Brief petrographic description of volcaniclastic sandstone from the Queensberry Mine area

Hand specimen:

Green-grey, fine-medium grained, poorly sorted, magnetic, feldspar-quartz-ferromagnesian mineral(?)-magnetite crystal-rich volcaniclastic sandstone, with common granule- to pebble-size, variably (silica-albite?) altered ?felsic volcanic lithic clasts.

Thin section:

Very poorly sorted crystal-lithic volcaniclastic sandstone, with clasts 0.05mm to 20mm in size.

20-30 vol.%, 2-5mm and one 20mm, angular, strongly porphyritic **andesite lithic clasts**. These have ~25vol.% phenocrysts, mostly 1-2mm plagioclase, minor 1-2mm altered clinopyroxene (commonly in clusters) and minor 0.2mm opaques. The phenocrysts include a minor component of ~0.2mm plagioclase microphenocrysts. The groundmass of the large clast is a fine grained qtz/felds assemblage, which was probably originally glassy. Most of the smaller lithic clasts are chloritic and were probably originally vesicular, as they have shadowy bubble-wall shapes.

25-30 vol.%, 0.2-2.5mm (most ~1.5mm), subangular-angular **plagioclase** crystals, large clusters and fragments, all variably altered to fine sericite.

5-10 vol.%, 0.1-1.5mm (most ~1mm), subangular-irregular round/embayed **quartz** crystals and angular fragments.

2-5 vol.%, 1-3mm, ragged chloritic blebs, probably after some originally glassy component (e.g. aphyric pumice?).

1-2 vol.%, 0.1-1mm (most ~0.25mm), variably chloritised (+/- epidote?) **clinopyroxene** crystals.

1-2 vol.%, 0.2-1.2mm (most ~0.4mm), angular **opaques**, probably magnetite.

Matrix - 30-40 vol.%, altered to a fine grained quartz-albite-chlorite assemblage, which is hard to distinguish from the altered lithic clasts. Possible less altered parts of the matrix have shadowy, bubble-wall shard-like shapes (~0.1mm) but these could also be relict textures of altered vesicular clasts.

This rock is very similar to samples from units in the nearby western Henty Fault Wedge and lower Yolande River area, but has somewhat less clinopyroxene and significantly more quartz. It is essentially monomictic and the common ragged, vesicular clasts, poor sorting and large angular crystal and crystal fragment component suggests it is a syn-eruptive unit, probably related to (?intrabasinal) explosive andesitic volcanism. The similar units elsewhere have distinctive clinopyroxene chemistry, which groups them with the Lynchford Member CRVS.

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