

Microseismic and Horizontal Well Trajectory Imaging Methods for Improved Reservoir Development

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Microseismic data acquisition and processing methods are highly varied depending on the type of problem being addressed and the availability of observation wells of various depths. We will discuss the value obtained by use of one or more vertical observation wells with large vertical seismic receiver aperture. Ultimately the value derived from microseismic results is in the interpretation of the reservoir response to hydraulic stimulation. Examples of important reservoir development insights from microseismic data are shown. A second important application of borehole seismic methods for modern reservoir development is in use of rapidly acquired and processed 2D VSPs to guide the bit in horizontal wells. An example is shown in which a high resolution 2D VSP was acquired in the vertical section of a well before the bit was turned for horizontal drilling. Rapid turnaround of the high resolution 2D VSP image allowed the drillers to stay in zone for the entire length of the 5,000 ft horizontal leg and avoid expensive side tracks.