ABSTRACT
The combined application of multi-lateral horizontal drilling and multi-stage hydraulic fracturing has successfully unlocked unconventional tight hydrocarbon reservoirs. However, the field data show that only a fraction of the large water volume used in hydraulic fracturing treatments is recovered during flowback operations. The fate of non-recovered water and its impact on hydrocarbon production are poorly understood. This paper aims at understanding the relationship between water loss and rock petrophysical properties. It also investigates the correlation between water loss and soaking time (well shut-in time). Extensive spontaneous imbibition experiments are conducted on downhole samples from the shale members of the Horn River basin and from the Montney tight gas formation. These samples are characterized by measuring porosity, mineralogy and TOC. Further, a simple methodology is used to scale up the lab data for predicting water imbibition volume during the shut-in period after hydraulic fracturing operations.

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