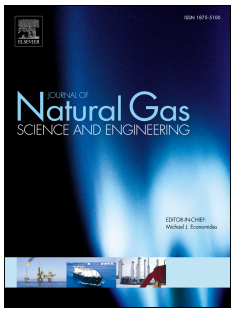
Accepted Manuscript



High injection rate stimulation for improving the fracture complexity in tight-oil sandstone reservoirs

Chuang Liu, Fang Shi, YongPing Zhang, YuGuang Zhang, DaWei Deng, XiaoLong Wang, He Liu, HengAn Wu

PII: S1875-5100(17)30113-0

DOI: 10.1016/j.jngse.2017.03.007

Reference: JNGSE 2105

To appear in: *Journal of Natural Gas Science and Engineering*

Received Date: 26 October 2016

Revised Date: 19 January 2017

Accepted Date: 3 March 2017

Please cite this article as: Liu, C., Shi, F., Zhang, Y., Zhang, Y., Deng, D., Wang, X., Liu, H., Wu, H., High injection rate stimulation for improving the fracture complexity in tight-oil sandstone reservoirs, *Journal of Natural Gas Science & Engineering* (2017), doi: 10.1016/j.jngse.2017.03.007.

High injection rate stimulation for improving the fracture complexity in tight-oil sandstone reservoirs

Chuang Liu[a], Fang Shi[a], YongPing Zhang[b], YuGuang Zhang[b], DaWei Deng[b], XiaoLong Wang[a], He Liu[c] and HengAn Wu[a,*]

[a] CAS Key Laboratory of Mechanical Behavior and Design of Materials, Department of Modern Mechanics, University of Science and Technology of China, Hefei, Anhui 230027 China

[b] PetroChina Daqing Oil Field Limited Company, Daqing, Heilongjiang 163454 China

[c] PetroChina Research Institute of Petroleum Exploration & Development, Beijing 100083 China

*Corresponding author, Tel/Fax: 0086-551-63601245, Email: wuha@ustc.edu.cn

Abstract: Successfully creating a large field fracture network is crucial for achieving economic production of tight-oil sandstone reservoirs. In this paper, the variations of in situ stress as well as the fracture network are studied based on a fully coupled flow and mechanics model. A high injection rate stimulation technique is extensively investigated as an effective method for improving the fracture complexity in single or multiple stages of horizontal well. Sensitivity studies are conducted for this stimulation method in improving the fracture complexity. The high injection rate stimulation cannot efficiently promote the fracture network area for ductile rocks. Initial in situ stress contrast plays an important role in the creation of fracture network. The fracture aperture as well as stress perturbation is controlled by the minimum in situ stress. The stress perturbation is accentuated in low permeability reservoirs, which is helpful to achieve a large field of fracture network. The area of new created