CONCLUSIONS

Conclusions, largely of genetic nature, concerning the petrology and structure of the Tuzo Creek Molybdenite Prospect are listed below:

1) Granodiorite, quartz monzonite and porphries are all part of a single differentiation series.

2) Phenocrysts in porphyries and probably those in quartz monzonite have crystallized at depths of approximately 11 km's or more.

3) The quartz monzonite stock and porphyries were successively emplaced from great depths (ie. at least 11 km's) into a sub-volcanic environment.

4) Both local and regional structures were regenerated successively in type and orientation. Local structures include

(a) two periods of development of gently-dipping fissures due to subsidence of the stock and

(b) two periods (I and II) of fracturing, genetically related to wrenching shear movements due to termination or pinching-out of regional reverse rotational shearing.

Regional structures include

(a) two periods (I and II) of shearing and a late period (III) of faulting and

(b) two periods of development of tensional fissures.

5) Regional structures can be interpreted through application of a combined stress and strain ellipsoid diagram.

they were caused by successive and intermittent periods of compression and tension whose respective forces must have been resolved from successive periods of development of rotational forces generated by right lateral strike-slip movements along the West Kettle River fault zone.

6) Phase-I and -II hydrothermal activity were controlled, respectively by Periods-I and -II structures and followed emplacement of pre- and intra-mineral porphyry, respectively. Gross paragenesis of deposited gangue, sulphide and oxide minerals is in line with other hydrothermal environments.

7) Phase-I hydrothermal activity was the most important since it developed a large, zoned alteration halo and had associated significant molybdenite mineralization. Wallrock alteration, quartz veining and mineralization are related paragenetically to a single, probably prolonged phase of hydrothermal activity. Hydrothermal fluids must have ascended upwards along the "foliated shear zone" and spread outwards and upwards from its upper part mainly along fractures. Control of wallrock alteration mineral assemblages was undoubtedly both chemical and physical, though physical control is believed to have been the most important since steep temperature gradients best explain the sharp boundary between the potash feldspar and hydromica regions in view of experimental studies in hydrothermal systems by Hemley, and others. "Oxide" and "sulphide" fields of mineralization, due to differences in O/S fugacity ratio in the hydrothermal fluid were brought about by an increasing O/S fugacity ratio laterally about the stem of the "sulphide field". Molybdenum in transport in the hydrothermal

fluid was associated preferentially either with S-rich complex ions or simply with fluids of lower O/S fugacity ratio. Deposition of molybdenite was associated preferentially with regions of most intense K+ ion or K+ and H+ ion metasomatism.

8) Source rocks of Phase-I and -II hydrothermal fluids were undoubtedly pre- and intra-mineral porphyry, respectively. Fluids were released from porphyries as a result of Period-I and -II deformation. Phase-I fluids must have been released largely from a buried stock of pre-mineral porphyry.

9) Geological characteristics of the prospect are reflective of major producers of molybdenum ore. Considerable economic potential for molybdenum ore still remains within the "molybdenite zone".