

Della Mines Ltd, Mt Haskins, Cassiar
(Helen Lake deposit)

3/8/72.

Area underlain by 1) greyish m. gr. porphyritic to aplitic granite which intrudes and contact metamorphoses 2) a ~~series~~ ^{pile of} ? Lower Cambrian Atou Group sedimentary rocks. In the area north of Helen Lake these sediments consisted mainly of banded argillaceous to marly sediments (mostly very fine grained) and fine grained clastic sediments mostly in the same grain size - diff. because of recrystallisation to determine their original mineralogy. Reports and mapping by Della speak of graywackes but I did not see any typical graywacke in the ops and core I examined. Also included ~~The contact metam~~ in the sequence are minor calcareous units and some actual limestones.

The contact metamorphism has resulted in these rocks being converted, over a considerable horizontal distance from the granite contact to hornfelses of various categories. The v. fine grained sediments produced typical flinty hornfelses à la Ostfeldt - ~~which~~ with the original layering faithfully preserved in the rapidly alternating hornfels types: plagioclase; plag-dropside, dropside and biotite hornfelses being most prominent. More calcareous layers appear to have recrystallized to fine-med grained brown-red (? gross) garnets with might be classed as skarn rather than hornfels.

It is these flinty, microcrystalline hornfelses which have been mapped as chert ^{by} the Company geologists. They form very prominent, topographically high ops towards the north of the area (not being mineralized significantly here though). They are to be seen in the artificial ops over the area of drilling from this high ground down and beyond the camp at Helen Lake.

The same type hornfelses were only observed in drill core and nothing was learned of their

horizontal distribution

North of the high ground in detail by the ~~cliffs~~ flinty hornfelses the ground falls away rapidly. This area is mapped as skarn on the Della maps, but this seems a simplification of the picture. ~~There are~~ Skarn (calcareous) bands are more abundant here than to the SSW but they occur as layers in the general hornfels sequence.

It is these calcareous horizons (now skarn) which have been the ^{loci} of the often massive sulphide (Zn(Cu) Fe) deposition which occurs along the contact zone in this area.

The moly mineralization — almost wholly a qtz vein associated one is confined to the brittle hornfelses and the upper part of the intruding granite porphyry. There is a general qtz vein system in fractures here, but not all of this is necessarily moly bearing. Very little moly mineralization was seen on surface outcrop, but this also could be a function of the lack of otc in the deposit area — this is almost entirely in the form of bulldozer rippings near the drill holes. ~~The~~

The hornfelses seen in these rippings show a considerable variety of types from homogeneous, through interlayering on a metre to dm scale, down to the finest laminations — and likewise the mineralogical types of hornfels can vary considerably.

More evidence of mineralization is to be seen in the surface otc's of "granite", especially in the topo highest part of the area between DDH5G3 and G1.

The granite nearest the contact to the left is a fine grained greyish white variety, in places

showing a distinct 'direction' (due to ? "shearing")
 Milky white Qtz veins, sometimes with moly flakes,
 are prominent in o/s. Some o/s show heavy Qtz
 veining in a ^{sub-}parallel, often flat lying pattern, with
 the individual veins from mm or so to 1-2 cm in
 thickness. The veins branch + cross, but the
 dominant direction (and of the thicker veins) is ca NE.

Both the fine grained granite and its Qtz veins
 are cut by a later ~~vein or dyke~~ set of m-c.
 gr. granite dykes or veins 1-5 cm thick
 [In my notes I express doubt as to what this
 "border zone" f. gr. granite really is - whether it
 is a true ~~granite~~ f. gr. or aplitic border facies
 or a hybrid zone based on some Qtzite, partly
 "granitized" or something similar] See DEL II.

Moly can also be seen in o/s in this area
 not directly associated with g. vs but more coating
 fracture planes. It is usually quite f. gr., scaly
 in appearance.

(See colour photo of Qtz veining in a block of granite
 here)

To the north around hole G4 the o/s show a
 different type of granite, a coarser more homog.
 type without visible Qtz veining (see DEL 14)

Similarly between G1 and G5 are artificial
 o/s of a f-m. gr. even textured granite, be-
 lieving and without visible Qtz veining or moly. (DEL 16)

The eventual relation between these last two
 types and the fine grained & mineralized ? granite
 are not revealed due to lack of exposure.

However to judge by drill core the granite in
 the mineralized area rather quickly goes over
 in depth (away from contact) to a definitely
 porphyritic type (white feldspar + grey Qtz planes)
 Not a perfect porphyry as the 'gm' is in itself
 fine to med grained and the minerals often show

4
a seneate texture but here ^{are} ~~is~~ already always
enough phenocrysts to ensure a definition
↳ porphyry.

Partial drill core logs and observations.

Hole G1 Drilled wholly in granite in moly zone.

ft.

- 0-30 Rather homog med gr. gran. rooted jt planes down to 20ft or so. Greyish Qtz veins 1-10mm crossing core. Larger ones carry moly (see DEL 21 at 28.5')
Analysis 20-30ft 0.126 MoS₂.
- 30-50 As above. Still occas. sl. rootings on jt. Analysis planes. Numerous thin (1-4mm) Qtz v.s. MoS₂
Occasional m-c gr granitic dykes or veins. 30-40' 0.074%
f. gr. moly in a number of the Qtz veins. 40-50' 0.146%
(DEL 22: 46')
- 50-70 Granite has taken on definite porphyritic appearance. White feldsp phenos up to 4-5mm. Lesser Qtz veinage.
50-60' 0.052%
60-70 0.037%
(DEL 23: 68.5')
- 70-90 As above. 75-78' thin coating of yellowish mica flakes along fracture planes || core
70-80' 0.039%
? sericite (only signs of "alteration" so far)
80-90 0.102%
(DEL 24: 76')
- 90-110 Zone of strong mineralization. Considerable no's of Qtz veins, often up to 3-4 cm thick, carrying much f. gr. moly. In places a definite greenish line to granite, indication of possible alteration (? a propylitization?)
90-100 1.370%*
Also thin odd bands of skarn minerals
100-110 0.170%
-hb epid - indicating possible contamination
(DEL 25: 90.6', DEL 26: 110', DEL 27: 92.75')
- 110-130 Fairly homog., rather greenish granite. Qtz veins and moly somewhat lacking.
110-120 0.050%
120-130 0.017%
120 feet noted in log as bottom of possible economic mineralization.

(DEL 28: 120', DEL 29: 123.5')

| | | |
|---------|--|----------------------------------|
| ft. | | MoS ₂ |
| 130-150 | Similar to above. Very little mineralization to be seen (DEL 30: 139.5') | 130-140 0.019% 140-150 0.015% |

| | | |
|---------|---|----------------------------------|
| 150-170 | Similar to above, but qz v's and f. gr. mostly a little more in evidence. (DEL 31: 151', DEL 32 167.5') | 150-160 0.045% 160-170 0.034% |
|---------|---|----------------------------------|

| | | |
|---------|--|-------------------------------------|
| 170-190 | Very similar to above 170-180' (DEL 33: 176.75') (DEL 34: 188') From 187' a 2-5 cm dyke of aplite cuts the granite core at a low angle. | 170-180 0.023% no analyses below |
|---------|--|-------------------------------------|

190 → Core not split below 186.5'.
 Rather homos. grey med-c. gr. granite
 Definite oriented texture in the biotites - this is quite general in this type of rock
 2 parts prominent open jt planes at low angles to core; rusty, and at one place heavy deposition of py - probably very late? supergene?