Maximizing oil production from lateral wells while avoiding collisions with existing wells necessitates accurate placement of directionally controlled wellbores. When wells are to be drilled in close proximity, gyroscopic surveys are often used to mitigate this collision risk. Although continuous gyro tool runs on wireline are considered very accurate, the frequency of the runs needed to obtain positional data during the drilling phase is costly.

While a Measurement-While-Drilling (MWD) tool will have a different ellipse of uncertainty than a Gyro-While-Drilling (GWD) or continuous gyro tool, all are subject to larger azimuth measurement errors when operating in east/west wells. A case study was undertaken employing MWD, continuous gyro, and all-attitude GWD systems across three horizontal wells being drilled in an easterly direction in order to achieve the client’s goals that were not obtainable with MWD alone.

Clear benefits were seen from using the all-attitude GWD system to control the placement of the extended reach section of horizontal east-west wells in real time. Gross errors in MWD data were also detected in real time, despite the system passing QC measures.

Continuous gyro run data consistently validated GWD results, and the accuracy of the all-attitude GWD system enabled the operator to drill safely through an additional 1000 feet of geological pay zone. This accurate wellbore placement in turn improved the overall project economics.