

Spec 109

103I/9w  
103I-45

018021

GROTTO GROUP

This group of 12 claims is owned by Joe Bell, Lee Bethurem and George Alger, of Usk. It is located in the valley of Hardscrabble creek about 1 mile westerly from the Canadian National Railway from a point on the railway 6 miles north-easterly of Usk and 1/2 mile south-westerly of Pitman station.

Accessibility:- From this point on the railway, at elevation 375 feet, a good pack-horse trail extends for 1 mile up the north side of Hardscrabble creek valley to the cabin at elevation 610 feet. The cabin is about 125 feet from and 30 feet above the creek. From the railway the trail follows a good wagon-road grade for about 1/4-mile but for the next 1/4-mile a very steep grade ascends to the top of a ridge at elevation 850 feet. From this point a fair grade descends the rockslide-covered southerly slope of the valley-confines, to the bench on which the cabin is located. For purposes of go-devilling the 1/4-mile stretch ascending the ridge to elevation 850 feet requires complete re-location and the last 1/2-mile descending the ridge to the cabin requires widening. The cost of this is estimated at about \$800.00. The owners ask only \$300.00. From Pitman station a wagon-road in fair condition extends for 3/4-quarters of a mile to the probable site of the re-located trail.

Topography:- Hardscrabble creek flows generally east and the valley in the vicinity of the showings is confined by 20 to 40 degree, densely-timbered slopes deeply covered by glacial clay and boulder overburden to at least 1,000 feet elevation. Occasional rock-ridges outcrop through the overburden along the slopes. Glaciated, "roche-moutonnee" rock-bluffs confine the creek itself along appreciable distances and

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in the creek-bottom bed-rock, forming frequent riffles and low falls, is generally exposed. Immediately below the cabin the creek enters a steep rock-walled gorge which continues downstream for about three-quarters of a mile and to about one-quarter of a mile from the railway, in the form of a rugged and deeply-incised canyon. At the mouth of the canyon the creek cuts its way for three-eighths of a mile through deep glacial boulder-moraine to its confluence with the Skeena river at elevation 350 feet.

The main showings are located along the rocky confines of both sides of the creek-bank between elevations 585 and 615 feet. A new discovery has been made at elevation 1010 feet on the steep mountain slope of the south bank.

Geology:- The locality is in the vicinity of the easterly-plunging easterly contact of the Coast Range granodiorite batholith. The area embraced by the claims is underlain by andesitic volcanic rocks intruded by granitic tongues satellite to the batholith and by both basic and acid dykes. The volcanic rocks are composed of apparently layered tuffs, breccias and flows striking north-westerly across the creek and dipping steeply south-westerly. Small shears and slips conformable to the trend and dip of the formation are characteristic. The veins strike generally north-easterly across the trend of the volcanic rocks and dip north-westerly. They occur in the andesitic rocks adjacent to their contact with the intrusive and sometimes in the intrusive itself.

Type of Deposit:- The main showings along the creek consist of quartz veins varying from a few inches to about 3.5 feet wide, occurring in

altered andesite and sometimes in porphyritic granodiorite along and adjacent to the contact of these two rocks. The veins are mineralized with pyrite, chalcopyrite, specularite and sparse sphalerite. They strike generally north-easterly and dip from 35 to 70 degrees north-westerly. Characteristic is a slight westerly bend of the strike for short distances along north-westerly striking slips and shears, followed by a readjustment back to the line of normal north-easterly strike. At these points, mineralization and vein-widths is generally increased and sometimes the slip is mineralized for short distances, forming a small branch-vein. This characteristic could be ascribed to incipient faulting or, where the vein follows a sheared contact between the intrusive and the volcanics, to an irregularity or slight swing of the contact.

A second type of deposit along the creek is discontinuous and reticulated tightly-frozen quartz stringers and patches from one-half to 12-inches in width, distributed across a width of 8 to 10 feet in andesitic or hybridized-andesitic volcanic rocks. These are very irregularly mineralized with patches of massive chalcopyrite from about 1 to 6 inches in diameter.

A third type of deposit, occurring at elevation 1010 feet is disseminated chalcopyrite in a highly siliceous and cherty rock, possibly silicified tuff or arenaceous sediment.

