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R. V. KIRKHAM

SUMMARY GEOLOGY OF THE YORKE-HARDY MOLYBDENUM DEPOSIT

INTRODUCTION

The deposit is located on the eastern flank of Hudson Bay mountain five miles northwest of Smithers, B. C. Molybdenite bearing veinlets exposed between 3500 and 5000 feet in elevation in Glacier Gulch were staked in 1956 by Mr. W. Yorke-Hardy and associates. Subsequent surface drilling by Southwest Potash defined an area of economic significance. Current exploration is being undertaken by Climax Molybdenum B. C. Ltd. from an adit at 3500 feet in elevation.

REGIONAL GEOLOGY

The area is underlain chiefly by volcanic and sedimentary rocks of the Hazelton Group, and sedimentary rocks of the Bowser Group. Most of these rocks are considered to be Jurassic in age. A few small bodies of granodiorite and quartz monzonite occur in the northern and western parts of the Hudson Bay Mountain area. Small greenstone, diabase, diorite and felsitic intrusions are found in the volcanic sequences.

Structural geology is complex, both in a regional and a detailed sense. Lack of primary structures in many of the volcanic units, absence of good marker horizons and the presence of numerous alteration and/or bleached zones make projections and structural interpretation difficult. It has been postulated that most of the major structural features are related to doming.

DETAILED GEOLOGY

1. ROCK TYPES

Molybdenite mineralization occurs over an area of approximately one mile by one and one-half miles in the vicinity of the toe of the glacier in Glacier Gulch. Mineralization is known to extend to depths greater than 3000 feet below the surface.

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Most of this area is underlain by a bedded pyroclastic sequence of highly altered and metamorphosed Hazelton volcanic rocks of intermediate composition. These rocks are mostly dark brown to black tuffs, crystal tuffs and lapilli tuffs. Some felsitic intrusions occur within the pyroclastic pile. Locally these rocks have been extensively bleached.

Some of the most westerly portion of the mineralized area is underlain by clastic sediments of the Bowser Group that unconformably (?) overlie the volcanic strata. These rocks are mostly interbedded greywacke, slate, quartzite, argillaceous quartzite, argillite, conglomerate and minor low grade anthracite coal.

A wedge shaped sheet of granodiorite-granodiorite aplite up to 2000 feet thick subcrops below much of the mineralized area, and is host to most of the mineralization of economic significance. Much of this sheet is characteristically very fine grained, and is granophyric to graphophyric in texture. The distribution of femag minerals (mostly chlorite, garnet, epidote) is erratic and much appears to have replaced the fine grained granophyric quartz-feldspar fabric of the rock. This unit is considered to be pre-Upper Jurassic in age.

Three small porphyry bodies and a sub-radial swarm of small intra-mineral quartz-feldspar porphyry dikes occur in the Glacier Gulch area. These intrusive rocks have been tentatively dated as Tertiary (biotite dating of 67 $\pm$ 5 m.y. by the G.S.C. from a small porphyry body). The radial trending intra-mineral quartz-feldspar porphyry dikes may be slightly younger as a K/Ar date obtained from hornblende in a molybdenite bearing quartz vein is 49 $\pm$ 8 m.y.

A second concealed intrusive mass of quartz latite-quartz monzonite porphyry subcrops 3000 to 3500 feet below the crest of the ridge south of the glacier and several hundred feet below the granodiorite sheet as exposed on the level. This body is also considered to be Tertiary in age as a number of related intra-mineral quartz porphyry dikes have been encountered near the top

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of the intrusion.

2. STRUCTURAL GEOLOGY

The Hazelton volcanic rocks trend easterly, and dip at moderate to steep angles to the north. Only broad, open, warping folds have been recognized in this unit. These rocks are unconformably (?) overlain by Bowser group sedimentary rocks that trend north to northwest and dip moderately to the east. Tight isoclinal folds, as well as broad flexures have been mapped in this unit. Doming has been postulated to explain the broad open folds in the sedimentary-volcanic complex.

The wedge-shaped "granodiorite" sheet exhibits both concordant and discordant relationships with the pyroclastic rocks. Much of the northern portion of the hanging wall contact is concordant, whereas both the footwall contact and the hanging wall contact to the south are discordant.

All of these rocks have been intruded by a series of small acid tertiary intrusives. The Intra-mineral quartz-feldspar porphyry dikes exhibit a weak radial trend with a focus to the west of the existing workings.

Regionally, major faults and lineaments trend nertherly to north easterly. In the underground workings a series of small northwesterly trending, steeply dipping faults have been encountered. Since these cut ore, but do not appreciably off set the granodiorite contact, their displacement is considered to be slight.

