Abstract

The Codell Sandstone has been producing gas and oil in the Colorado/Wyoming DJ Basin since 1979. Due to relatively good porosity but low permeability Codell production has historically been restricted to the Wattenberg Field where thermal maturity of the Codell is in the gas window. Recent advances in horizontal drilling and multi-stage fracture stimulations have extended the play outside of Wattenberg Field into the northern DJ Basin. Stabilized production rates up to 1300 BOPD are associated with recently completed horizontal Codell wells. This new play area in Laramie County, Wyoming and northern Weld County, Colorado is thermally in the oil window with gas-oil ratios less than 2000 scf/bbl.

Two Codell cores from Laramie County, WY, provide examples of the two depositional facies. The Noble Berry UN #13-09 core recovered 28.5 feet of Codell Sandstone, including 27 feet of bioturbated facies and 1.5 feet of laminated facies. The Cirque Laguna #8-8-2CH core recovered 20 feet of Codell Sandstone, including 13 feet of bioturbated facies and 7 feet of laminated facies. Core oil saturations and fluorescence under UV light indicate that the Codell Sandstone is oil saturated in both cores. Nearby horizontal wells drilled and completed in the Codell Sandstone indicate that oil can be recovered economically, extending Codell production more than 50 miles north of Wattenberg Field.
Codell Sandstone, Northern DJ Basin, Wyoming and Colorado: Reservoir Characteristics in a Tight Oil Play
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Fine grained sand with interspersed clay. Poorly sorted angular sand grains with intergranular clay.

Codell Sandstone, Northern DJ Basin, Wyoming and Colorado: Oil window with gas-oil ratio less than 2000 scf/bbl.

Moonstone bioturbated sandstone has 8 to 13 percent porosity and 0.008 to 0.05 millidarcies permeability.

Bioturbated low formation resistivity. The Codell thins from north to south due to erosional truncation.

Apatite Quartz ~ 60-70% Feldspars ~ 10-20% Clay ~ 20% Pyrite Varies