McVICAR COPPER-ZINC DEPOSIT,

RAFFUSE CREEK

SQUAMISH, B. C.

V. DOLMAGE 1947

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McVICAR COPPER-ZINC DEPOSITS,
RAFFUSE CREEK, SQUAMISH, B.C.

The McVicar copper-zinc deposits are situated along the western side of Goat or Raffuse creek which flows in a northerly direction to join the Mamquam River, 6 miles east of its entrance into the head of Howe Sound near the port of Squamish. The claims are 25 miles almost due north of Vancouver. They are about 8 miles from the nearest workings of the Britannia mine of the Howe Sound Co.

The camp on the McVicar property is reached by logging road and trail from the seaport of Squamish. The road is about 6 miles and the trail about 5 miles in length. The trail is used by pack horses. The camp is 2500 feet above sea level but some of the showings are as high as 4000 feet.

The valley of Raffuse creek is very deep and the valley walls steep. Up to 3000 feet they are covered by a dense forest of giant cedar, hemlock and fir trees, but above this elevation the trees become smaller and more widely spaced with many open alpine meadows.

The deposits consist of wide shears in greenstone. The shears are intensely silicified and mineralized with iron, copper, zinc and lead sulphides. A very limited amount of surface stripping has exposed some impressive showings of copper-zinc ore

distributed at irregular intervals for a mile or more along a band of greenstone 2000 to 3000 feet wide, more or less sheared throughout. The greenstone is part of a large inclusion of volcanic and sedimentary rocks in the Coast Range Batholith.

The claims are owned by the Surf Inlet Consolidated Gold Mines Ltd. of Vancouver. This company has actively prospected the ground during the last two summers. Some of the old showings were enlarged by surface stripping, new showings have been found, a new camp constructed, an accurate survey made of all the showings and a small amount of tunneling done. During this summer the writer visited the property on four occasions in the capacity of consulting geologist and examined all the showings, both old and new. The present report is based on information obtained on those occassions and on information obtained from a number of reports by government engineers.

The following reports on the property are available:

W. M. BREWER:	Ann. Report, B.C. Minister of Mines,	1925.
C.A. CLOTHIER:	Ann. Report, B.C. Minister of Mines,	1928, 1929 1930.
B.T. O'GRADY:	Ann. Report, B.C. Minister of Mines,	1937, Part F.

All of the above reports contain valuable information, particularly the one by O'Grady, who made a careful examination of the property and took a large number of samples.

Besides the above there is an excellent geological report on the Britannia area in which all the formations of the

general region are described in detail as well as the geological conditions under which the Britannia ore bodies occour. This report is by H.T. James and published by the Can. Geol. Survey in 1929 as Memoir 158.

The property now consists of 43 claims and fractions forming a solid block of ground one mile wide and extending along the west side of Raffuse Creek valley for 3.2 miles. Besides this, another group of 5 claims adjoining the above claims on the south have been optioned by the Surf Inlet company. This group is known as the Christina group and is owned by Basil Zubriggen, for many years an employee of the Surf Inlet company.

The Christina group was not examined by the writer and is not described in the present report. It is, however, fully described in O'Grady's report.

H I S T O R Y

The property now known as the McVicar is an amalgamation of three groups of claims staked in 1924 and 1925 by the three prospectors after whom the groups were named. These were McVicar, Manson and Brown. They were good prospectors and in a few months had uncovered a number of promising showings. The Britannia Mining & Smelting company immediately bonded the claims, packed in a diamond drill and bored a number of holes under the principal showings. After a brief period they relinquished their option. The prospectors continued their prospecting, discovering other promising showings. In 1928 Britannia Mining and Smelting

again optioned the claims. This time a geophysical survey was made, using the "radiore" methods and this followed up by further diamond drilling. Altogether about 3500 feet of drilling was done prior to 1929.

After the collapse of the copper prices in 1929 little or no work was done until 1937. In that year B. T. O'Grady of the B.C. Bureau of Mines made a complete examination of the property. Since then and until the Surf Inlet Consolidated company acquired an option on the property only sufficient work was done to meet the requirements of the annual assessment work.

In view of the prevailing high price of copper, the convenient location of the property and the possibility of finding on it large deposits of cop er comparable with those in the nearby Britannia mine, the Surf Inlet Company bonded the property in 1946 and resumed prospecting under the superintendency of Angus McLeod.

