Reservoir Compartmentalization gas fields, the Netherlands - Discrepancy static vs. dynamic volumes

A study of Rotliegend gas fields in the Netherlands shows that connected volumes of 10-25% of the fields can be smaller than expected from volumetric evaluation (figure 6). Structural mapping can be an explanation for the discrepancy. However, seismic coverage in the Netherlands is generally good, with extensive 3D seismic coverage over large areas reducing this uncertainty. Therefore a geological explanation for the discrepancy has been investigated. Most gas fields are found in the Permian Rotliegend and good drainage is expected because the reservoirs are relatively thick and often homogeneous. Minor faulting (Typical normal faulting Fig. 7.) is not supposed to cause drainage problems. However infill drilling continues to find partly depleted or even virgin reservoirs. From detailed studies it is likely that fault sealing is the most important factor in explaining the discrepancy between static and dynamic volumes. This fault sealing is not likely to have been caused by clay smearing because of the depth of the Rotliegend. Core observations of a limited interval indicate that grain crushing (by late fault movements) can be a sealing mechanism for the sand to sand contacts of the Rotliegend.

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