-14	100062308414W600
1018	Whitecap et al Boundary 16-19-84-13	100161908413W600
1019	Whitecap et al Boundary 06-30-84-13	100063008413W600
1024	Whitecap et al Boundary 06-10-84-14	100061008414W600
1036	Whitecap et al Boundary 06-24-84-14	100062408414W600
1041	Whitecap et al Boundary 06-18-84-13	100061808413W600
1060	Whitecap et al Boundary 14-29-84-13	100142908413W600
1062	Whitecap et al Boundary 16-30-84-13	100163008413W600
1063	Whitecap et al Boundary 16-25-84-14	100162508414W600
1079	Whitecap et al Boundary 16-10-84-14	100161008414W600
1098	Whitecap et al Boundary 06-19-84-13	100061908413W600
1099	Whitecap et al Boundary 16-26-84-14	100162608414W600
1117	Whitecap et al Boundary 06-20-84-13	100062008413W600
1122	Whitecap et al Boundary 16-21-84-14	100162108414W600
1133	Whitecap et al Boundary 16-09-84-14	100160908414W600
1157	Whitecap et al Boundary 06-21-84-14	100062108414W600
1158	Whitecap et al Boundary 16-17-84-14	100161708414W600
1164	Whitecap et al Boundary 14-08-84-14	100140808414W600
1166	Whitecap et al Boundary 14-02-84-14	100140208414W600
1369	Whitecap et al Boundary 14-04-84-14	100140408414W600
1400	Whitecap et al Boundary 08-29-84-13	100082908413W600
1425	Whitecap et al Boundary 16-29-84-13	100162908413W600
2641	Whitecap et al Boundary 16-17-85-13	100161708513W600
3189	Whitecap et al Boundary 02-15-85-14	100021508514W600

IN THE MATTER of an application from Whitecap Resources Inc. to the Oil and Gas Commission dated June 14, 2017 for Other Than Normal Spacing.

ORDER 64-09-003 Amendment #15 - OTN

- 1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing is approved within the Boundary Lake field – Boundary Lake “A” pool within the following area;
 - Twp 84 Rge 13 W6M Fractional NW/4 Section 16, N/2 Section 17, Sections 18, 19, N/2 & SW/4 Section 20, Fractional NW/4 Section 21, Fractional Section 28, Sections 29, 30, 31, 32, Fractional Section 33
 - Twp 84 Rge 14 W6M NW/4 Section 2, Section 3, N/2 Section 4, N/2 Section 7, NW/4 Section 8, E/2 Section 9, Sections 10, 11, NW/4 Section 12, Sections 13, 14, 15, 16, 17, E/2 Section 18, E/2 Section 20, Sections 21, 22, 23, 24, 25, 26, 27, E/2 Section 28, N/2 & SE/4 Section 34, Sections 35, 36
 - Twp 85 Rge 13 W6M Fractional Section 4, Sections 5, 6, 7, 8, Fractional Section 9, Fractional Section 16, Section 17, S/2 Section 18, S/2 Section 20, Fractional SW/4 Section 21
 - Twp 85 Rge 14 W6M Sections 1, 2, 3, NE/4 Section 4, NE/4 Section 9, Sections 10, 11, NW/4 Section 12, SW/4 Section 13, Section 14, S/2 & NE/4 Section 15.

- 2 Under section 65.1(3) of the *Petroleum and Natural Gas Act*, I specify the following:
 - a) the target area for an oil well completed within the project area is not nearer than 100 m to the sides of the Other Than Normal Spacing area,
 - b) an oil well completed outside the target area specified in paragraph (a) may be subject to an off-target production penalty,
 - c) oil wells drilled within the specified project area are not subject to spacing requirements.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 31st day of July 2017.