G E O L O G Y

The whole Pacific coast of British Columbia is largely occupied by the granite, granodiorite, and quartz diorite of a very large batholith known as the Coast Range batholith. It extends northward from Vancouver for more than 1000 miles and eastward from the coast for about 100 miles. It rises to a maximum of 13,000 feet above sea level and extends down to an unknown but very great depth. It is of Jurassic age. The older rocks into which it was intruded consisted of great thicknesses of volcanic rock, mainly andesite but containing also some

sedimentary rocks of which argillite is the most abundant. These older rocks were very largely displaced by the granitic rocks of the Batholith and are now found as scattered remnants or "inclusions" frozen in the batholithic. These inclusions vary in size from a few feet up to masses several miles in length.

The ore deposits of the region usually occur in or on the margins of the inclusions but some are found also along the margins of the main batholith, particularly the eastern margin.

There a few small areas of younger rocks, both sedimentary and volcanic lying on the batholithic and older rocks and among the most interesting of these are the very recent lavas and tuffs of the Mount Garibaldi district only a few miles north of the McVicar property. Garibaldi is an extinct but very recent volcano.

One of the largest of the ore deposits found in inclusions in the batholith is the one which constitutes the Britannia mine. This property has been a steady producer of copper-gold and zinc since the beginning of this century. It is still a large producer and has many years of life still ahead of it. The mill has a capacity of 6000 tons per day but in recent years, because of labor and other difficulties it has not been operated at maximum capacity.

The inclusion in which the Britannia mine is situated is 3 to 4 miles wide and 10 or more miles in length. It is probable that it extends northward down Raffuse creek and

so includes the McVicar deposits. In both areas the inclusion consists mainly of greenstone but there are also some argillite and coarse agglomerates. These rocks are intruded by dykes and sills. At Britannia there are many large sills of dacite and latite composition paralleling the ore bodies. No sills are found on the McVicar property.

In the higher and more westerly part of the McVicar property and particularly on the Giant No. 1 and Noonday claims was found a large lenticular body of coarse agglomerate. The fragments consist of light and dark colored lava in a dark matrix and grade from 1/4 of an inch up to several feet in length. This lense of tuff is 500 feet in width and 2000 or more feet long. Above these are more greenstone and argillite. These agglomerates serve to identify the formation as part of the Upper Goat Mountain formation of the Britannia area and referred to in Memoir 138.

Throughout the area covered by the Mc Vicar property the greenstone (altered andesite), is more or less sheared. The shearing has the same attitude as the bedding planes, that is a northwest strike and a steep dip usually to the west. In many places and over considerable areas the shearing is particularly intense. In these places its alteration to quartz and sericite is almost complete and large amounts of iron, copper and zinc sulphides have been added. Such areas constitute the ore bodies.

The size and the distribution of the principal ore

bodies so far found are indicated on the accompanying general plan of the workings drawn on a scale of 100 feet to the inch. The details of each of the ore bodies are shown on the smaller maps on a scale of 20 feet to the inch.

CHARACTERISTICS OF THE ORE DEPOSITS

The ore deposits on the McVicar property, while differing slightly from place to place, have, nevertheless, a number of common characteristics and these are common also to the Britannia deposits.

Structure

The deposits are limited to intensely sheared ground, the shearing being parallel or nearly so to the formations. There are a few exceptions in which the shearing strikes to the right of the normal regional strike.

Besides the shearing, fracturing is a common structural characteristic of most of the ore bodies, but is much more prominent in some than others. The fractures always strike across the shearing structures and very commonly the fractures are filled with pure chalcopyrite and consequently where fracturing is prevalent the grade of the ore is higher. This is illustrated in showing Rainstorm (3) where fractures up to two or three inches filled with chalcopyrite are numerous.

All the deposits so far found are shaped like large thick lenses, varying in width from 5 or 10 feet up to 150 feet and in length from 100 to 800.

All the deposits consist of greenstone which has

been extensively altered to quartz and sericite and impregnated with sulphides of iron, copper, zinc and lead. In many places the alteration of the rock to quartz and sericite is complete and in some places the quartz-sericite alteration extends out beyond the zone of sulphide impregnation. The alteration may therefore serve as a guide in looking for ore bodies and more careful mapping and testing may discover that separated bodies of ore are connected by zones or areas of alteration indicating a continuous channel for the ore solutions through numerous ore bodies.

