Claim 3 Responsibility for engineering activities

As a Petroleum and Reservoir Engineer for an oil producing asset, my task was to optimise and, if possible, increase oil production. This recently purchased asset comprised of a number of oil fields targeting over 5 different reservoirs. One field targeted two extensive shallow oil reservoirs. There were six wells drilled on the crest of the field of which there were 2 commercially successful, 2 sub-commercial and 2 failures. Using the current well design would not have been cost effective to develop the resource. The first step was to determine the oil in place estimate for this field which I referred to the geologist.

The geologist review confirmed a large resource spread out over a large area. The main geological risk was reservoir quality. Due to digenesis, larger porosity existed where the commercial areas occurred. This made predicting porosity trends difficult. The reservoir thickness was insufficient for seismic resolution.

The last development drilling programme occurred 5 years previously and due to the poor economic result, further development was suspended. Unable to predict reservoir quality, the target became a statistical play. To develop this field I needed to improve the project commerciality from 2 in 6 wells to 4 in 6 wells. The goal was to make the 2 sub-commercial wells commercial and this required a substantial reduction in drilling and completion costs.

Firstly, the well design was changed to barefoot completion construction. This was the least expensive completion but came with risk. The reservoir was not cased and therefore the wellbore was susceptible to collapse. Though the wellbore design was simple the implementation and design parameters were complex. Engagement of a drilling engineer and geophysicist was essential to ensure the stringent safety parameters were satisfied. The cost reduction was still insufficient and therefore an effort in securing equipment was required. Fortunately the previous owner had purchased surplus casing which we could use. These wells required artificial lift and I was able to secure beam pumps well below costs from another operator. The field staff efforts in recycling ancillary items such as fencing, signage and assistance in the installation could not be understated. To ensure community support, the field superintendent was able to engage the services of a pastoral manager and small local businesses to assist in the project. This proved to be very cost effective as mobilisation costs were minimised and the quality of work was excellent.

The final key requirement was the need to drill multiple wells. As this was a statistical play, at least 6 wells needed to be drilled. The project drivers were myself [Reservoir Engineer] and the geologist. The geologist was a driving force with respect to marketing this project internally. My job was to convince and satisfy the engineering management that safety parameters were met and to allocate development funds to the project. Management was able to appreciate the risks and understood the potential prize of this project.

As this was a statistical play, the results exceeded expectations. Subsequently, 14 additional wells were drilled on this field. The main point here is that by showing personal responsibility for the project, I was able to influence the outcome.