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**AN OVERVIEW OF INDUCED SEISMICITY IN NORTHEAST BRITISH COLUMBIA: REGULATOR RESPONSE AND LESSONS LEARNED**

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Since 1985, northeast British Columbia has experienced induced seismicity triggered by waterflood injection, waste water disposal and fluid injection during hydraulic fracturing. In December, 2014, the British Columbia Oil & Gas Commission (Commission) published its 'Investigation of Observed Seismicity in the Montney Trend'. This report summarizes induced events recorded since August 2013 and covers seven areas in northeast British Columbia currently being monitored for induced events. Two of these areas have clusters triggered by waste water disposal in the Mississippian Debolt zone. The other five areas, all within the Triassic, Montney shale gas trend, have event clusters triggered by fluid injection during hydraulic fracturing. The Commission's response to induced events has varied with the causal mechanism. Eagle waterflood induced events were successfully mitigated when the operator reduced injection rates. For the two waste water disposal wells currently triggering events in northeast British Columbia, the Commission is working with operators to reduce injection rates and find alternative disposal zones and locations. Hydraulic fracturing induced events present a unique mitigation problem. Injection pressure is much greater than at disposal wells and flowback is not practical until the well is put on production. Responding immediately to hydraulic fracture induced events is limited to avoiding known active faults, altering hydraulic fracture parameters or suspending operations. From a regulatory perspective, lessons learned since 1985 would include the following: 1) Sufficient regional and localized seismograph monitoring must be in place to characterize the events 2) Effective event reporting and mitigation strategies should be formalized and implemented. 3) The seismic history for operational areas should be reviewed and the seismicity risk assessed 4) Procedures should be in place for the collection, sharing and release of seismological data 5) Research partnerships should be set up and supported to study the relationship between the operations and seismicity 6) Areas considered to be high risk for induced seismicity should be considered for exclusion from development.

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