EXPLORATION

N.T.S.: 93N/2

WESTERN DISTRICT

16 FEBRUARY 1976

FILE NOTE

JEAN PROPERTY

N.B.C. SYNDICATE

PETROGRAPHIC STUDY OF HORNFELSES FROM JEAN PROPERTY

I.A. PATERSON

Spec. # a) G760053

b) 75-4-334

Rock Type a) biotite amphibolite hornfels

b) basic volcanic

Minerals: plagioclase (60%) biotite (25%), amphibole (15%).

minor ilmenomagnetite.

Textures:

- 1) coarse grained plagioclase porphyroblasts in fine grained matrix. The porphyroblasts may have formed from primary plagioclase pheno-
- 2) note cluster of biotite round ilmenomagnetite grains.
- 3) quartz in veins.
- 4) inhomogeneous distribution of mafics.

Origin: a) original rock may have been an augite feldspar porphyry.

Spec. # a) G760054

Rock Type a) biotite amphibolite hornfels

b) 75-4-504

b) basic volcanic.

Minerals: plagioclase, hornblende, biotite, minor sericite.

Texture: homogeneous, decussate.

History: original rock was probably a basic volcanic.

Spec. # a) G760055

Rock Type a) biotite amphibolite

hornfels (mineralized).

b) 75-4-375

b) basic volcanic (alkaline?).

Minerals: plagioclase (60%), hornblende (15%), biotite (25%).

veins: plagioclase + chlorite + carbonate

<u>+</u> prehnite <u>+</u> sphene <u>+</u> chalcopyrite

Textures: homogeneous decussate texture with alteration zones along veins.

History: a) original rock was an alkaline basalt.

- b) contact metamorphism to hornblende hornfels facies
- c) late fracturing and veining at reduced temperature.

Spec. # a) G760056

Rock Type a) biotite amphibolite hornfels.

b) 75-1-180 b) basic volcanic (alkaline)

pale green amphibole, plagioclase, biotite Minerals:

vein: plagioclase, actinolite (?), sphene, chalcopyrite.

History:a) origin as alkaline basalt.

- hornblende hornfels facies metamorphism b)
- c) late veining and mineralization.

NOTE: minerals underlined are major constituents.

Spec. # a) G760049

b) 75-2-395

Rock Type a) biotite, quartz, amphibolitic hornfels

b) volcaniclastic sandstone or siltstone

Minerals: amphibole, plagioclase, quartz, biotite, sphene

veins: pyrite, quartz, chlorite

Textures: note layering in hand specimen caused by biotite rich and biotite

deficient zones.

History: layering and high quartz content suggests sedimentary origin.

Spec. # a) G760050

Rock Type a) biotite, dolomite, plagioclase quartz hornfels

b) 75-3-214

b) calcareous siltstone.

Minerals: The thin section is divided into three zones - a,b, and c. Zone a consists of bands of dolomite and quartz which seem to have formed along a late shear zone. Zone b is grey in colour and consists of microgranular biotite, dolomite, plagioclase and quartz. This zone is transected by oatmeal coloured bleached stringers and blebs consisting of quartz, plagioclase and albite. Biotite appears to have been completely altered in this zone.

History:

- a) original rock may have been a calcareous siltstone.
- b) crystallization of biotite, plagioclase, dolomite, quartz assemblage.
- c) formation of bleached zones and stringers composed of carbonate, plagioclase and quartz.
- d) formation of mylonite zones and crystallization of dolomite and quartz along these zones.

Spec. # a) G760051

b) 75-4-147

a) hornblende,plagioclase,quartz hornfe

Rock Type: b) volcaniclastic standstone or silt-

stone.

Minerals: hornblende (29%) plagioclase + quartz (60%), sphene

minor chalcopyrite, magnetite.

Textures: homogeneous texture except for clots and stringers of hornblende

with no evidence of existence of fragments, phenocrysts, etc.

History: original rock type was possibly a volcanic silstone or fine grained

tuff. I don't think it was originally a basic volcanic because of

high quartz and low mafic content.

Spec. # a) G760052

Rock Type:

a) biotite amphibolite hornfels

b) 75-4-253 b) basic lava

Minerals: biotite (20%), amphibole (40%), plagioclase (40%).

Texture: homogeneous, decussate.

April 9/94 I called I'm Monger at the ESC to see what he thought Atte conclusion that melanosphic grade from I is indicated in the direction of the introduction of the introduction of the interior than a fault is indicated. He says the black that is sootic could be called a HORSE (spelly?). A home is a block within a fault the says. He Says 300 10 (was) a very good that he does not know if he kept his skul up. He says he, citizen by has full confidence in the work done by Than at The this of the report

PETROCRPHIC STUDY OF HORNFELSES FROM JEAN PROPERTY

The purpose of this study was to check contact metamorphic effects of Jean Pluton on Takla Group rocks. It was considered that if there was no appreciable increase in metamorphic grade towards the southern contact of the Jean pluton, the evidence for a fault along the contact would be substantiated.

Summary of Results

The specimens were obtained from drill core and outcrops of the Takla Group volcanics and sediments involved in contact metamorphism near the southern contact of the Jean diorite. Locations are given in Fig.

