



**TASEKO LAKES AREA  
(920)**

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**GRANITE CREEK PROPERTY (920/3W)**

The Granite Creek property was studied and diamond drilled by Quintana Minerals Corporation in 1976. Work was directed by K. W. Livingstone and W. A. Howell.

Diamond drilling, predominantly in the vicinity of the Empress showing, was conducted as a follow-up to earlier percussion drilling, both by Quintana and other companies. The general geology and locations of the mineral deposits described are shown on Figure 11.

Granite Creek is a tributary of Taseko River east of the south end of Taseko Lakes. Copper and minor molybdenum mineralization occurs in both volcanic and plutonic host rocks on the property. The northern contact of a large body of granodiorite runs approximately eastward across the property. Volcanic rocks near the contact are variably altered; the more intensely altered areas form colourful brown, red, and yellow gossans. It is not certain whether the alteration zones relate to granitic emplacement or are volcanic phenomena. Mineralization occurs in sericitized and silicified zones in both the volcanic and plutonic rocks. In the granodiorite mineralization is either disseminated or in shattered and brecciated zones and is generally close to its borders.

Hydrothermal alteration of the volcanic rocks is obviously fracture controlled. Altered zones are typically rusty weathering due to pyrite which was added to the country rock while it was being variably sericitized, bleached, and silicified. Chlorite and epidote alteration and specularite, chalcopyrite, magnetite mineralization accompanied the alteration. Some alunite (Livingstone, personal communication) was deposited. The altered zone affects roughly 150 metres of section. Where they are recognizable, rocks in this zone are massive to porphyritic andesitic flows and fine to coarse volcaniclastic rocks.

**DEPOSITS IN THE GRANODIORITE**

**(A) Buzzer Showing**

Mineralization at Buzzer forms a subequant zone in variably altered porphyritic granodiorite. The country rock is vuggy and sulphides, quartz, flaky sericite, and rarely tremolite line the vugs. The country rock is distinctly porphyritic at the main open cut but gradually gives way northward to grey, slightly porphyritic granodiorite. The size and percentage of phenocrysts in the rock varies. Consequently, unless there is an appropriate weathered face, the porphyritic nature of the rock is not always obvious.

