



**STRATIGRAPHY AND COPPER MINERALIZATION
OF THE NICOLA GROUP, FAIRWEATHER HILLS
(92H/15E)**

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This project was sponsored by the British Columbia Department of Mines and Petroleum Resources and carried out as partial fulfillment of the requirements for a Master's degree at Queen's University, Kingston, Ontario. It is a re-mapping in greater detail (1 inch equals 500 feet) of the Fairweather Hills area which was shown by Christopher (1973) to be an unusually well-exposed volcanic centre and which was known to contain numerous copper prospects. The scope of the project was to study in greater detail the volcanic stratigraphy of the area particularly in its relation to the distribution and type of copper occurrences.

The rocks of the area were subdivided into 16 units, but have been grouped into five major divisions on the following generalized preliminary map (Fig. 2). Previous work by Christopher (1973) and Preto (1974) does not seriously disagree with the general pattern indicated.

The red volcanic breccias in the Fairweather Hills area are all augite lahars that have the following characteristics:

- (1) heterolithologic and polymictic fragments
- (2) intercalated volcanic flows
- (3) thin lenses of red sandstone with graded bedding
- (4) a chaotic, intimate mixture of all fragment sizes

The red colour is believed to have resulted from oxidation in a subaerial environment.

The green breccias are mainly laharic with some intercalated green autobreccias. They were probably deposited in a submarine (reducing) environment, so they have a green colour, are generally magnetic, and display no thin lenses of reworked matrix material.

Christopher (1973) divided the augite andesite porphyry into two units on textural grounds. In fact, the red autobrecciated flows and massive green flows are generally intercalated on a random basis and are the same composition. These two units were combined.

The Fairweather Hills area can be divided into three assemblages according to their lithology and spatial relationships. If a correlation can be made with Schau's divisions of the Nicola Group near Nicola Lake (1968), it might be as shown following.

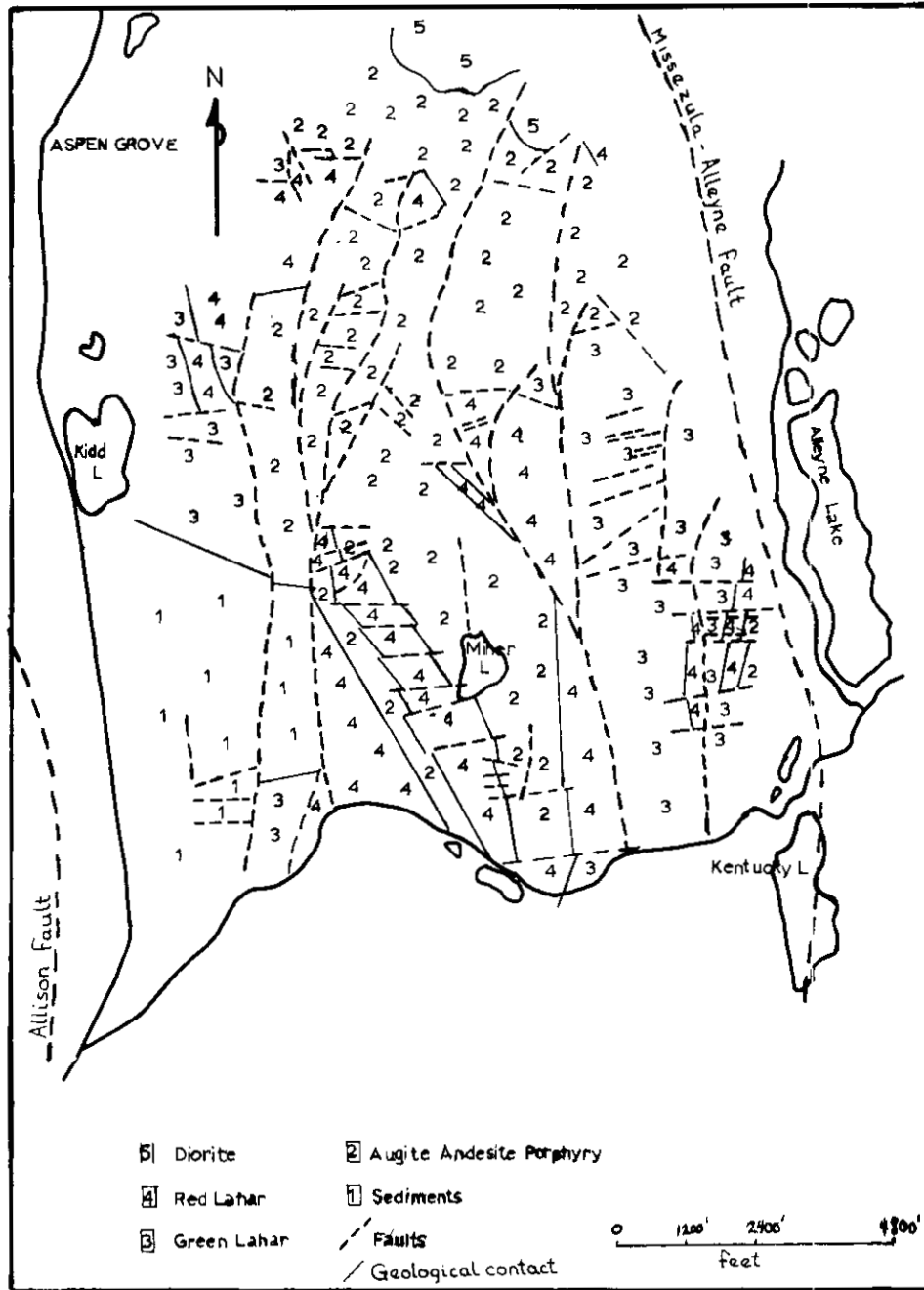


Figure 2. Generalized geology, Fairweather Hills area.

Nicola Lake <i>(Schau, 1968)</i>		Fairweather Hills <i>(This Report)</i>	
A ₂	sediments, tuff, minor limestone	3	green augite lahar, sandstone, red augite lahar, augite andesite porphyry
A ₁	basalt flows, associated pyroclastic and epiclastic sediments	2	augite andesite porphyry, red augite lahar, dacite, augite plagioclase andesite porphyry
P ₂	andesites, andesitic basalt and rare dacite, and abundant pyroclastics and sediments including limestone	1	sandstone, siltstone, conglomerate, green lahar, red lahar
P ₁	basaltic andesite and associated pyroclastic and epiclastic sediments		

The units generally strike to the north-northwest and dip to the east. The area is dominated by north-trending gravity faults similar to the two regional faults, the Allison fault and the Missezula-Alleyne fault, that are the boundaries of the map-area. Characteristically, these faults are splayed. A second group of much more numerous, possibly rotational, transverse faults occur commonly in series.

As there has been no significant folding, only tilting of the fault blocks, it is believed that the oldest rocks are to the west and the youngest to the east in the map-area. Recent evidence (Preto, 1974) indicates the Nicola Group may span the Upper Triassic to Lower Jurassic periods.

Copper mineralization is ubiquitous in the augite andesite porphyry and present in some lahars and limestones. Notably, the lahars on the west side of the map-area are barren. Additions to Christopher's (1973) list of copper occurrences are:

- (1) Chalcocite and malachite are found on fractures in the country rocks adjacent to gabbro dykes such as some showings southwest of the Big Kid prospect.
- (2) Not only contacts between red and green lahars, but all contacts between lahars in copper-rich areas appear to be favourable areas for mineralization.

REFERENCES

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