

Seismic Risk Assessment

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Citation O&G Corporation
Speaker-State 43-36 #1
NESE 36-11S-51W
Kit Carson County
API: 061-06238

Seismic risk is thought to be low at this location.

The nearest seismic event to the Speaker-State 43-36 #1 recorded in the USGS Earthquake Database was a Richter Magnitude 2.8 event 30 miles to the southeast, about 8-3/4 miles east of Kit Carson Colorado. The event occurred July 6, 1989 at a depth of 5 kilometers below sea level. The depth translates to 21480 ft below the surface or about 4 miles.

Injection in the Speaker-State 43-36 #1 will be between 6626 and 6629 ft in the existing Speaker Oil Field.

The low risk assessment is made because:

There is no history of nearby seismic activity

Injection in the Morrow Formation will be above crystalline basement into an existing oil field. The well TD'd at 6775 ft MD. The last formation top picked was the Pennsylvanian Keyes Formation at 6646 ft MD. A section up to 200 ft thick of Cambrian-Mississippian rocks should lie between the TD of the well and crystalline basement.

The oilfield must have adequate seals in order to trap hydrocarbons so no fluids communicate with crystalline basement.

Map - Figure 1 of the DRAFT 2018 National Seismic Hazard Model places this part of Colorado on a boundary between areas with <4% and between 4% and 19% "Chance of slight (or greater) damage from an earthquake in 100 years". (Shaking equivalent to Modified Mercalli Intensity VI)

In the USGS Short-Term Induced Seismicity Model for 2018 the area has the lowest potential. "<1% Chance of potentially minor-damage ground shaking in 2018. (Shaking equivalent to Modified Mercalli Intensity VI defined as "Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.")