

# Case Study



## CDG Technology in China

### Successful Field Pilot of In-Depth Colloidal Dispersion Gel (CDG) Technology in Daqing Oil Field (SPE 89460)

#### Situation

Based on encouraging results from laboratory studies described in SPE 62610(1), a first large-scale CDG pilot test was started in the largest oil field in China, Daqing Oilfield, in May 1999. The pilot test was conducted in an area of 0.75 Km<sup>2</sup>, a double five-spot well pattern of 6 injection wells and 12 producers. The well spacing is approximately 250 meters.

#### Program

Up to June 2003, three chemical slugs; 0.179 pore volume (PV) of CDG slug I, followed by 0.155 PV 600 mg/l of polymer solution, and then 0.196 PV of CDG slug II. The drive water has been injected since June 2003

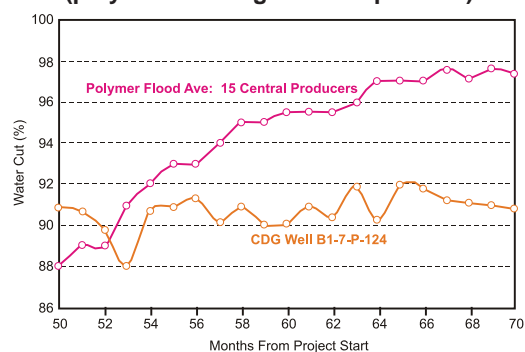
#### Results

The pilot test indicates that with CDG injection, the reservoir permeability between injectors and producers has been adjusted and volumetric sweep improved. The water cut was reduced by 19.8%, the incremental oil production was up to 24 tons per day in the central production well B1-7-P124 during the peak production period.

The pilot test results, to date, demonstrate that CDG technology:

1. Can be used before, during, or after a polymer flood to effectively control the water production and maintain the high oil rate.
2. Has higher incremental oil recovery with better economics than the straight polymer flooding
3. Has wide application in heterogeneous reservoirs for improving water flood efficiency and oil recovery,
4. Can reduce producing water treatment costs as compare with polymer flooding due to lower polymer production in producing wells.

Comparison of watercut in post-flooding (polymer flooding vs. CDG process).



Comparison of Chemical Costs for Polymer Flood, CDG, and ASP Processes	CDG	PF	ASP			
			Pre-flood	ASP Slug 1	ASP Slug 2	Polymer Drive
Slug Size	0.50	0.50	0.04	0.35	0.10	0.20
Recovery Efficiency (%OOIP)	12	10	20	--	--	--
Chemical Slug Costs (US\$/BBL)	0.38	0.36	0.51	3.58	1.84	0.51
Chemical Costs / BBL Incremental Recovery (US\$)	2.25	2.58	11.12	--	--	--