

Improving Seismic Interpretability by Integrating Well Seismic Data into Processing

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Construction of well-to-seismic ties and structural and stratigraphic mapping are the key tasks of an interpreter. In order to achieve the best results and see the most detail, great care must be taken during processing of the seismic data. Often, however, the standard processing flow is not sufficient to get good well ties and achieve the maximum resolution possible.

Valuable information from well seismic data (Vertical Seismic Profile – VSP) can be integrated into the processing flow, which is often not fully utilised. The application of the so-called Q factor to compensate for attenuation of seismic waves in the earth is very important. This can be directly based on VSP data, rather than a trial and error process, which is common practice. A Q factor of 100 is common to process the seismic data in Murphy Oil.

Through various examples in the Sarawak Basin, VSP-based time variant Q compensation function improves the interpretability of the seismic data by increasing the resolution and the continuity of events. This means that optimum Q application will provide the seismic interpreters with more data to be interpreted with higher confidence. Semblance between different stacks with various Q values applied and corresponding VSP corridor stacks was calculated to measure the similarity. Higher semblance was observed after applying time variant Q to the seismic data.

It was learned that a constant Q of 100 that have been used during earlier seismic processing would not be sufficient to compensate for both amplitude decay and time-variant phase shift.