Showings and workings:- Along the northerly bank of the creek and about 150 feet south-east of the cabin, a quartz vein 1 to 2.7 feet wide, striking north-easterly and dipping 35 to 50 degrees north-westerly, outcrops on and adjacent to the contact of porphyritic

granodiorite and andesite. It can be traced on the surface by natural outcrop, by an adit-portal and by an open-cut for a distance of 84 feet in a north-easterly direction from the creek. In a caved stripping in deep glacial debris, 20 feet north-easterly of the open-cut and at 5 feet lower elevation, the owner reports intersecting the vein showing good mineralization and vein-material typical of the deposit is seen on the dump. About 33 feet north-easterly of this stripping and at about 5 feet lower elevation in an old caved open-cut and adit in deep glacial debris adjacent to the creek, about which there is no accurate history, some typical vein-material on the dump leads to the supposition that the vein was also located in this working. In the 84 feet of definite tracing, about 30 feet of the vein-structure at its south-westerly end extending to the creek consists of an unmineralized fissure 4 to 8 inches wide.

At elevation 590 feet and about 150 feet south 47 degrees east from the cabin an open-cut 15 feet long and 8 feet deep has been excavated in glacial debris. The vein, 1.5 to 2.7 feet wide, striking north 35 degrees east and dipping 35 degrees north-westerly is exposed on the floor of the cut. The hanging-wall is andesite and the foot-wall is porphyritic granodiorite. The vein is well-mineralized with massive aggregates of pyrite and chalcopyrite associated sometimes with specularite and very sparse sphalerite. A sample (2758-B) across the vein for a width of 40 inches in the centre of this cut, and 29 feet north-east of the adit, assayed:- Gold, 0.10 ounces per ton; Silver, 15.0 ounces per ton; Copper, 0.8 per cent.; A sample

(2759-B) across a vein-width of 40 inches in the cut, and 24 feet north-east of the adit, assayed: Gold, 0.11 ounces per ton; Silver, 8.0 ounces per ton; Copper, 0.6 per cent. A dump of vein-material 18 cubic feet in volume, which calculated at 12 cubic feet to the ton, represents 1.5 tons, has been accumulated at this cut. A representative sample (2760-B) of this assayed: Gold, 0.30 ounces per ton; Silver, 25.0 ounces per ton; Copper, 3.6 per cent. insoluble, 51.0 per cent. A selected sample (2761-B) of specularite from a small pile by the cut, assayed: Gold, 0.20 ounces per ton; Silver, 25.0 ounces per ton;

At elevation 575 feet, 24 feet south 54 degrees west from this open-cut, the vein outcrops down the 12-foot high face of a bluff. It strikes north 54 degrees east and dips 40 degrees north-westerly. The hanging-wall of the vein is andesite and the foot-wall is porphyritic granodiorite and it is well-mineralized across a width of from 1 to 2 feet up the bluff-face. An adit, at elevation 575 feet on the floor has been driven on this exposure. In the roof at the portal the vein is 13 inches wide and well-mineralized with pyrite, chalcopyrite and some specularite. A sample (2763-B) of the vein at the portal, across 13 inches, assayed: Gold, 0.18 ounces per ton; Silver, 5.6 ounces per ton; Copper, 1.4 per cent. The adit is driven for 20 feet along a bearing of north 40 degrees east, angling slightly across the vein. Along this stretch the vein is well-mineralized across widths of from 1 to 3.8 feet, the hanging-wall being andesite and the foot-wall porphyritic granodiorite. At 22 feet from the portal a shear 1.5 feet wide striking north 5 degrees west and dipping 60 degrees

westerly cuts across the adit. The vein continues through this shear striking north 50 degrees east and is well-mineralized across a width of 3.5 feet for 2 feet beyond the shear and 24 feet from the portal. It is followed beyond the shear by an east drift for 26 feet at which point the drift bears north 28 degrees east. Along 24 feet of this stretch the vein is crushed, averages 1.5 feet in width in the roof, is very sparsely mineralized and has porphyritic granodiorite on the hanging-wall, with andesite on the foot-wall. Beyond the shear the vein appears to be faulted between the roof and floor of the drift by a flat structure striking north 30 degrees east and dipping from 10 to 20 degrees north-westerly. This comes in halfway up the east side of the drift and dips into about the floor of the west side. This fault does not appear to penetrate the shear cutting across the drift 22 feet from the portal, in which case the well-mineralized section of the vein 24 feet long between the portal and the shear would not be affected by the flat fault. Beyond the muck-pile the owner reports having driven the drift a further 8 or 10 feet with the vein showing a sparsely mineralized width of about 12 inches above the flat fault.

At 22 feet from the portal a branch vein on the east side of the shear follows the westerly contact of the porphyritic granodiorite wedge. This is followed in the west drift along a bearing of between north 45 and 47 degrees east for a distance of 26 feet at which point the fracture angles acutely into the west wall of the drift. For the first 10 feet of this length this branch-vein contains a width of 8 to 12 inches of fair chalcopyrite and pyrite mineralization in a quartz gangue. Beyond this, to its point of entry into the west adit-wall, the fracture pinches to a width of from 1 to 2 inches and is not

mineralized.

