

Hall and Link, 1990

Data Set 29

Reference: Hall, B.R. and M.H. Link, 1990, Reservoir description of a Miocene turbidite sandstone, Midway-Sunset Field, California: in Sandstone Petroleum Reservoirs, J.H. Barwis, J.G. McPherson, and J.R.J. Studlick, eds, Springer-Verlag, p. 509-533.

Author's affiliation: Mobil

Age: Late Miocene

Formation: Webster Zone of Monterey Formation

Location: Midway-Sunset Field, Southern San Joaquin Basin, Kern County, California, United States

Well: Well 239-D and Well 327

Depth range: approximately 1,000 - 1,800 feet below surface.

Depositional environment: "The Webster reservoirs are interpreted as turbidites deposited in a relatively narrow basin that was close to a tectonically active source. These turbidites are interbedded with organic-rich shale and mudstone of the Monterey Formation, which served as both source and seal for oil in the turbidite reservoirs. The lithofacies variations are interpreted to represent a change from depositional lobes in the lower Webster Main to predominantly channel-fill deposits in the upper Webster Intermediate. A channel/lobe transition zone occurs between these two facies."

Lithology: "The Webster Zone is composed of poorly consolidated feldspathic (arkosic) sandstone, with grain-supported fabric. In intervals of high reservoir quality, the principal "cement" is oil, which acts as a binder due to its high viscosity. In some of the poorer quality reservoir intervals, the volume of clay matrix is high and acts as a weak cement. Minor compaction textures such as deformation of micas and fracturing of feldspars are evident. Grains are angular to subangular and sorting is poor. In the better reservoir intervals, macropores are interconnected, whereas in poorer zones, as the proportion of clay matrix increases, porosity and permeability decrease. Petrographic and X-ray diffraction studies show that the Webster Zone sandstone contains from 30 to 50% feldspar, 20 to 40% quartz, and less than 5% other minor detrital components, including micas, rock fragments, detrital clays, and heavy minerals. This mineralogy is indicative of a plutonic sediment source. Detrital opaline (silica) material in the form of diatom fragments in the opal A grade is a minor constituent."

Grain Size: very coarse in channel fill deposits, coarse to medium in channel/lobe transition deposits, medium in depositional lobe deposits. (Table 21-1).

Alteration: "Authigenic minerals include dolomite, microquartz, heulandite, calcite, pyrite, hematite, and smectite. Typically these minerals comprise less than 5% of the sample with the exception of the occurrence of dolomite as spheroidal nodules in a few intervals. Illite/mica is the dominant detrital clay in the less than 5 micron size fraction. The main authigenic clay is smectite, and the total clay content is in the range of 2 to 5%. The interbedded mudstones and siltstones are compositionally similar to the sandstones except for higher proportions of clay and opaline silica (opal A)." Zero percent secondary porosity.

Production: heavy oil, 14 degree API

Core measurement conditions: not given, presumed to be conventional. Plug samples taken at one foot spacing. Plugs were unstressed during measurement.

Data entry: manual entry from Figure 21-17 of the referenced paper. "Each point is a mean value for individual sand bodies. A total of 930 data points from the two well cores were used in the analysis."