

In Situ Stress Determination and Related Wellbore Features from Image Logs of the Carnarvon Basin, Northwest Shelf

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Knowledge of the in situ stress field is vital to the petroleum industry for assessing trap integrity and maximising wellbore stability and recovery rates. The Carnarvon Basin Stress Map Project (CBSMP) aims to determine the regional in situ stress tensor of the offshore Carnarvon Basin as well as identify any local stress perturbations. Stress-related wellbore features such as borehole breakout and drilling-induced tensile fractures observed from image log data were used to define the in situ stress orientation. Previous work done in the Carnarvon Basin using poorer quality caliper data implied scattered maximum horizontal stress orientations with a mean orientation of approximately east-west. A total of 60 high resolution image logs have been interpreted to obtain stress and structural information for the CBSMP.

A regional maximum horizontal stress orientation of approximately 105°N was determined with the stress orientation being relatively consistent across the basin. However, some regions show some local stress perturbations where the maximum horizontal stress orientation rotates parallel to the structural grain in the region. Stress magnitudes derived from density logs and leak off test data yield a stress regime on the border of strike-slip and normal. The CBSMP has improved the density and quality of in situ stress data throughout the region. This poster illustrates the maximum horizontal stress orientation of the Carnarvon Basin and its variation over the basin. This poster will also illustrate structurally-related, stress-related and geological features on image logs from the area.