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GEOLOGICAL REPORT ON THE ZEL GROUP

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Geological Report on the Zel Group

Vancouver M.D., Mount Donaldson, 49°30' - 123° NW

Owner: Zel Syndicate

By

W. Leszczyszyn, B.Sc., July 16-23, 1965

for Bralorne Pioneer Mines Limited

Introduction

This report has been prepared for submission as assessment work of geological mapping on the Zel Group of claims by the writer and assistants in the time from July 16-23rd, 1965.

Location and Access

The group of eight claims is located on Mount Donaldson, including all of Smithe Lake and the north half of Slippery Lake. The claims are situated between elevations of 4100 and 5500 feet above sea level. Mount Donaldson is approximately 35 air miles north north-west of Vancouver. Access was gained via helicopter from Britannia which is 12 air miles distant. Access may also be gained via Salmon Inlet and logging road along Sechelt Creek which is fed by Slippery Creek flowing out of Slippery Lake.

Property

This property was originally staked in the last part of the 19th century and several times since then. The Zel Group of eight claims was staked on the 28th of September, 1964. No other claims are in good standing in the area. The claims are presently held in the name of J.R. Lakes.

Physical Features

From the lake level at Slippery Lake to the peak of Mount Donaldson is approximately 1300 feet with the elevation of the summit being 5512 feet above sea level. Both Smithe Lake and Slippery Lake are glacial depressions with relatively steep walls and rounded ridges. The north and east side of

Smithe Lake and the very south-west corner of Slippery Lake exhibit low rounded cross ridges the tops of which are only a few tens of feet to 80 feet above lake levels.

There is sparse stunted spruce and cedar growth on the ridges. Below 4600 feet elevation there is sporadic but locally fairly dense growth of spruce, cedar and balsam, and this dominantly on the west and south slopes around Slippery Lake.

The lakes are still 90% ice covered with considerable snow along the shore lines. There is also considerable snow in depressions and saddles as well as on the leeward side of the ridges.

Considerable cost and difficulty would be encountered in any attempt at a road from Sechelt Creek or Clowhom Lakes, as the slopes of the valleys are very steep.

Work Program

Geological mapping, sampling, trenching and stripping were conducted from a base camp at the north end of Smithe Lake. Aerial photographs of 1/4 mile to one inch were used in stereo pair for locating and outlining traverses. All the information was recorded and then plotted on a base map.

Regional Geology

The latest regional map is map number 42-1963 published by the Geological Survey of Canada in 1963. This map is a compilation made by H.H. Bostock.

The area concerned is located within the Coast Range Batholith and here is headed under undivided, leucocratic plutonic rocks of cretaceous age and earlier. This general description encompasses all the rocks in the area of the Zel Group of claims.

Property and Surrounding Geology

The geology mapped is presented on the enclosed plan, figure 1, at 1" = 600 feet. Also enclosed is a detailed survey and mapping of the adit on the main fissure vein, figure 2, and a profile of the bluff on the west side of Smithe Lake, figure 3.

Quartz Biotite Granite

The area mapped is part of a major granitic intrusion. The quartz biotite granite is the major rock unit in the map area. It is a medium grained, white to light grey quartz rich granite. The quartz or orthoclase feldspar is rather uniformly interwoven with the average grain size between 0.05 to 0.10 of an inch. Scattered erratically are occasional phenocrysts of quartz and feldspar. Biotite is the only mafic mineral observed and is found to be highly variable in "grain size" but uniform in content. It is a typical brown biotite and there is no preferred orientation of the books and flakes. No primary sulphide mineralization was recorded in this granite except for very rare grains of pyrite.

The percentage content of the granite can be stated as, orthoclase feldspar - 50%, quartz - 40% and biotite - 10%.

This granite is the oldest rock unit in the area with the exception of a small "plum" of hornblendite or hornblende diorite, covering only 1000 square feet in area. This "plum" is situated on the ridge west of Slippery Lake. The hornblendite has either been assimilated by the granite or stems from a deeper magmatic core.

Muscovite Granite

This unit averages 300 feet in width and has an approximate length of 1100 feet. It is situated on the north-west shore of Smithe Lake. It is small in size but unique in character and association.

The rock unit can be classed as a light grey, equigranular, fine grained muscovite granite. The relative percentages of the constituents are, feldspar (orthoclase) 60%, quartz 30%, muscovite mica 5-8%, sulphides (dominantly primary pyrite and chalcopyrite and secondary malachite) 2-5%. Locally where the sulphide content exceeds 5%, their presence is accentuated by a "nodular" appearance displayed by the weathered and stained sulphide cavities.

