

## Indications from Shale Cores of Stress and Stress Induced Failure

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Fine grained rocks, such as Shale (or Mudstones), often exhibit stress induced/related failures within the matrix which can be used as indicators of past or present stress conditions. Identifying stress induced failures in shale cores like petal-centerline or bedding-centerline fractures that are often associated with the current maximum stress orientation increases confidence in selecting a lateral well alignment which can maximize hydraulic fracture growth. Recognizing thrust derived shear failures in shale cores can alter drilling programs, targeting of laterals, and horizontal stress profiles which can directly impact hydraulic fracture growth. Stress changes during drilling/coring, for example due to running with too heavy or too light a mud-weight can alter the appearance of cored shales in such a way that these cores can give us clues about pore pressure, current stress conditions (Gravimetric versus Tectonic), sometimes strength or weakness of a unit, even indications of the relative matrix permeability of some shale intervals. Reading the clues from Shale Cores of Stress and Stress Induced Failures can dramatically impact drilling and completion success for any Shale play (oil or gas). The author will present observed stress related failures from cored shales, probable mechanisms, and some tested solutions.

### Common Stress Features in Shale Cores