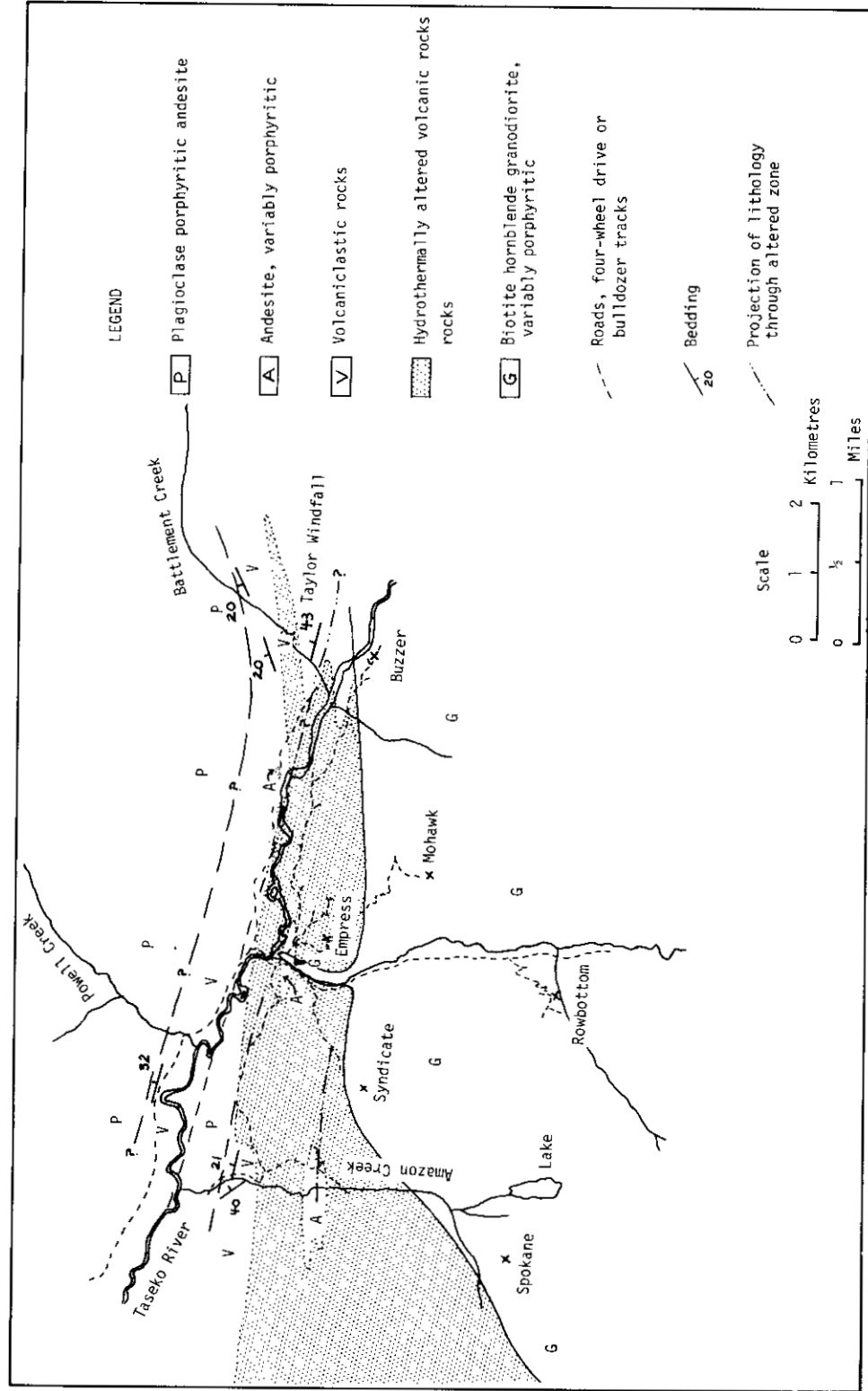


Figure 11. Generalized geology of Granite Creek property.

In mineralized areas the country rocks may be relatively fresh or altered. Relatively fresh rocks look grey whereas the altered rocks are pink. Mafic minerals in both types are pervasively chloritized. Mineralization occurs in vugs in the country rock and the size and percentage of vugs increase in more altered zones. However, grade is not necessarily better in more altered zones because chalcopyrite is the predominant mineral in vugs in 'fresh' zones but flaky sericite and quartz are more abundant than chalcopyrite in vugs in 'altered' zones. Molybdenite occurs locally. The pink altered zones trend 060 to 070 degrees and are probably fracture controlled. Oxidation is minor but some malachite occurs. The overall control which localizes mineralization is obscure. It appears, however, that the granitic rocks were high level intrusions and that mineralization occurred in gas cavities in volatile-rich areas.

Tonnage potential for the deposit can be roughly estimated. The deposit is circular, 200 metres in diameter, and has been drilled to about 100 metres in depth (Woodsworth, Pearson, and Sinclair, 1976). Thus tonnage potential is about 10 million tonnes but, judging from surface exposures, grades are subeconomic.

**(B) Rowbottom Showing**

Mineralization in the Rowbottom showing (Fig. 11) closely resembles that at the Buzzer showing with the exception that pyrrhotite is a minor accessory. Mineralization is in vugs and replaces chloritized mafic minerals in variably altered porphyritic granodiorite. At Rowbottom it is more obvious that copper abundance is not correlated closely with alteration intensity. In more altered zones at Rowbottom the rock is pinker, fractures are rusty, vugs range to 10 per cent by volume, and the vugs are rusty weathering. Vugs are rounded to elliptical in outline and range to 1.25 centimetres by 2.5 centimetres. Generally in the mineralized zone feldspar is mildly sericitized and pink to yellow-green in colour and mafics are completely chloritized. Local epidote alteration was noted in drill core. In this deposit plagioclase phenocrysts are medium to coarse grained, mafic phenocrysts are coarse grained and range from 15 to 20 per cent, and there are a few per cent medium-grained quartz phenocrysts. The matrix is a finely crystalline mixture of quartz, mafics, and feldspar.

Away from the main showing, the rock is less obviously porphyritic and alteration decreases. Mafics are seen to be biotite and hornblende in roughly equal abundance. Sulphides continue to be present but pyrite rather than chalcopyrite predominates.

In drill core, the country rock granodiorite is cut by barren, locally epidotized, porphyritic dykes. The dykes have hornblende (8 per cent) and plagioclase (15 per cent) phenocrysts in a finely crystalline grey matrix. These dykes are probably of post-mineral age.

No estimate of tonnage potential is possible with available data but the zone is apparently smaller than the Buzzer showing with roughly the same grades.