The muscovite granite undoubtedly is from the same parent magma as the quartz biotite granite but was intruded at a slightly later stage. This is supported by the fact that remnants, irregular in shape and form, of quartz biotite granite are caught up in the hybrid contact zone aureoling the muscovite granite. Parts of quartz veins have also been assimilated.

This assimilation was also associated with minor aplitic dikes and dikelets. No evidence of major mineral replacement was noted, but a very fine and narrow contact reaction including partial recrystalization was recorded.

Quartz and Quartz Veins (Fissure Veins)

There are three major sets of quartz veins paralleling the joint system as is developed in the area. Also there are two areas of locally widespread quartz masses irregular in shape but similar in character to the quartz veins.

The quartz in the veins is dominantly milky in colour and transluscent to transparent. In the larger veins the quartz appears moderately contorted. The vein contacts are either frozen to the wall rock or lined by muscovite plates of varying thicknesses. Locally quartz crystal growth is evident normal to the contact wall. Vugs and cavities are very prevalent in the veins, especially those in excess of 0.75 feet in width. Cavities occupying near full vein width were observed. These cavities and vugs are generally lined with stubby transparent quartz crystals. These vugs may also contain various copper minerals and muscovite flakes and books.

A secondary but very persistent mineral constituent of these quartz veins and masses, is muscovite mica. The mica occurs in three ways in association with the quartz veins and masses; (a) as a contact mineral between the quartz and country rock, both in parallel form aligned with the contact and also oriented normal to the vein walls; (b) as irregular shaped books of mica completely enclosed by quartz; (c) as lining in vugs and cavities. The mica is also associated with the primary copper minerals in the veins.

The copper bearing minerals that have been recognized in descending order are bornite, chalcocite, cuprite, chalcopyrite, malachite and azurite. Also recognized in the veins was molybdenite and pyrite. Assay results have indicated that there may be tetrahedrite associated intimately with the chalcocite.

The veins structurally parallel each other in a confined area. The three sets of veins are as follows; (a) striking east-west and dipping rather steeply south; (b) striking east-west and dipping 40° - 65° north; (c) striking north-south and dipping 0° - 20° west. To group (a) belong the four major veins on the bluff west of Smithe Lake and

are shown on the profile section, figure 3, as main vein, HW #1, #2 and #3. Only #3 hanging wall vein persists westward over the ridge. It is lost in talus and snow on the opposite slope. None of these veins were observed west of Slippery Lake or east of Smithe Lake. Group (b) are best exposed in the saddle north and north-east of Slippery Lake. Group (c) occurs south of group (a) as shown on the geological map, figure 1.

The veins are generally not persistent in length and apparently in depth. The veins commonly fray and split and the splits die out in tight seams and fractures. Locally the veins also split and rejoin. This splitting is more prevalent where the muscovite granite is the host rock. The veins in the hybrid zone have been noted to contain horses and inclusions of muscovite granite within the veins.

The veins vary in width but most are less than one foot in width. The longest strike length is approximately 900 feet, but generally the strike length is less than 300 feet.

Dacite-Rhyolite (?) Dikes

These dikes are dominantly exposed in the saddle north and north-east of Slippery Lake. There are four and they vary in width from 10 to 45 feet. They have been traced over 2000 feet in strike length but are not continuous south and west of Slippery Lake. The general strike of the veins is 70° and they dip steeply north-west.

The composition of the very fine grained aphanitic matrix appears to be of quartz and feldspar. Scattered through the rock are phenocrysts of altered biotite as well as minor phenocrysts of quartz and feldspar. The dikes are light to medium grey in colour and weather to a rubble pile which distinctly stands out in relief.

It could not be determined conclusively if the dikes were pre or post quartz veins due to heavy snow and overburden in vital areas.

Aplite Dikes

They are typical sugary textured granitic dikes. These are generally white to light grey in colour and are equally abundant in quartz and feldspar, with very minor amounts of biotite. The dikes vary in width from 1/2" to 2 feet and generally stand out slightly above the granite

host. The dikes parallel the joint system. They are not extensive in length but occur throughout the map area.

Structure

All the rocks are well jointed in at least two directions with the dominant being east-west $\pm$ 15° and dipping steeply north and south. The secondary system strikes 20° east of north and dips nearly vertical. Two minor secondary systems parallel the above in strike but are very shallow dipping.

