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The proposed main focus of this study is the Upper Rhyolitic Sequence, which represents a distinctive package of volcanics, volcanoclastics and associated sediments in the Hellyer Mine area geology. It represents a distinct change in both composition and eruptive mechanism to that found in the footwall and immediate hanging wall, which is basaltic, andesitic and dacitic in composition. The upper hanging wall is marked by more acidic volcanism, including horizons of pumice debris, and some apparent eutaxitic texture.

Previous work (MacArthur, 1986), and work in progress, (Waters, Ph.D study, Monash) suggests that the footwall to immediate hanging wall has variably altered coherent to brecciated and quenched lavas, intrusives and associated resedimented volcanoclastics of similar composition. Apart from vesicular debris in the Hanging Wall Volcanoclastic Sequence, there is little or no evidence of pyroclastic activity (J. Waters, *pers. comm.*) and this material may represent quenched vesiculated lava, not pyroclastic debris. The associated sedimentary succession is consistent with a relatively deep, quiet water environment, as is indicated by the black, anoxic shales of the overlying Que River Shale.

The pumiceous debris units in the Upper Rhyolitic Sequence represent pyroclastic activity, but the depositional setting and source of this material is unclear. Previous work by Scott (1987) has suggested a change in the environment and in the *in situ* style of volcanism to an explosive plinian style from the "Hellyer Volcanic Centre", but, this has not been shown from the sedimentology of the associated sediments, nor from the volcanics and volcanoclastics themselves.

The main objectives of this study are to investigate the eruptive and post eruptive depositional history the volcanic and volcanoclastic units within the Upper Rhyolitic Sequence, and to examine the sedimentology of the sequence as whole, taking particular note of the effect of volcanism on sedimentation patterns. An examination of the Que River Shale is also proposed, to document the differences (if any) between these shales and the shales found within the Upper Rhyolitic Sequence.

2. Work Completed

2.1. Field Work

A preliminary excursion to the mine area was made over two weeks in October 1989. This time was spent evaluating resources and identifying areas of specific interest. Drill core of the Upper Rhyolitic Sequence from three holes was examined and sampled. Selection of these holes, based on advice from mine and exploration staff, was such that the lateral continuity of units between two closely spaced holes (HL40 and HL62) might be examined, and that the large scale lateral and vertical variation between these holes and a more distant example of the sequence might be examined (e.g. HL62 compared against Mac 22).