

MINERALIZATION

IN

GRINNELL FORMATION

82/6/SE/4

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ILLISTRATIONS

Map 35-1961 - Fernie, British Columbia - Alberta      IN POCKET

MINERALIZATION IN GRINNELL FORMATIONGENERAL

The Grinnell Formation is part of a conformable series of Precambrian argillites, carbonates and quartzites occurring in the extreme southeast part of B. C. and southwest part of Alberta. In this area the Precambrian rocks have been thrust eastward over Mesozoic and Cenozoic formations.

Yarrow Creek - Spion Kop Ridge Property

This property, comprising about 75 claims, is located on the Alberta side just north of Waterton Lakes National Park. It is owned by Mr. Frank Goble and is presently under option to Akamina Minerals. The claims were optioned to Kennco in 1966 - 67 and were prospected, sampled, and drilled at that time. Drilling consisted of 3 A.X. holes which totaled 203 feet and one B.Q. hole drilled to a depth of 357 feet. Thirty-one surface chip samples were taken over a total length of 610 feet.

Mineralization, consisting of chalcocite, bornite, chalcopyrite, pyrite, and malachite, occurs in the quartzites of the Upper Grinnell, at margins of Purcell diorite dikes and sills, in quartzites of the Appekunny and of the Lower Grinnell where they are adjacent to dikes and sills, and in thin quartzite bands at the base of the Siyeh Formation.

Within the Grinnell mineralization occurs only in white or green quartzite associated with green argillite. Bornite, chalcocite, chalcopyrite, and pyrite occur as small blebs and as fine disseminations within the quartzite. In some areas small flattened pebbles of

argillite within the quartzite are mineralized. These pebbles probably represent intraformational conglomerates. On weathered surfaces malachite staining tends to be only weakly developed, whereas it may be quite extensive along freshly broken fractures.

Most of the mineralized quartzite bands are very thin (less than 1 foot) and the mineralization appears to extend only a few 10's of feet laterally. One 10 foot quartzite band, containing 1.5 - 4 feet of mineralization is said to have been traced by Kennco for 2500 feet. The Kennco drilling cut most of the favourable part of the Grinnell but encountered only short mineralized sections (usually less than 1 foot) with total copper content of about 0.1 %. Over 5 foot sections these averaged 0.01 to 0.1 %. Outside of the drilled area several 6 inch quartzite bands were noted with chalcocite disseminations and which may average up to 3 % copper.

Some of the Purcell sills are mineralized but, as reported by Kennco, only where they exhibit fine-grained chilled margins. Mineralization of this type which was examined consisted of very fine-grained disseminated chalcocite. Diorite dikes are also mineralized, some with sulphide veinlets and disseminations only along the margins, but some with sulphides throughout. Sulphides also occur as fine fracture fillings in quartzite marginal to the dikes. In one sill on Spion Kop Ridge at the north end of the claim group, Kennco outlined a block by surface sampling measuring 1000 x 1000 x 10 feet and containing 1.83 - 3.45 % total copper.

#### Kishinena Creek Property

This property, located in B. C. near the southwest extent of Grinnell outcrop in Canada, is also owned by Mr. Frank Goble. At

present Mr. Goble has about 20 claims located here but he plans to stake a total of 40.

Kennco staked about 25 claims here in 1966 - 67, but did not record them. They apparently had one man prospecting the area for several weeks. They also put in a 40 foot trench which did not cut any sulphides.

A fairly complete section of most of the Grinnell Formation was examined in detail along Kishinena Creek. Only a few 6 inch to 1 foot bands of very weak mineralization were found.

#### CLAIM STATUS

The outline of claims is shown on the accompanying maps. The present prospecting permits on the Alberta side cover all the Grinnell Formation.

Permit numbers 58, 63-68 and 71 are all owned by Akamina Minerals. Permits 64 and 65 have been optioned to C. M. & S. Permits 62 and 63 have apparently expired and may be available for application within the next two months. Listed owners (all of Calgary) of the other permits are as follows:

- 70. J. W. Worobec & M. E. McMartin
- 71. J. W. Worobec & M. E. McMartin
- 72. D. R. Machon
- 140. W. B. Buzan & M. E. McMartin
- 141. W. B. Buzan & M. E. McMartin

The expiry date of some of the permits are listed below. All except # 72 have apparently been renewed.

58 -5 July 1969

67 -3 October 1969

64 -29 August 1969

68 -3 October 1969

65 -29 August 1969

70 -7 November 1969

66 -3 October 1969

72 -10 December 1969

On the B. C. side Mr. Goble holds two blocks of claims, a northern group of about 44 claims lying just north of Commerce Peak and a southern group of about 20 claims in the vicinity of Kishinena Creek. Mr. Goble plans to add an additional 20 claims to this southern group. Akamina Minerals holds ground surrounding Goble's northern group and also covering the isolated Grinnell outcrop in the extreme northwest part of the map area. The ground between the Kishinena Creek group and the U. S. Border is apparently open. A part of the ground between Goble's northern and southern claim groups has been staked (October 24 and 25) by Strato Geological Ltd., acting as agent for Sy Mark. These claims have apparently been witness staked from valley bottoms with no effort to properly locate claim posts even in fairly accessible areas. Most of this ground can probably be acquired by legal staking.

#### CONCLUSIONS AND RECOMMENDATIONS

The mineralized zones examined are too thin or too small to be of any economic interest; however, since Bear Creek has apparently located a sizeable copper deposit within the same formation near Troy, Montana, a regional examination of the Grinnell Formation is worthwhile. Because of the difficult terrain and lack of readily visible signs of mineralization on weathered surface outcrops, it is unlikely that the area has been prospected in sufficient detail.

In order to obtain prospecting ground the two claim groups of Mr. Goble's can be optioned and the surrounding open ground staked.

An effort should also be made to obtain rights to the expired prospecting permits 62 and 63.

Much of the exposed Grinnell is above timberline and can be adequately covered by detailed examination of outcrops; however, helicopter support will be necessary and the personnel concerned should be experienced enough to handle themselves on the steep bare slopes. They should also be able to make hand lens identification of fine-grained sulphides. In prospecting it will be necessary to break fresh rock across every section of Grinnell examined.

Before the field program begins, the geologist in charge should make the following investigations:

1. Compile data regarding all known "stratabound" copper deposits.
2. Compile the known stratigraphy of the Precambrian rocks within the area of Grinnell outcrop. Some of this data might be obtained from gas well logs.
3. Examine available gas well cuttings from this area for stratigraphy as well as for the presence of sulphides.

The geologist should work closely with the prospectors and direct the sampling of any interesting showings. The proposed geologic field studies include:

- 1) A determination of the distribution of sill and dikes within the Grinnell and the relationship of mineralization to these igneous rocks.
- 2) A regional mineralogic and stratigraphic correlation throughout the Grinnell outcrop area available for study.

The latter work should be directed towards a determination of the relationship of mineralization to specific stratigraphic horizons, to distance from original source area, and to sedimentary environment. The regional data may be useful in evaluation of other similar areas within this section of the Rocky Mountains.

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