The west drift continues along the contact on a bearing of north 45 degrees east, with porphyritic granodiorite on the east wall and andesite on the west wall, the contact being coincident with a shear-plane 12 inches wide striking north 20 degrees east and dipping 60 degrees north-westerly. A shear in the east wall of the adit strikes north 83 degrees east and dips 40 degrees south. This comes up from the floor and is cut off in the roof by the shear along the contact at a point in the west drift 73 feet from the portal. At a point in the west drift, 55 feet from the portal, a crosscut extends into the porphyritic granodiorite of the east wall. This is filled with muck but is reported by the owner to have intersected the east drift and main vein in a distance of 7 feet, the vein being on the contact of porphyritic granodiorite and andesite and still exhibiting the irregular, crushed and sparsely-mineralized character above the flat fault previously described.

At a point 73 feet from the portal the west drift turns into the porphyritic granodiorite along a bearing of north 83 degrees east and at 88 feet from the portal intersects what is probably the main vein on the east contact of the porphyritic granodiorite wedge. Due probably to the proximity of the flat fault below the floor of the drift, the vein here is crushed and disturbed but is well-mineralized with pyrite, chalcopyrite and specularite across a width of 3.2 feet. It strikes north 50 degrees east, dips from 60 to 70 degrees north-westerly and conforms in attitude to the granodiorite-andesite contact. This is followed for 18 feet to the face showing

a continuing width of 1 to 1.5 feet in the roof with fair mineralization. The last 10 feet of the drift turns slightly across the vein to a ~~N~~ bearing of north 73 degrees east, with the vein in the face sparsely mineralized across a width of 10 inches, striking north 50 degrees east and dipping 70 degrees north-westerly into the north-westerly corner of the face. About 10 feet back from the face an unmineralized shear 6 inches wide, striking north 10 degrees east and dipping 60 degrees westerly cuts at an acute angle through the vein.

It should be noted that both the east and west drifts in this adit, commencing at 22 feet from the portal, are practically on or just slightly above the flat fault described in the east drift. The face of the west drift, a total of 106 feet north-westerly of the portal, is roughly less than 20 feet northerly of the old, caved adit. The back above the adit-roof is consequently not more than 10 to 15 feet thick at any place, which, allowing for an average thickness of 6 feet of glacial debris and soil on top, leaves a maximum back of only about 9 feet of rock or vein above the adit-roof or about 15.5 feet above the adit-floor. With the flat fault indicated as being on, or very slightly below, the adit-floor, a maximum thickness of only about 9 feet of possible vein-back, is indicated as possible above the adit-roof along the total known length of vein surface-tracing.



The following samples were taken in this adit:

	Gold Oz. per ton.	Silver Oz. per ton	Copper %	Insoluble %
2763-B Across 13 inches at portal	0.18	5.6	1.4	
2764-B Across 2.75 feet, 8 feet in from portal	0.36	13.5	1.6	
2765-B Across 15 inches, 13 feet in from portal	0.16	7.5	2.1	
2766-B Across 3.5 feet, 24 feet in from portal (E. drift)	0.16	7.5	1.0	
2767-B W. drift, across 3.5 feet, 18 feet from face	0.20	31.2	1.4	
2768-B W. drift, across 15 inches at face	0.04	2.2	0.3	

At the adit-portal a dump of vein-material having a volume of 135 cubic feet, equivalent to 11½ tons, has been accumulated. The owner reports that this is about half of what was originally accumulated the rest having been lost by high-water in the creek. A representative sample of this dump assayed: Gold, 0.20 ounces per ton; Silver, 12.0 ounces per ton; Copper, 1.0 per cent; Insoluble, 73.3 per cent.

At elevation 590 feet, about 300 feet south 63 degrees west from the adit and on the opposite or southerly side of the creek, a quartz vein outcrops in altered andesite on the edge of the creek.

It can be traced for about 20 feet on the bluff-face bordering the creek to about 10 feet above the present water-level, striking north 48 degrees east and dipping 70 degrees north-westerly. Further possible continuity up the hill is obscured by thick timber and heavy overburden. It varies from 6 to 12 inches in width, with free walls, and is well-mineralized with massive aggregates of pyrite and chalcopryrite associated with some specularite. In the bluff-face at elevation 600 feet and 20 feet from the creek, an adit is driven along a bearing of south 45 degrees west, into the 38-degree hill-slope and angling slightly across the vein, for a distance of 21 feet. For 14 feet of this distance the vein-width varies from 12 inches at the portal to 2 inches at 7 feet from the face. For the last 7 feet to the face it pinches and disperses in a disturbed area and at the face is cut off by a defined fault, striking north 45 degrees west and dipping 75 degrees south-westerly. A sample of selected mineralization from the length of 14 feet in the adit and the surface exposure on the bank of the creek taken from vein-widths varying from 2 to 12 inches, assayed: Gold, 0.6 ounces; Silver, 2.2 ounces per ton; Copper, 0.3 per cent. (#2768-B)?

