

3.8 King #1, Core plug 17, depth 1426.70m

Thin section description

The sample is a poorly sorted, very fine grained, mineralogically mature and texturally immature quartzarenite. Bedding is defined by the concentration of coarser sand in weakly defined layers and alignment of elongate grains. Grain size is bimodal where the coarser sand is present and sorting is moderate in the intervening beds. Coarser sand is typically subrounded to rounded with moderate sphericity and ranges in diameter from 0.27mm (medium sand) to 2.0mm (granules). The fine fraction varies in diameter from 0.05mm (coarse silt) to 0.20mm (fine sand) and commonly is subangular with low to moderate sphericity. Texturally the sample is grain supported with point contacts dominant. There is no evidence of significant mechanical compaction.

Porosity is excellent throughout the sample (Fig. 9) and consists of primary intergranular pores with minor secondary pores. The latter have resulted from the partial dissolution of labile grains including feldspars. Permeability is probably good due to the dominance of primary pores.

Framework grains of quartz, feldspar, lithics, mica, opaques, epidote, tourmaline, sphene and zircon are evident. Traces of reddish clay that form isolated patches could be the result of infiltration by drilling mud. Rare pores are filled with opaque material that is probably organic matter. There is a distinct lack of authigenic minerals and cements in this sample. The only evidence of diagenetic alteration are traces of carbonate spar and kaolin.

Visual Estimate of Composition		%
Framework grains	Quartz	64
	Feldspar	1
	Lithics	tr
	Mica	tr
	Accessory minerals	1
Matrix	Clay	tr
	Opaque material	3
Authigenic minerals and cements	Carbonate	tr
	Kaolin	tr
Porosity	Intergranular	25
	Dissolution	5

X-ray diffraction

XRD of the clay fraction (Fig. 10) indicates the relative lack of clay in this sample. Minor kaolinite and traces of illite-2M1 were the only clay minerals detected. The illite has probably been derived from the micas present and the kaolin has been derived from the alteration of feldspars. The only other mineral identified in the clay fraction was quartz.