Appendix C.1 Kelkar Report

PayZone	Depth, ft	Permeability, md	
		Decalin	Xylene
1	18070	36	32
1	18072	8	7
1	18080	37	31
1	18082	13	12
1	18083	78	65
1	18085	112	98
1	18087	126	125
Average		59	53
2	18125	76	72
2	18132	30	23
2	18142	104	103
2	18148	181	160
2	18154	109	100
2	18158	118	112
2	18161	100	100
2	18163	75	70
2	18166	74	71
2	18174	61	53
2	18178	83	81
2	18183	62	56
Average		82	77

Table 1. Permeability Data From Different Pay Zones.

Saturation log (Figure 17) shows that pay zones 1 and 2 have different residual water saturations, 20% and 10% respectively. Therefore we have generated relative permeability curves using Corey's functions with exponents equal to 2.0 for both oil and water curves (Figure 18). Capillary pressures are assumed to be zero resulting in no transition zone which will place oil at residual saturation immediately above the contact.

Average rock compressibility of 5.61 E-6 is assumed at reference pressure of 11000 psia, from available data. Uncertainty around this rock compressibility is also considered in our simulations as explained in the next section.

Initially we defined 1 equilibrium region with a single water oil contact (WOC) at 18168 ft based on the information provided to us. However, our test simulation runs resulted in high water cut values up to 20% due to proximity of the well to the WOC (Figure 19). Figure 19 shows the impact of water production to the oil production rate from the well. Considering that the well did not produce water so far, we needed to move down WOC depth to 1250 ft to avoid water production. Assuming deeper contact than what is reported is also supported by the porosity and saturation logs. Figure 16 shows presence of a thin oil interval with porosity reading of ~20.5% and Sw of 28% between 18200'-18250' interval.

Simulation runs are conducted using PVT and VFP tables previously discussed considering the following uncertainties.