Most specimens yield assemblages characteristic of the hornblende-hornfels facies suggesting a temperature of $500\pm100^{\circ}\text{C}$ for metamorphic recrystallization. The equilibrium assemblages are as follows:

- a) meta-impure limestone or metasomatized limestone: diopside + grossular + idocrase + plagioclase.
- b) meta-basic igneous (possibly augite porphyry): hornblende + plagioclase + biotite.
- c) meta-volcaniclastic: hornblende + plagicclase + quartz + biotite.

No obvious change in metamorphic grade was dectected between 1500' and 200' from the southern contact. The pyroxene hornfels facies is not developed in the immediate vicinity of the intrusion. This fact substantiates the idea that the southern contact of the Jean pluton may be faulted.

The mineralization at the Jean property is fracture controlled and occurs mainly within the hornfelsed basic rocks. The opaque minerals chalcopyrite, pyrite and magnetite occur in veins and are associated with chlorite, carbonate, plagioclase, sphene and prehnite. This assemblage probably formed in the temperature range 250-350°C. The skarn rocks have also undergone a retrograde metamorphism associated with fracturing and chalcopyrite mineralization. Retrograde minerals include epidote, sphene, chlorite, tremolite, pyrite and magnetite.

In summary the sequence of events in the hornfelses seems to have been:

- a) contact metamorphism.
- b) formation of fault zone along contact, cooling, fracturing, mineralization and retrograde metamorphism of Takla Group hornfelses.

1 d Paterson

I. A. Paterson

IAP/pm 16 February 1976 Spec. # a) G760044

b) 74-69

Rock Type: epidotite

Minerals: epidote (95%)

feldspar, tremolite, calcite, quartz, chlorite.

History:

original rock prior to epidotization may have been an augite

feldspar porphyry.

Spec. # a) G760045

b) 74-14a

Rock Type a) biotite + amphibole + quartz

+ plagioclase hornfels

b) volcaniclastic sandstone (?)

Minerals:

plagioclase (40%); quartz (35%); pale green amphibole (20%); biotite

(5%) minor apatite

Texture:

decussate fabric; no relict textures present.

History:

original rock type is thought to have been a volcaniclastic sandstone

or siltstone because

a) high quartz content; (b) absence of porphyritic texture.

Spec. # a) G760046

b) 74-50

Rock Type: a) biotite amphibolite hornfels

b) basalt (alkaline?)

Minerals: matrix - plagioclase, pale green amphibole, biotite

veins - quartz, pyrite, epidote, chlorite, sphene.

Textures: no obvious relict volcanic textures, homogeneous, decussate,

equigranular.

History: after amphibolite facies metamorphism, rock was fractured and veined.

Spec. # a) G760047

b) 75-2-184

Rock Type a) biotite=amphibolite hornfels.

b) basic volcanic

Minerals: matrix: biotite, amphibole (actinolite?), plagioclase.

veins: pyrite, quartz, chlorite, sphene.

History:

original rock type may have been a basalt or a volcaniclastic silstone.

After contact metamorphism and cooling, the rock was fractured and

veined.

Spec. # a) G760048

Rock Type a) quartz amphibole hornfels

b) volcaniclastic (?)

b) 75-2-294

Minerals: amphibole, plagioclase, quartz, biotite, pyrite in veins.

History:

possibly a volcaniclastic originally, because of absence of porphyri-

tic texture and high quartz.

Petrographic Descriptions

Spec. # a) 760040 (Lab)

Rock Type a) grossular + diopside +

idocrase + plagioclase skarn

b) 74-61 (field)

impure limestone (original lithology)

Minerals: garnet, diopside, idocrase, plagioclase, sphene, phlogopite, calcite, epidote (retrograde)

History: skarn formed during metamorphism of impure limestone or metasomatism of

pure limestone near intrusive contact.

Spec. # a) G760041

Rock Type a) grossular + diopside +

plagioclase skarn

b) 74-6+133

b) impure limestone.

Minerals: grossular, diopside, plagioclase

epidote, sphene, chlorite, tremolite, apatite, pyrite, magnetite

(retrograde or vein minerals).

History: a) formation of grossular + diopside + plagioclase skarn.

b) retrograde metamorphism and mineralization.

Spec. # a) G760042

b) 74-5+31

Rock Type a) amphibolite

b) plagioclase augite porphyry.

Minerals: amphibole, plagioclase

sphene, chlorite, pyrite, chalcopyrite.

Textures: decussate grains, note coarse grained porphyroblasts of plagioclase

and amphibole set in fine grained matrix of same minerals; Suggests

relict porphyritic texture.

History: post metamorphic fracturing and sulphide mineralization.

Spec. # a) G760043

Rock Type a) amphibolite partly replaced

by skarn minerals.

b) 74-65-75

b) feldspar-hornblende porphyry.

<u>Minerals: idocrase, garnet, diopside, plagioclase, hornblende, epidote.</u>
accessory calcite, sphene.

Textures: plagioclase phenocrysts replaced in part by plagioclase, epidote or

diopside; diopside tends to rim garnet.

History:a) original rock type was a feldspar + augite or hornblende porphyry.

b) after metamorphism to an amphibolite, rock appears to have been partly replaced by skarn minerals.

c) this zone may represent a band of altered volcanic porphyry adjacent to the impure limestone.