**(C) Mohawk Showing**

Mineralization at Mohawk is largely confined to a zone of almost monomictic breccia. Breccia fragments consist predominantly of hematite-speckled, finely crystalline leucocratic 'aplite,' although rare granodiorite clasts occur (Wolfhard, personal communication). Most fragments are from fist to boulder sized and many are rounded. The fragments are not strongly altered but the breccia matrix is veined by and infilled with quartz, flaky sericite, and sulphides. Although the breccia body is irregular in detail, it can be traced northeasterly across the hillside. An adit, which is now caved, was driven by Cominco in 1928 and extended by Motherlode Gold Mines Ltd. between 1933 and 1935 (*Minister of Mines, B.C., Ann. Rept., 1935*). It intersected the breccia and confirmed the impression that the body dips steeply southeastward. Along strike to the northeast, the breccia zone narrows rapidly, while to the southwest there is no exposure. At its maximum, the zone is roughly 25 metres wide. In the underground working, where the footwall is reported to be marked by a 1-metre-wide gouge zone, mineralization is weak and confined to a 10-metre-wide zone adjacent to it (*Minister of Mines, B.C., Ann. Rept., 1935, p. F24*).

Mineralization occurs as disseminations in the sericitic matrix of the breccia and with quartz in veinlets. Chalcopyrite is the predominant sulphide and is reported to carry significant gold and weak silver values. Lesser molybdenite and minor galena and sphalerite occur. Small amounts of tourmaline and rutile have been reported and calcite-fluorapatite veinlets were found in the adit dump.

Quartz veins occur throughout the breccia but are most abundant adjacent to the hangingwall. They tend to be vuggy, locally have crystals to 3 centimetres in length, and may carry chalcopyrite, pyrite, disseminated or rosettes of molybdenite, galena, or sphalerite. Molybdenite and galena appear to be more abundant near the hangingwall. Some quartz veins have coarse-grained sericite envelopes, some have flaky sericite in vugs. Molybdenite rosettes are usually rimmed by pale brown micaceous-looking powellite. Chalcopyrite also occurs as disseminations in the quartz-flaky sericite-rich breccia matrix. In outcrop, weathering has produced local malachite staining.

*Country Rock*

The country rock of the Mohawk showing changes from even grained to porphyritic and from biotite granodiorite to biotite quartz monzonite. The textural variations apparently reflect local conditions of crystallization rather than multiple intrusions because porphyritic and even grained varieties have gradational boundaries.

Furthermore, biotite and plagioclase which are phenocrysts in the porphyritic rocks are also early formed components in those which are even grained. K-feldspar and quartz are late, interstitial components.

East of the showing the granitic country rock is cut by medium to dark grey, fine-grained to porphyritic dykes. Phenocrysts, where present, are biotite and plagioclase. One finely crystalline dyke had calcite amygdules.

Adjacent to the mineralized zone, the footwall country rock displays a narrow zone with weak argillic alteration of plagioclase and chloritization of biotite. The hangingwall alteration halo is also narrow but is more intense. In it, plagioclase is altered to a pink-coloured mixture of sericite + carbonate + hematite ? and biotite is sericitized. Pink rims occur locally on altered plagioclase crystals along the footwall within a metre or so of the zone (Wolfhard, personal communication).

#### *Reserve Potential*

Insufficient data is available to estimate reserves for the showing. Assay results from the 1935 Annual Report of the Minister of Mines (p. F24) suggest that grades at surface will average about 4.68 grams per tonne (0.15 ounce per ton) gold over 20 metres with copper near 0.75 per cent. Grades worsen and the zone narrows with depth. Reserve potential of the known zone to a depth of 30 metres is roughly 150 000 tonnes; grades would likely be well below the above figures.

#### **(D) Spokane Showing**

Mineralization at Spokane is in veins, in shear zones, and along altered fractures in biotite hornblende granodiorite. In the area of the workings, the country rock is cut by pre-mineral aplite and alaskite dykes. Often the dykes are altered and locally they are heavily pyritized. Basaltic post-mineral dykes have glassy quartz amygdules set in a finely crystalline matrix shot through with plagioclase microlites. Xenoliths are fairly common in the granodiorite. Most are medium grained, grey, and partly assimilated and some are amphibolites. Almost all the xenoliths are less than 15 centimetres across.

Sulphides occur both as disseminations in altered country rock and pre-mineral dykes and in veins. Most of the disseminated sulphide is pyrite but chalcopyrite is a prominent vein mineral. Usually hematized plagioclase causes granodiorite adjacent to veins to be pink coloured and mafic minerals are pervasively chloritized. Vein walls are lined with quartz crystals and sulphides fill vein cores. Apatite occurs locally as a vein accessory. Chalcopyrite and pyrite predominate in the veins and rare scheelite occurs. Chalcopyrite and pyrite also occur in pockets of quartz-sericite alteration along pink-altered fractures. The best mineralized veins on the property strike northeast or southeast and are steeply inclined. In weathered

surface exposures, primary sulphides have been partially altered to malachite and chrysocolla. Pyrite-rich areas are rusty weathering and country rock in them tends to be bleached to a pale grey colour.