No other major structure was recorded.

Alteration

Ground water circulation and weathering have altered the copper sulphides and sulphosalts as well as the pyrite. The bluffs below mineralized quartz veins have been stained with malachite, azurite and rust.

Economic Geology

The principal occurrences which could be considered of economic importance are the copper bearing quartz veins and and the copper bearing muscovite granite.

Mineralized Quartz Veins

Most of the quartz veins examined contain some degree of mineralization. The prime concern of early day prospectors was the high copper and silver content of the massive sulphides in the quartz veins.

Bornite and chalcopyrite are the dominant minerals exposed in the main vein adit. The vein in the adit averages 2.8 feet in width and is exposed for 88 feet along the back. The vein is moderately fractured, locally quite contorted and contains numerous vugs and cavities. The vein walls vary in dip from 45° to 80° to the south and are highly coated with muscovite. The mineralization is erratic and is contained in vuggy cavities, as massive noddules, patches and irregular shaped masses directly enclosed in quartz and also asdiscontinuous stringers with intermittent vuggy cavities. All the primary minerals have been altered to some degree due to the effect of circulating ground water and weathering.

The primary minerals recognized in the main vein are bornite, chalcopyrite, cuprite, chalcocite and molybdenite. Secondary minerals include malachite, azurite and iron oxide stain.

Seven samples taken by Mr. Murray Zulps from the adit were applied to the length and average width resulting in 88 feet of vein averaging 2.8 feet in width and containing 2.9 oz. silver per ton, 8.26% copper and 0.10% molybdenum.

Above the main vein and on the hanging wall are three paralleling quartz veins, striking east-west and dipping south at 45° - 65°. These are referred to as HW #1, HW #2, and HW #3. HW #1 and HW #2 are less than one foot in width, contain very little mineralization and do not persist over the bluff. HW #3 vein is the most persistent quartz vein exposed in the area. It was traced intermittently for a length of 900 feet, with both ends being lost in talus slopes. The vein averages 1.5 feet in width but is very sparsely and sporadically mineralized with bornite and chalcopyrite.

Approximately 200 feet south of the main adit vein, there are three flat quartz veins, striking north-south and dipping 10° - 20° west. The centre vein is of interest in that in one local area, 4 feet long, it is heavily mineralized in molybdenite, bornite and chalcopyrite. The vein was traced northward for 80 feet but no other significant mineralized zones were noted.

The third group of quartz veins of economic interest are situated on the saddle north and north-east of Slippery Lake. The two most northerly veins shown on the geological map, figure 1, had been trenched at one time or another. These trenches were partially reopened and the veins stripped of overburden along the strike. The lower trench could not be exposed due to heavy snow, but material from the vein was found nearby and examined. Chalcocite and bornite were the major copper bearing minerals. The upper vein was exposed intermittently for 700 feet. The main part of the vein averages 8" - 10" in width for a length of 125 feet, and is sporadically mineralized with bornite, cuprite and chalcopyrite. Copper mineral content does not exceed 10%.

Muscovite Granite

The prime concern at this time was to examine the "mineralized" muscovite granite as shown on figure 1. The mineralization in the granite was not extensive and at no

place did it exceed 10 percent. The primary mineralization included pyrite, chalcopyrite and minor amounts of bornite (?). Secondary malachite and azurite were also noted.

Five samples at various horizons were taken with the following results:-

Sample No.	Visual Sulphide Content	Copper (Cu) %	Total Molybdenum (Mo) %
#1	6 percent	0.05	0.01
#2	7 "	0.18	0.01
#3	5 "	0.18	0.01
#4	5 "	0.21	0.01
#5	1 "	Trace	Trace

These results are representative of various horizons near and away from the quartz veins. Samples number 2, 3 and 4 were in close proximity to the main vein.

Conclusions

The main adit vein is the best mineralized in the area and also the widest vein. The mineralization in these quartz veins is very erratic with no significant ore shoots being apparent. Local concentration of mineralization is spectacular, but lack of length and width coupled with low metal value in the veins makes this deposit uneconomic at this time. The low copper content of the mineralized muscovite granite only serves to lower the economic possibilities.

The quartz veins are definitely of the fissure type and are closely associated with the muscovite granite intrusion in time and mineralization.

W. Leszczyszyn

(W. Leszczyszyn).

WL:md
Vancouver, B.C.
August 23rd, 1965.

