



British Columbia Geological Survey Geological Fieldwork 1977

CENTRAL BRITISH COLUMBIA

GRANITE MOUNTAIN PROJECT (93B/8)

By A. Panteleyev

A mapping project of the Granite Mountain pluton, host for Gibraltar mine, was undertaken during 1977. Major objectives of the mapping project were to define the size and boundaries of the pluton, to describe the enclosing rocks and their contact relations with the pluton, to determine if any subdivision of the pluton into distinct rock types or phases was practical, and to define the size of the adjoining Sheridan Creek stock and its relationship to the Granite Mountain pluton.

Bedrock mapping was done at a scale of 1:15 840 (1 inch = ¼ mile) over an area of approximately 390 square kilometres (150 square miles). Two hundred and sixty-five rock samples were collected, providing a sample density of at least one sample per square kilometre over 60 per cent of the map-area. Some samples will be chemically analysed to determine the rock compositions and a large number will be analysed to define minor element trends (Cu, Mo, S, Pb, Zn, Mn, Ag, and possibly others) within the Granite Mountain pluton.

Preliminary results of mapping are shown on Figure 8. Granite Mountain pluton is 127 square kilometres (49 square miles) in size and therefore is a valid, albeit small, batholith. The younger Sheridan Creek stock is 35 square kilometres (15 square miles) in size and appears to be mainly in fault contact with Granite Mountain batholith. Another small stock is present along the northeast contact of Granite Mountain batholith near Burgess Creek.

Based on hand specimen identification, three phases are recognized in Granite Mountain batholith: diorite in the south, quartz diorite in the mineralized central part, and leucocratic quartz diorite in the northern half. Boundaries between the three main rock types shown on Figure 8 are approximate and will be refined when petrologic data are available. Dykes are rare and, where present, are generally less than 5 metres in width. Sheridan Creek and Burgess Creek stocks are quartz diorite to granodiorite in composition.

All three phases of Granite Mountain batholith are medium to locally coarse-grained porphyritic rocks which are foliated to some degree. Zones of strongest foliation trend east-westerly (azimuth 100–280 degrees) and commonly have gentle southward dips. In the most intensely foliated zones granitic textures are obliterated and the rocks are quartz-bearing chlorite schists and chloritic sericite schists. Such schistose rocks are common in narrow sinuous zones within a broad band of strongly to moderately foliated rocks that envelopes the mine area and follows the quartz diorite-leucocratic quartz diorite boundary. A second area in which schistose rocks are common is along the southwest contact where greenstone (greenschist) is wedged between Granite Mountain batholith and Sheridan Creek stock.

Country rocks in contact with Granite Mountain batholith in the south are Cache Creek phyllitic siltstone, greenstone, and rare limestone. In the north the batholith has intruded andesite flows, breccia, greywacke, siltstone, and conglomerate. Within this assemblage there is some sandstone composed of mainly quartz and