3. ALTERATION

Hydrothermal alteration and/or "bleaching" is widespread on Hudson Bay Mountain. As yet no specific type can be directly related to molybdenite deposition. However there is a vague relationship of "bleaching" (involving the remobilization and removal of femag) and possibly recrystallization, as well as a pervasive carbonate-sericite $\pm$ chlorite, feldspar alteration in areas of more intense mineralization.

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4. MINERALIZATION

Most of the molybdenite occurs in a stock-work of hairline fractures and quartz veinlets and in a series of large (up to 2 feet) layered quartz-molybdenite veins. Assay limits define a moderately westerly dipping zone of economic significance that is almost entirely contained within the easterly to northeasterly dipping "granodiorite" sheet. No explanation is available for this remarkable host rock favourability. Mechanically, the intensity of veining is little reduced outside the assay limits, and chemically the bulk composition of the bleached tuffs approximates that of the "granodiorite".

There appears to have been at least three periods of molybdenite deposition, with the radial trending porphyry dikes being intra-mineral to the two earliest phases.

Common associates or molybdenite are pyrite, chlorite with minor amounts of magnetite, biotite, hornblende, K feldspar, muscovite, gypsum, stilbite, pyrrhotite, chalcopyrite, scheelite-powellite, bismuthinite, tennantite, arsenopyrite, calcite, and native arsenic.

5. ORE GENESIS

The intra-mineral nature of two of the Tertiary intrusions not only dates the period of mineralization, but is strongly suggestive of a source for the required hydrothermal solutions and activity. Much work is yet to be done to determine the distribution of the Tertiary intrusions and their physical relationships to the known ore zones. The mechanical agencies that produced the stock-work fracturing is also open to conjecture.

GEOLOGICAL FEATURES

IN THE 3500 LEVEL ADIT

FOOTAGE FROM PORTAL	REMARKS
0-1320	Bowser Group sediments. Upper Jurassic in age. Coal measures 0-100 feet.
1320	Basal contact of Bowser Group. Unconformity and/or weak fault. This point marks a structural disconformity.
1320-2580	Hazelton volcanic rocks.
1420	First reported molybdenite.
2040	Abrupt transition from "pyrrhotite zone" to "pyrite zone" - gradational 2020-2060 feet.
2580-3803	Hazelton volcanic rocks characterized by extensive "bleaching". Start of .0X MOS_2 zone coincides closely with this point.
3803-3963	Aplite. Hanging wall sill. Start of plus one-tenth MOS_2 zone.
3963-4040	Hazelton volcanic rocks.
4040-End	Various phases of the "granodiorite" sheet.

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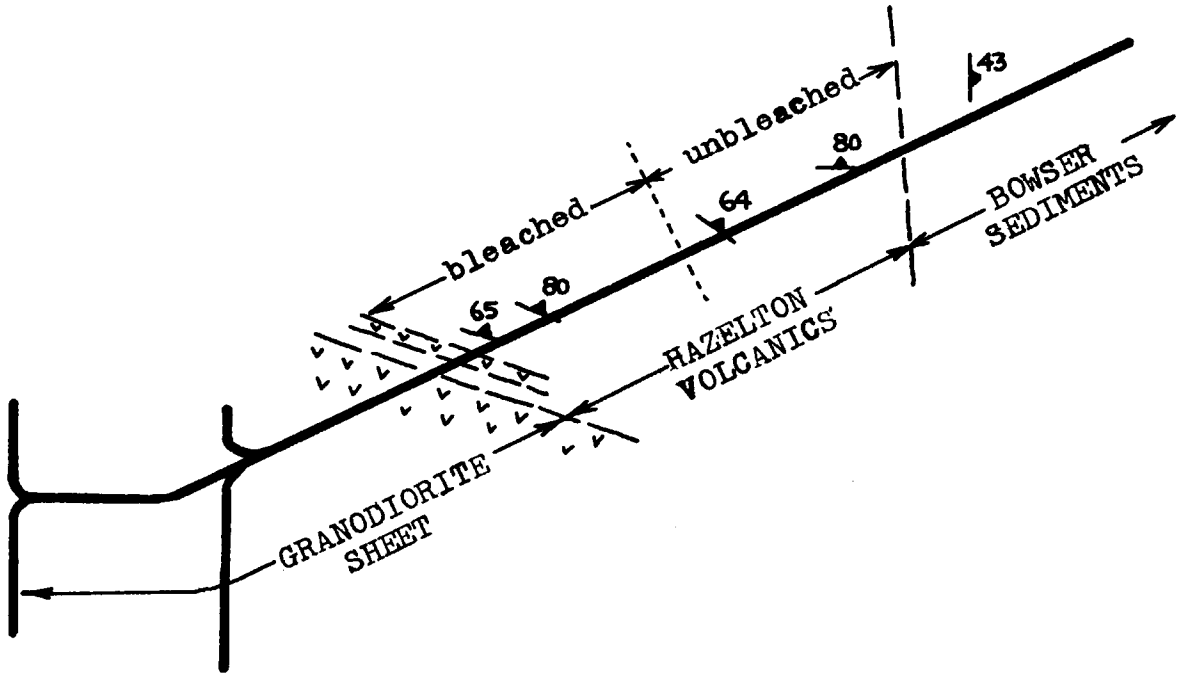


