



**KUTCHO CREEK MAP—AREA  
(1041/1W)**

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Geological investigations in the Kutcho Creek area begun in 1974 (GEM, 1974, pp. 343-348) proceeded in 1975 (Geological Fieldwork, 1975, pp. 86-92; Geology in British Columbia, 1975, in press), and continued in 1976. Work advanced in three main directions:

- (1) Mapping was extended to the west of Kutcho Creek where volcanic and sedimentary rocks similar to those hosting the known sulphide deposits are now known to occur.
- (2) Structure in the vicinity of the main mineralized zone was studied in detail and earlier interpretations were refined.
- (3) A substantial amount of diamond-drill core and a number of critical outcrops were examined in detail in order to obtain a better understanding of lithology in the mineralized part of the stratigraphic succession.

The approximate extent of the volcanic map unit in which the sulphide deposits occur was determined from east of Tucho River to west of Kutcho Creek. The north and northwest boundary is a fault contact with rocks of the Cache Creek Group; to the east, quartz monzonite intrusions occur; and on the south are greenstones and phyllites of possible Triassic age. The favourable volcanic unit continues to the west and west-southwest of Kutcho Creek for at least 15 kilometres and probably for a considerably greater distance.

Volcanic rocks are locally overlain by conglomerate, a more or less continuous limestone unit commonly a few tens of metres in thickness, and a thick sequence of shale and sandstone (Fig. 17).

The structural style described in 1975 held up to closer scrutiny. The major structure mapped is an east-west-trending anticlinorium, the northern limb of which contains a number of smaller folds.

The presence of a folded unconformity can be demonstrated. Volcanic rocks are Early Permian ( $275 \pm 15$  m.y.) as determined from a Rb-Sr isochron date provided by Dr. R. L. Armstrong of the University of British Columbia. The volcanic rocks are, therefore, temporal equivalents of the Cache Creek Group but are more closely correlative on a lithologic basis with the Asitka Group.

The overlying sedimentary sequence consists of a thick lens of polymictic conglomerate, a persistent limestone unit and a thick succession of shale, siltstone, and sandstone. A

sparse fauna collected from two localities in the limestone includes pelecypods, gastropods, and Schleractinian corals, the latter indicating a Middle Triassic or younger age (the identification was provided by Drs. J.W.H. Monger and E. W. Bamber of the Geological Survey of Canada). We now regard the limestone unit to be part of the Sinwa Formation (late Upper Triassic) as described by Souther (*Geol. Surv., Canada, Mem. 362, pp. 22, 23*).

The coarse quartz-eye-bearing feldspathic chlorite schists referred to in 1975 as 'grits' (Geological Fieldwork, 1975, p. 88; Geology in British Columbia, 1975, in press) were re-examined. Their origin still remains an enigma. The lack of grading and sorting rules out a detrital or clastic origin and the rocks are now interpreted to be, at least in part, subaqueous ash flows. On the basis of chemical composition, mineralogy, and grain size we believe they are genetically related to the coarse-grained trondhjemites that are exposed along the southern part of the map-area. Some homogeneous, evenly textured quartz-eye feldspar crystal schists may be porphyries that were emplaced as dykes or sills.

Work is continuing in order to provide detailed descriptions of mineralogy and chemical composition of volcanic rocks and to yield a better understanding of the origin and depositional environment of major stratigraphic units.

A number of replicate stream and groundwater samples were collected and analyses determined that waters in the Kutcho Creek area are generally pure and of high quality although a number of samples were markedly anomalous in copper, zinc, iron, and sulphate. The samples serve as a base for further environmental and water quality studies.