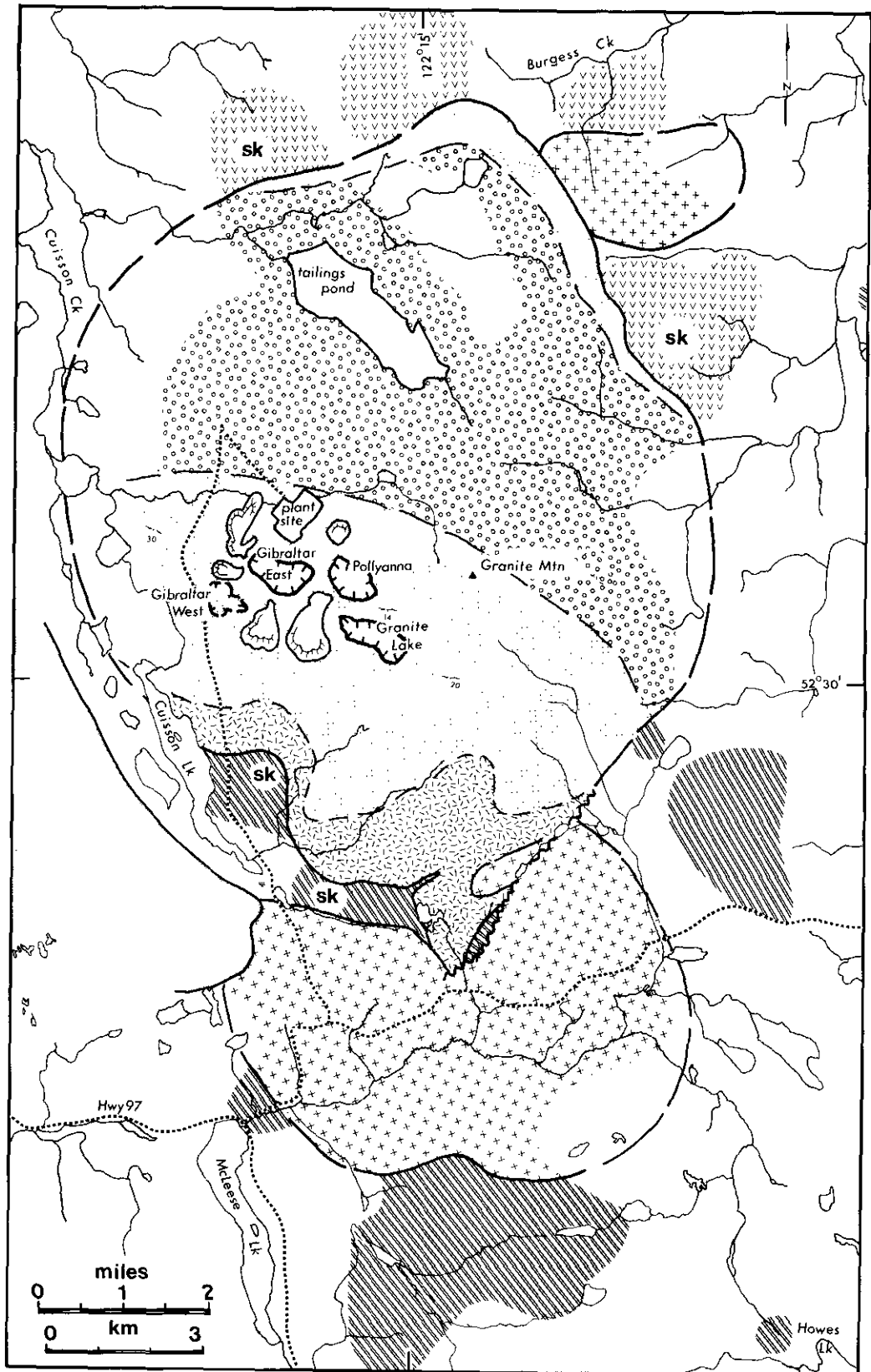


Figure 8. Geology of the Granite Mountain Pluton.

**GRANITE MOUNTAIN MAPPING PROJECT
LEGEND**

COVER ROCKS

OVERBURDEN



TERTIARY



BASALT

INTRUSIVE ROCKS

SHERIDAN CREEK STOCK, BURGESS CREEK STOCK

QUARTZ DIORITE, GRANODIORITE



GRANITE MOUNTAIN BATHOLITH

LEUCOCRATIC QUARTZ DIORITE - GRANITE MOUNTAIN PHASE



QUARTZ DIORITE - MINE PHASE AND NORTHERN BORDER PHASE



DIORITE - SOUTHERN BORDER PHASE



BEDDED ROCKS

JURASSIC ?

ANDESITE, GREYWACKE, QUARTZOSE FELDSPATHIC WACKE, SILTSTONE



PALEOZOIC (CACHE CREEK GROUP)

SILTSTONE, SHALE, GREENSTONE, CHERT, GREYWACKE, LIMESTONE



SYMBOLS

GEOLOGIC CONTACTS: APPROXIMATE, INFERRED, FAULT



FOLIATION



SKARN

QUARTZ-EPIDOTE-CALCITE-CHLORITE (HEMATITE) AND
EPIDOTE-GARNET-MAGNETITE-QUARTZ (CHALCOPYRITE)
ASSEMBLAGES IN VOLCANIC ROCKS

sk

ROAD



WASTE DUMP



MINE PIT



feldspar grains and rare granitic clasts. The presence of such clastic rocks with a mixed volcanic and granitic provenance suggests that they are relatively young, possibly Early Jurassic in age.

In a number of locations along the contact, skarn is present (shown as SK on Fig. 8). Skarn assemblages most commonly contain garnet-epidote-magnetite and rare chalcopyrite. In the northwestern locality the skarn minerals are epidote-quartz-calcite-chlorite with rare specular hematite.

Conclusions drawn from this mapping project are as follows:

- (1) Economic mineralization appears to be restricted to one of the three main phases of Granite Mountain batholith, namely quartz diorite. The diorite border phase and leucocratic quartz diorite in the north are only weakly mineralized.
- (2) Ore deposits and the important mineral showings are within or close to strongly foliated rocks, all well within the batholith.
- (3) The presence of chalcopyrite, magnetite, and hematite in some of the skarn zones indicates that economically significant mineral deposits may have formed peripheral to the batholith.

The writer acknowledges the able assistance in the field of D. B. Hopper and B. D. Ripley. Cooperation of Gibraltar Mines Limited's staff is appreciated.

REFERENCE

Drummond, A. D., Sutherland Brown, A., Young, R. J., and Tennant, S. J. (1976): Gibraltar: Regional Metamorphism, Mineralization, Hydrothermal Alteration, and Structural Development, *C/M*, Special Vol. 15, Porphyry Deposits of the Canadian Cordillera, pp. 195-205.