STATEMENT OF QUALIFICATIONS

Qualification

B.Sc. degree, 1959, Honours Geology,
University of Western Ontario,
London, Ontario.

Training and Experience

1957 to 1959 - Summer employment with the Ontario Department of Mines as Junior and Senior Geological Assistant in field mapping.

1959 to 1961 - Development and Stope Geologist, International Nickel Co., Thompson, Manitoba.

1961 to 1964 - Mine Geologist, Farley Shaft, Sherritt Gordon Mines Ltd., Lynn Lake, Manitoba.

1964 to date - Mine Geologist, Bralorne Pioneer Mines Limited, Bralorne, B.C.

(W. Leszczyszyn).

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
TO WIT:

In the Matter of Assessment work on the Zel group of mineral claims

I, James Peter Weeks

of 1285 Bracknell Place, North Vancouver, B.C.

in the Province of British Columbia, do solemnly declare that

the following Statement of Expenditures is correct:

Name	Occupation	Dates	Remuneration
P. Weeks, P.Eng.	Chief Geologist	16th and 23rd July 2 days	$108
W. Leszczyszyn, B.Sc.	Geologist	12th to 27th July, inclusive: 14 days	$546
E. Eadie	Prospector	16th to 23rd July, inclusive: 8 days	$160
R. Osterhout	Geological Assistant	14th to 23rd July, inclusive: 10 days	$200
M. Beaulne	Prospectors "	16th to 23rd July, inclusive: 8 days	$195
			$1,209

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 30 day of August, 1965, A.D.

Jas P. Weeks

Shirley Jeannotte

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

Sub-mining Recorder

NOTE:

The area covered by the claims contains a very large proportion of outcrop. To attempt to indicate the position of individual outcrops upon which the geological mapping was based would result in confusion. Generally it may be stated that with the following areas excepted, outcrops represent some 70% of the surface area.

1. Smithe and Slippery Lakes.
2. The slope towards Slippery Lake and on the west side of the lake on Zel No. 6 claim which supports a growth of timber.
3. The slope towards Slippery Lake and on the north side of the lake near the boundary of Zel Nos. 5 and 6 claims largely covered by Talus.
4. Snow patches, mainly on Zel No. 5 claim in the saddle between the two peaks.
5. The slope South West of Smithe Lake which is largely covered by snow and Talus.

123°28'

123°27'

49°43'

49°42'

5000

4500

4000

ZEL 7

ZEL 5

ZEL 8

ZEL 6

ZEL 3

ZEL 4

ZEL 1

ZEL 2

SLIPPERY LAKE

SMITHE LAKE

MT DONALDSON

5512

Hornblende Diorite

Limit of Area Mapped

LEGEND

- Defined / Approximate / Assumed — GEOLOGICAL BOUNDARY
- QUARTZ BIOTITE GRANITE
- MUSCOVITE GRANITE
- HYBRID GRANITE
- RHYOLITE DIKE
- QUARTZ VEIN
- QUARTZ MASS
- ADIT
- CLAIM POST (Approximate)
- CLAIM BOUNDARY (Approximate)
- P PIT
- T TRENCH

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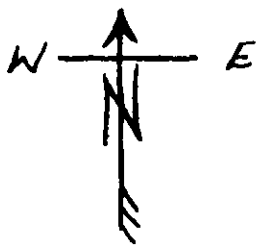
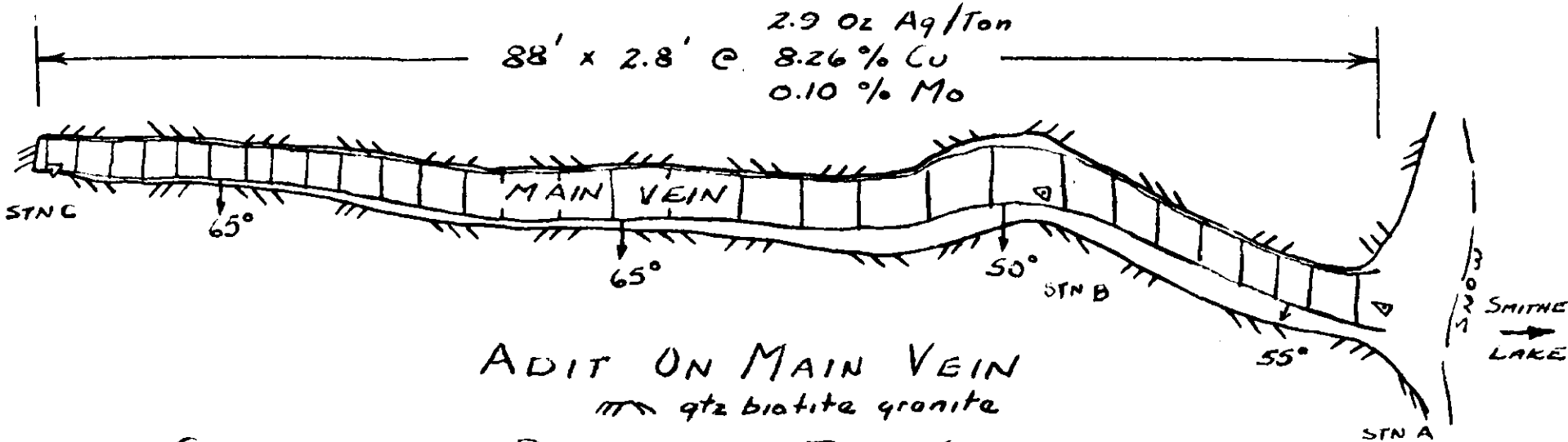
Fig. 1

