

### 3.2 King #1, Core plug 5, depth 1399.40m

#### Thin section description

This siltstone is a laminated, cross bedded, moderately sorted coarse silt. Laminae are outlined by differences in the concentration of matrix, accessory minerals and micritic carbonate. Grains range in diameter from 0.01mm (medium silt) to 0.09mm (very fine sand) and are commonly angular with low sphericity. Grain size is slightly finer than the previous sample (1398.60m). Texturally the siltstone is grain supported with dominantly tangential and minor point contacts between grains. There is minor evidence of mechanical compaction due to the crenulated nature of opaque stringers.

Porosity is confined to those laminae that only contain traces of matrix and cement (Fig. 2). Primary intergranular pores occur in these laminae and there are rare dissolution pores apparent. Fractures parallel to bedding also concentrate in the porous laminae. Vertical permeability is likely to be limited by the alternating nature of porous and impermeable laminae.

Framework grains of quartz, feldspar, mica, pale yellow glaucony, sphene, zircon, epidote and opaques are evident. Matrix is comprised of anhedral pale brown clay and minor opaque material (?organic matter). Authigenic minerals and cements of patchy micritic and sparry carbonate, pyrite cubes and rare quartz overgrowths are evident.

Visual Estimate of Composition		%
Framework grains	Quartz	51
	Feldspar	tr
	Mica	2
	Glaucony	tr
	Accessory minerals	1
Matrix	Clay	8
	Opaque material	3
Authigenic minerals and cements	Quartz	1
	Carbonate	10
	Pyrite	tr
Porosity	Intergranular	20
	Dissolution	tr
	Fractures	3

#### X-ray diffraction

The dominant clay mineral detected (Fig. 3) is kaolinite, which is probably the major component of the matrix. Minor illite and possible traces of clinocllore were also recognised. Flakes of illite have probably been derived from the mica evident in thin section and the chlorite could represent altered micas.