On the northerly side of the creek-bed at elevation 605 feet and about 100 feet north 15 degrees west from the last-described adit, a series of tightly-frozen lenticular and discontinuous reticulated quartz stringers and patches, from one-half to 12 inches wide, occur in granitically-hybridized andesite. These are distributed across a width of about 10 feet and a length of about 40 feet and strike north 72 degrees east. They are very irregularly mineralized with widely-separated massive patches and blebs of chalcopryrite

from one-half to 8 inches in diameter.

At elevation 615 feet on the southerly side of the creek-bed and about 300 feet westerly from this a similar showing occurs. In this, however, the quartz stringers strike south 80 degrees east. A composite sample (#2771-B) of selected chalcopyrite from these two showings, assayed: Gold, 1.94 ounces per ton; Silver, 13.0 ounces per ton; Copper, 18.4 per cent.

At elevation 1010 feet on the southerly side of the creek, and about 700 feet south 25 degrees east from the same, an open-cut 10 feet long through overburden on the 36-degree hill-slope, discloses disseminated chalcopyrite in a highly silicified, cherty rock. The rock is appreciably shattered and characterized by major jointing striking north 40 degrees west and dipping 42 degrees north-easterly, with minor jointing striking north 80 degrees east and dipping 50 to 70 degrees north-westerly. Chalcopyrite in fine dissemination, accompanied by some pyrite is fairly evenly distributed through the cherty rock. The occurrence has not been traced and no definite walls are exposed, so that the attitude of the occurrence can not be determined. A representative chip-sample of the open-cut (sample 2769-B) over a length of 10 feet and a width of 5 feet, assayed: Gold, trace; Silver, 0.4 ounces per ton; Copper, 0.4 per cent.

Cost of Transportation:— Cost of go-devilling from the main adit at elevation 575 feet to the top of the ridge at elevation 850 feet for a distance of one-half mile, using 1 man, 1 go-devil and 1 horse, with one-half-ton per load and 8 trips per day, equivalent to 4 tons per day for this stretch, is estimated to cost a total of \$6.00 or ~~\$1.50~~ 1.50 per ton. ~~From the top of the ridge to Pitman station, a distance of~~

From the top of the ridge to Pitman station, a distance of about three-quarters of a mile, using a narrow wagon, 1 man and 2 horses, and making 6 trips per day with  $1\frac{1}{2}$  tons per trip or a total of 9 tons, is estimated to cost a total of \$8.00 or about \$1.00 per ton. On this basis total cost of transportation from the workings to Pitman station is estimated at \$2.50 per ton.

This is dependent upon an estimated expenditure of about \$800.00 (the owners have asked for only \$300.00) on the relocation and widening of the trail, in which the owners should be expected to participate in part.

Ore now available for shipment:- 12.75 tons in two dumps, as described, and dependent on values indicated by assays of samples.

Future possibility of ore-shipments:- On the main vein in the back between the adit-portal and the open-cut, for a length of 24 feet, an average back of 6.5 feet and a width of 2 feet, a probable 34.7 tons of good mineralization is indicated. This could be easily mined to the main adit-level and, dependent on assay results might constitute, or be cobbled to, a shipping-grade.

In the length of 18 feet at the face of the west drift, estimating an average back of 6.5 feet and an average vein-width of 2 feet carrying good mineralization, a possible 26 tons is indicated, which, dependent on assay results and the assumption of continuation in the back of the adit might constitute, or be cobbled to, shipping-grade.

At the location of the adit on the south side of the creek, 300 feet south-westerly of the main adit, a possibility for mining shipping-grade ore exists in a block along the adit-floor 14

feet long and extending for a further 15 feet to 5 feet up from the creek. Estimating an average well-mineralized vein-width of 8 inches for a length of 29 feet and a depth of 5 feet gives a volume of 96.6 cubic feet, equivalent to 10.7 tons.

In the roof of this adit for a base-length of 14 feet and a maximum height of about 10 feet, a triangular block exists containing a possible well-mineralized average vein-width of 7 inches. This is equivalent to a volume of 41 cubic feet or 4.5 tons.

In these 4 blocks at 2 localities, is a total of 34.7 probable tons, plus a total of 41.3 possible tons, or a total of 75.9 tons of both classes, which could be easily mined and, dependent on assay values, might constitute, or be cobbled to, a shipping-grade ore.

signed (Joseph T. Mandy)

(D. Lay)

Resident Mining Engineers.

Usk, B.C.

May 31st, 1937.