
**Kemptonville Shear Zone; regional shearing,
mineralization and granite emplacement?**

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The Kemptonville Shear Zone (KSZ) is a regional-scale structure developed within the metasandstone dominated Goldenville Formation. This shear zone is several hundred metres wide, has a defined strike length of 10 kilometres and an inferred strike length of 25 kilometres; extrapolation of the eastern half of the KSZ is assisted by aeromagnetic data. In the field the KSZ is characterized by a shallow, northwest-dipping, foliation. This foliation is characterized by significant and variable shear, a lack of evidence of pressure solution, and is interpreted as an extensional shear band-like fabric that deforms an associated steep, northwest-dipping, mylonitic fabric. Shear band geometry indicates north-side-up, dip-slip displacement along the KSZ.

Several mineral occurrences occur within the KSZ, including the Kempt Back Lake gold district. Variably deformed quartz veining and local intense sericitic alteration with associated sulphide mineralization demonstrate significant hydrothermal fluid flow during shear zone development.

The KSZ parallels the linear northeast-trending contact of the South Mountain Batholith (SMB). Evidence of shearing

and the linear distribution of intrusions along this contact suggest syn-to post-intrusive faulting (referred to as the East Kemptville shear zone). The region between the KSZ and the SMB is characterized by anomalous granophile mineralization, often occurring within locally defined shear zones, elevated radiometric values and low gravity data, all of which are consistent with the presence of an intrusion at shallow depths. That the KZS defines the north boundary of this region leads to the interpretation that at depth it represents the granite-metasediment boundary. A syn-intrusive age for shearing, similar to along the East Kemptville shear zone and other mineralized shear zones, would explain the variably deformed veins and alteration.