It is not possible to accurately assess the reserve potential of this deposit from surface exposures and available data. According to early assay reports, gold is present along with the copper but best values were in leached, oxidized granodiorite rather than with chalcopyrite. Potential appears to be only a few million tonnes with values in copper and gold.

## DEPOSITS IN THE VOLCANIC ROCKS

### (A) Empress

Rocks at the Empress showing are pervasively altered. Judging from regional relationships the country rocks are a mixed assemblage of massive to porphyritic andesitic flows, and variably fine to coarse-grained thick-bedded fragmental volcanic rocks. At Empress, bleaching, pervasive silicification, and sericitic alteration were accompanied by formation of pyrite, chalcopyrite, and magnetite. Alteration intensity and type vary as do amounts and proportions of magnetite and sulphides. Both in trenches and in drill core variations in magnetite content impart lighter and darker colour banding and a foliation to the rock. The foliation typically dips 40 to 50 degrees and may represent relict bedding.

Silicification is more intense at Empress than elsewhere in the hydrothermally altered area adjacent to the granodiorite contact (Fig. 11) along Taseko River. In places the rock now consists primarily of granular quartz with disseminated magnetite and sulphides. Sericitic alteration is expressed as pale pink or green alteration of feldspars and as disseminated pockets and veinlets of flaky sericite. Where the flaky sericite is disseminated it generally accompanies magnetite, quartz, sulphides, and often feldspar. Specularite rather than magnetite and chlorite is locally present and occurs in pockets and veinlets where it is often joined by quartz and sulphides.

Magnetite is predominantly disseminated but at the original Empress showing it forms irregular patches and massive zones in a strongly silicified outcrop. Sulphides are predominantly pyrite and chalcopyrite but there are minor amounts of molybdenite and pyrrhotite. Sulphides occur as disseminations, in fractures, and in veins. Gangue minerals in fractures and veins include calcite, quartz, and chlorite.

Gypsum-coated fractures occur locally and are associated with soft green montmorillonite alteration zones. Some fractures are coated with white kaolinite.

Reserve potential at the Empress showing is uncertain.

## **(B) Taylor – Windfall**

The Taylor – Windfall workings are in altered volcanoclastic rocks where pockets and veins of quartz, tourmaline, and pyrite occur. Taylor – Windfall was not mapped but is well described in the Annual Report of the Minister of Mines for 1935. Apparently very fine to sponge gold was recovered in quartz, tourmaline, rutile, pyrite gangue in fracture-controlled pockets. *Other fine gold occurred in shoots with pyrite, tennantite, chalcopyrite, and some sphalerite, galena, and barite in sericite, chlorite gangue. Much of the gold was apparently disseminated in the chloritic gangue.*

## **REFERENCES**

*Minister of Mines, B.C., Ann. Rept., 1935, p. F24.*

Woodsworth, G. J., Pearson, D. E., and Sinclair, A. J. (1976): Metal distribution patterns across the eastern flank of the Coast Plutonic Complex, south central British Columbia, *Econ. Geol.*, in press.

## **FISH LAKE DEPOSIT (92O/5E)**

Results of work done on the Fish Lake deposit will be presented in *Geology in British Columbia, 1976*. Drill holes along east-west and north-south sections through the deposit were logged and core from each hole was checked at the 4600 level (or as close to that as possible) for overall geological data.

## **POISON MOUNTAIN (92O/2E)**

Several days were spent examining outcrops and drill core at the Poison Mountain copper deposit. An attempt will be made to radiometrically date the intrusive rocks on the property by K-Ar analysis.

## **ELDORADO MOUNTAIN (92O/2W)**

An attempt will also be made to date intrusive rocks from the Eldorado Mountain gold prospect which is being explored by Chevron Standard Limited. Two small vein deposits south of Eldorado Mountain were examined. In the dump from Lucky Strike adit, vein material consisted of arsenopyrite, sphalerite, jamesonite, some pyrite, and minor amounts of chalcopyrite. Quartz, calcite, and siderite (?) comprise the gangue. The country rock is variably serpentinite, porphyry dyke (?), or altered volcanic rock. Mineralization at Lucky Jem is similar but country rock appears to be bleached, altered argillites and sandstones. Both showings are described in the Annual Report of the Minister of Mines for 1933.