

this high strain into the anticlinal closure at Que River Mine. This zone is then truncated by the Que River Fault.

Structure of the Hellyer Anticline is not consistent with any kind of folding. The most likely process to produce the localised, asymmetric deformation is basement controlled deformation. Such a situation may occur where the bounding faults related to basin formation have been reactivated in reverse movement and produced irregular folding in the sediments immediately overlying the area of shortening (illustrated in Figure 7). This process is assumed to have followed a period of broad, regular folding during the initial shortening. Once the basement faults are reactivated it is assumed they accommodate virtually all the remaining strain through reverse movement in the basement and irregular folding in the overlying cover. With high strain the cover folds may become detached through shearing and faulting along the fold axis or limbs. Geometry of the cover folds may vary along strike due to variations in the basement fault pattern and the degree of reverse movement varying along the fault, which may be related to variation in strike.

It is possible for both reverse and normal faults to occur in the cover deformation during shortening. Reverse faults will probably be steep and close to the orientation of the fold axis. In many cases these faults will run close to the axis of anticlinal closure and may shear out one limb of the fold, usually the steep or overturned limb. Normal displacement may occur due to the localised nature of the shortening producing over-thickening which will spread by extensional failure. These are expected to form perpendicular to the fold axes and post-date the main shortening structures. Normal displacement might also occur parallel to related fold axes and reverse faults due to the special conditions of basement controlled faulting, as illustrated in Figure 5. This form of faulting is peculiar to inversion of basement faults and may be indicative of their position and style. Faulting along the east margin of the Hellyer Anticline could be related to a form of inversion normal fault, based upon the observed nature of displacement across the structure.