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D. K. Larue[1], F. Jian[1], H. Legarre[1], J. Toldi[1], A. Chawathe[1], Y. Yue[2] (1) ChevronTexaco Exploration and Production Technology Company, San Ramon, CA (2) Stanford University,

**On Stratigraphic Architecture and Recovery by Waterflooding**

Five years ago, a research project was started to address how stratigraphic architecture affects recovery in oil fields produced by waterflooding. The goal was to make predictive curves, or define envelopes of recovery, for different depositional environments, and different types of channelized environments. Detailed conceptual (>1000), outcrop ( ~ 30) and field models ( ~ 50) were constructed. Waterflood simulations were performed on each model, and recovery efficiencies were compared as a function of a number of geologic and engineering parameters. Results of simulations showed a spread in recovery efficiency of about 60% for these studies. No simple relationship was observed between stratigraphic architecture and recovery. Models that appear to be very different based on visual inspection may behave very similarly during waterflood simulation. Stratigraphic factors found to affect recovery are: 1) reservoir volume (OOIP); 2) well efficiency (placing the wells in an optimal stratigraphic location); 3) connectivity of the reservoir to the wells; 4) permeability heterogeneity; 5) tortuosity of the reservoir path to the wells. From an engineering standpoint, these characteristics would be described under ''volumetric sweep efficiency.'' Uncertainty in reservoir volumes has a large affect in development studies. Uncertainty about reservoir volumes may impact reserves more than percent recovery (which is normalized to volume). Well efficiency ensures that there are enough wells, and they are placed and oriented to minimize unswept and by-passed zones. Reservoir connectivity, expressed as the percent of the reservoir connected to wells, has large potential for impact, but most reservoirs with sandstone volume >50% do not suffer from connectivity problems unless they are ''two-dimensional'' or there are volume support issues. Permeability heterogeneity can account for differences of 10% or more in recovery. Reservoir tortuosity is a potentially important but poorly understood reservoir property, correlated with continuity length of impermeable bodies. A number of programs have been developed to characterize these five factors.