



March 17, 2016

8115-2010-32640-02

Aaron White  
Exploitation Engineer  
Murphy Oil Company Ltd.  
4000, 520 – 3<sup>rd</sup> Avenue SW  
Calgary AB T2P 0R3

Dear Mr. White:

**RE: HYDRAULIC FRACTURE IN PRODUCED WATER DISPOSAL WELL  
MURPHY SUNDOWN D16-01-78-18; (WA #26366)  
SUNDOWN FIELD – PADDY-CADOTTE FORMATION**

Oil and Gas Commission staff have reviewed your application, dated March 1, 2016, requesting approval to hydraulically fracture an active produced water disposal well. This vertical well was approved for disposal March 10, 2015. The well perforations may have been damaged by prolonged exposure to KCL fluid during completion operation, resulting in the subsequent poor injectivity. Murphy has requested approval to perform a hydraulic fracture by-pass this damage.

Condition 2 k) of disposal Order 15-02-004 stipulates the Commission must provide approval for hydraulic fracture stimulations on the disposal well. A provided fracture stimulation model report predicts the resulting geometry of the programmed 21 tonne frac treatment will remain in zone. This letter serves as approval to conduct the hydraulic fracture program as outlined in the proposal.

Prior to resuming disposal operations, Murphy Oil Company Ltd. must perform and submit a temperature log and a stabilized reservoir pressure static gradient test. Temperature log validity is dependent on following the procedure outlined in the [Water Service Well Summary doc](#) page 16.

A [Notice of Operations](#) is required before the recompletion begins. Also, submission of the test results is required as outline in the [Well Data Submission Requirements Manual](#).

Should you have any questions, please contact Michelle Gaucher at (250) 419-4482 or Ron Stefik at (250) 419-4430.

Sincerely,

A handwritten signature in black ink, appearing to read "Ron Stefik", written over a horizontal line.

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

Attachment