



September 19, 2014

8120-2000/2200-32640-02

Randy Wolsey
Integrity Processing Inc
PO Box 6100
Fort St John, BC
V1J 4H6

Dear Mr. Wolsey,

**RE: NON-HAZARDOUS WASTE AND PRODUCED WATER DISPOSAL
SPECIAL PROJECT; AMENDMENT #1
INTEGRITY SUNRISE 10-24-078-17 W6M; WA# 19319
PADDY & CADOTTE FORMATIONS**

Approval for disposal of non-hazardous waste and produced water, Order 11-02-012 under the *Oil and Gas Activities Act (OGAA)*, was issued for the subject well, Paddy and Cadotte formations, on October 27, 2011. The Commission is presently amending disposal well approvals to conform to current requirements.

The subject well, drilled in March 2005, was unsuccessful for gas in the Dunvegan and Paddy/Cadotte formations. In May 2010 Integrity Processing Inc applied for an injectivity test on the Paddy/Cadotte formations. During the November/December 2010 workover, the uphole Dunvegan perforations were unsuccessfully cement squeezed. In August 2011, another cement squeeze was successfully completed on the Dunvegan. As noted above, approval for disposal was granted for the subject well in October 2011, however the well has not commenced disposal.

This disposal well addresses a need in the area for disposal of non-hazardous liquid waste. However, it is noted that high pressure injection above formation fracture pressure was required to pump fluids into the formation during the injection test. This indication of low permeability in the area is a concern as to the suitability for long term disposal operation. Condition 2 c) stipulates the maximum injection pressure on the subject well. Continuous monitoring is required to ensure this value is not exceeded.

Attached please find **Order 11-02-012 Amendment #1** designating an area in the Sunrise field – Paddy and Cadotte formations as a Special Project under section 75 of the *Oil and Gas Activities Act*, for the use of a storage reservoir for the disposal of non-hazardous waste and produced water. This Order contains a number of detailed operational conditions. Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.

The Paddy and Cadotte formations may be operated as an unsegregated interval, however monthly disposal volumes must be reported allocated as per Condition 2 h). Separate BC-11 forms must be submitted to the Commission for each formation at commencement of injection.

The Ministry of Environment identifies the type of effluent approved for injection in the separate Waste Discharge Permit, granted under the Environmental Management Act.

In certain circumstances, disposal well operation may induce seismicity. The Commission advises that disposal well permit holders monitor seismic events in proximity to the well and be prepared to modify operations to mitigate induced seismicity. Permit holders may monitor seismic events through the Natural Resources Canada seismic monitoring network at <http://www.earthquakescanada.nrcan.gc.ca/recent/index-eng.php>.

Should you have any questions, please contact the undersigned at (250) 419-4430 or Michelle Harding at (250) 419-4493.

Sincerely,



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

Attachment

cc: Sarah Penny, P.Eng., Gaines Consulting Ltd.

ORDER 11-02-012 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 non-hazardous waste and produced water, into the Paddy and Cadotte formations – Sunrise field as a special project in the following area:

DLS Twp 78 Rge 17 W6M Section 24 - 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 non-hazardous waste and produced water only into the well Integrity Sunrise 10-24-078-17; WA# 19319 – Paddy and Cadotte formations (perforation interval 937-990 mKB).
 - b) Hold a valid Permit under the Environmental Management Act for the disposal of non-hazardous waste.
 - c) Not exceed an injection pressure, measured at the wellhead on the subject well, of 9,050 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.
 - f) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
 - g) Submit the annual packer isolation test report 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. Report monthly disposal volumes 10% to the Paddy and 90% to the Cadotte.
 - 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 6,450 kPaa.
 - 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 10 years, commencing from the date of initial disposal.
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 disposal.
 - 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 day of September 2014.

Advisory Guidance for Order 11-02-012

- 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, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered, 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.