3500 LEVEL

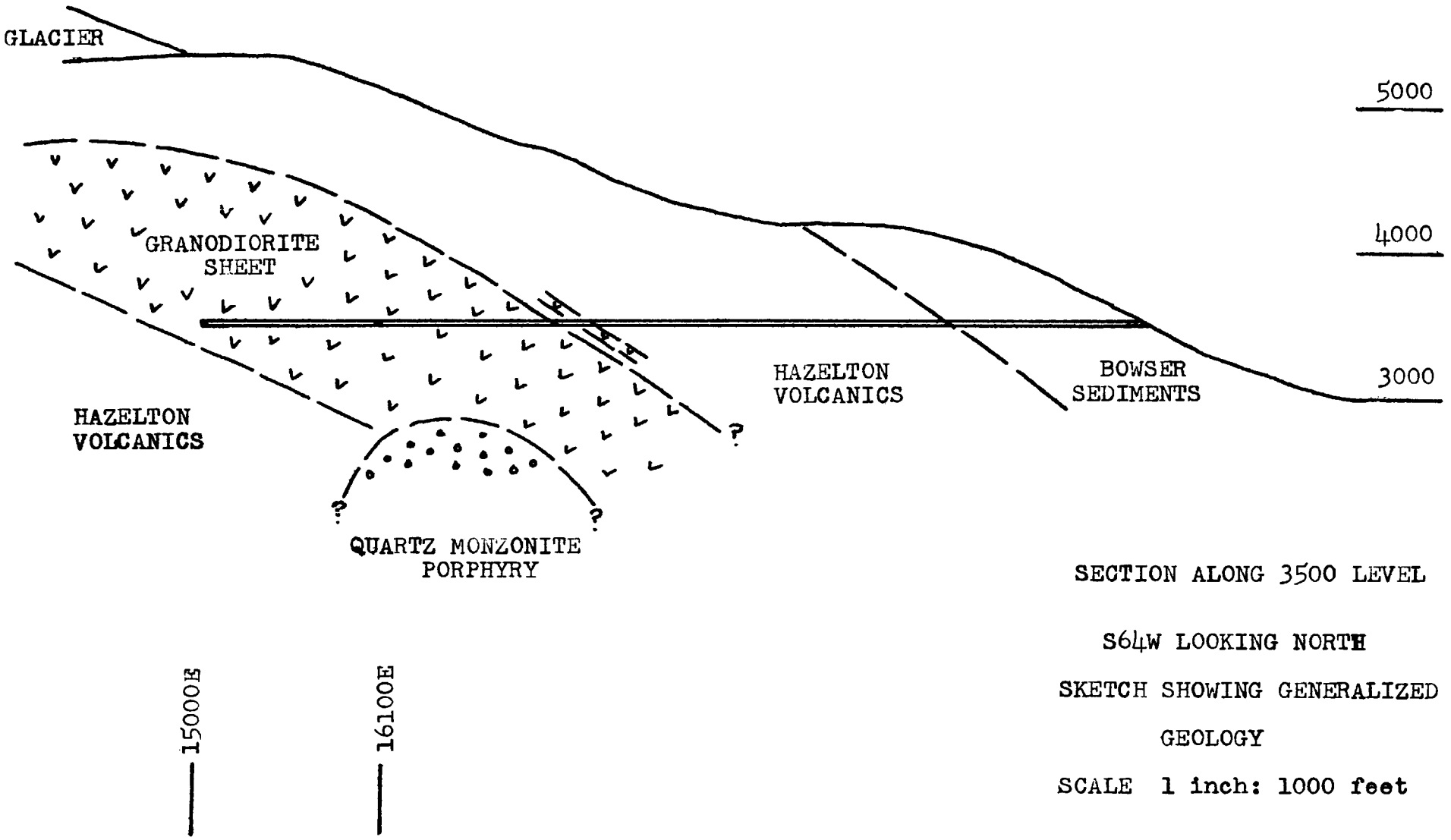
SKETCH OF GENERALIZED GEOLOGY

SCALE 1 inch: 1000 ft

15000N

15000E

20000E



SECTION ALONG 3500 LEVEL

S64W LOOKING NORTH

SKETCH SHOWING GENERALIZED

GEOLOGY

SCALE 1 inch: 1000 feet