Geomechanical Effects of Cumulative Fluid Injection through Hydraulic Fracturing in the Kiskatinaw Seismic Monitoring and Mitigation Area (KSMMA), British Columbia

for the BC Oil and Gas Research and Innovation Society

ER-Seismic-2022-04

Plain Language Summary

by

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Enlighten Geoscience Ltd. conducted a two-part study of geological and geomechanical issues related to induced seismicity from hydraulic fracturing of the Montney formation in the Kiskatinaw Seismic Monitoring and Mitigation Area (KSMMA) in British Columbia. In the first part of the study, map animations were created to examine the volumes of liquids both injected into and produced from the Montney formation as a whole and its four major sub-divisions from 2008 to 2020. The results showed that although a large volume of liquid has been injected into the Montney through hydraulic fracturing, in most areas a larger volume of fluid has been removed from it over the same period. This has resulted in a reduction in subsurface pressures in many areas, which reduces the risk of induced seismicity. The second part of the study examined seismic activity associated with multiple wells drilled from a single pad from 2019 to 2021. The results suggest that subsurface stress changes during well completions may provide an indicator of the risk of induced seismic events. Changes in induced seismicity over time at the pad indicate the positive effect of mitigation efforts.