GEOLOGICAL MAP, ZEL GROUP
MT. DONALDSON B.C. 49°30' 123° NW
JULY 30, 1965 BY W. LESZCZYSZYN
To accompany geological report on the ZEL Group

SCALE 1"=600'	REF.	
DRAWN BY	DATE	No.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 752 MAP #2



ADIT ON MAIN VEIN

qtz biotite granite

GEOLOGICAL PLAN ZEL GROUP

MT DONALDSON B.C. 49°30' - 123 N.W.

JULY 30, 1965 1" = 10'

BY W. LESZCZYSZYN B.Sc.

W. Leszczyszyn

To accompany geological report on ZEL GROUP

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Fig 2

GEOLOGICAL PROFILE ZEL GROUP

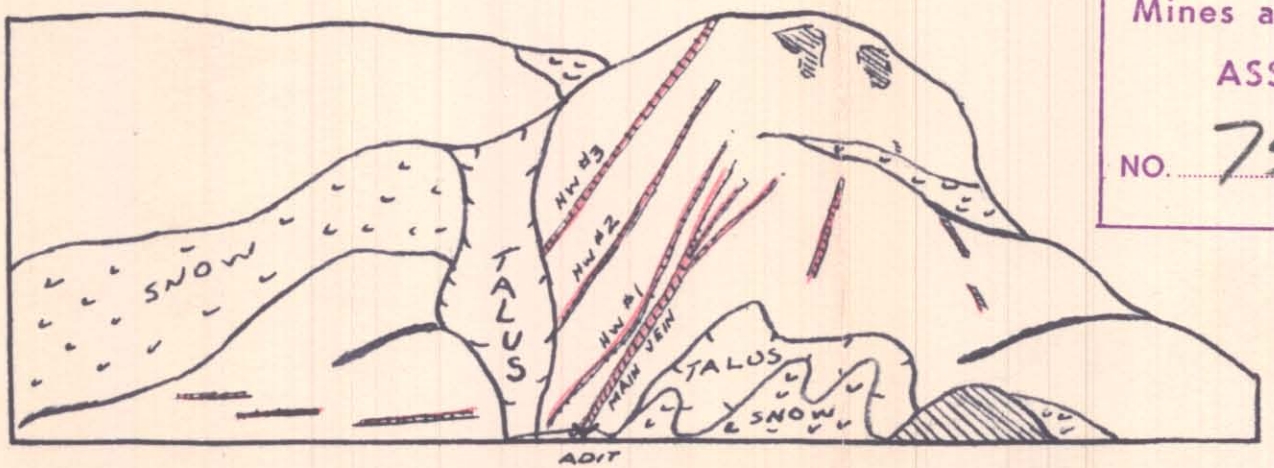
MT DONALDSON B.C. 49°30' 123° NW

JULY 30, 1965 1"=200'

BY W. LESZCZYSZYN BSc

W. Leszczyszyn

To accompany geological report on ZEL GROUP



ELEVATION 4600' LAKE LEVEL
ABOVE SEA LEVEL

SMITHE LAKE

LOOKING AT 305° AZ. FROM INITIAL POST

Scale 1"=200' (Vertical & Horizontal)

quartz vein

quartz

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Fig. 3