The zinc and lead sulphides are much more abundant in the higher than in the lower showings as seen by a comparison of the assays in area (2) with those in area (5). The reason for this is not yet known but it may possibly have something to do with the process known as "zoning".

DESCRIPTION OF SHOWINGS

Lilly-Rose Showings, Area (1)

The Lilly-Rose showings are situated in the south-east corner of the property. The Lilly showings are detailed on plan "Lilly Area (1)" and the Rose showings lie about 400 feet nearly due north.

The Lilly showings expose a zone of mineralization 15 to 18 feet wide, from which the following samples were taken:

NO.	WIDTH	Au. Oz/Ton.	Ag. Oz/Ton.	Pb. %	Zn. %	Cu. %
O'Grady	4.5'	Tr.	1.0	-	-	0.9
"	4.5	Tr.	1.4	-	-	2.4
"	4.5	Tr.	1.8	-	-	6.6
"	4.5	Tr.	1.8	-	-	7.6
"	4.5	Tr.	1.2	-	-	5.8
M 11	10	-	-	-	-	0.7
M 10	18	-	-	-	0.9	2.5
M 13	17	-	-	-	Tr.	2.2
O'Grady	15	Tr.	2.0	2.6	1.1	5.2
"	10	Tr.	1.0	11.1	1.3	1.0
"	10	Tr.	1.0	1.6	5.9	0.9

The Rose showings follow a narrow vein of copper striking in a northerly direction. Three samples from this vein assayed as follows:

NO.	WIDTH	Au. Oz/Ton.	Ag. Oz/Ton.	Pb. %	Zn. %	Cu. %
M 12	2'	Tr.	3.10	-	Tr.	10.8
M 17	4	Tr.	0.45	-	1.8	0.65
O'Grady	2	Tr	4.0	-	-	12.5

This vein is exposed at close intervals over a length of 80 feet. It strikes towards the Lilly showings and may be connected with them.

Whistler Showings, Area (2)

These showings are situated near the centre of the Whistler claim which is the most southerly of the group. The showings are at elevation 4490 feet above sea level and are the highest on the property. They are among the earliest showings discovered on the property and have been opened up by six open cuts as shown on the accompaning plan, Whistler Showings (2). Also indicated on this map are three diamond drill holes put in by Britannia Mining and Smelting company.

The farthest south trench is about 100 feet in length and runs in a direction N70 East. There are three bands of sulphide ore in this trench. The most westerly one contains besides copper and zinc, a band of solid galena. Two samples from this showing, one M8 taken by Angus McLeod for the Surf Inlet Co. and the other by B.T. O'Grady assayed as follows:

NO.	WIDTH	Au. Oz/Ton.	Ag. Oz/Ton.	Pb. %	Zn. %	Cu. %
M 8	8'	0.01	1.0	4.2	8.2	2.0
O'Grady	4.75	Tr.	3.5	14.5	14.4	5.3

The next sulphide body to the east is 20 feet distant and gave the following samples:

M 9	7'	0.005	2.10	-	18.1	4.8
O'Grady	12	Tr.	2.8	2.7	7.4	4.9

The third ore body is exposed only on the south side of the trench but there is a pile of good ore on the dump which apparently came from the bottom of the trench. No samples were taken.

The next trench to the north is only 15 feet in length but exposes a solid vein of galena 10 to 12 inches wide, bordered by disseminated copper and zinc ore. Two samples by O'Grady assayed as follows:

WIDTH	Au. oz/Ton	Ag. Oz/Ton.	Pb. %	Zn. %	Cu. %
6'	Tr.	2.8	0.6	5.0	-
1'	0.005	8.8	69.5	1.6	6.3

The galena vein in this trench continues easterly through the westerly showing in trench 1 and through trenches 4,5 and 6.

Trench 3 is 20 feet due east of trench 2. It was

caved at the time of the present examination but the following sample was taken from this end of the trench by O'Grady.

WIDTH	Au. Oz/Ton.	Ag. Oz/Ton.	Pb. %	Zn. %	Cu. %
5'	0.04	1.5	5.6	6.0	1.0

Trench 4 is 20 feet north of trenches 2 and 3 and is 45 feet in length. There is a strong band of sulphide ore at each end of the trench. The following samples were obtained from the west end of the trench.

NO.	WIDTH	Au. Oz/Ton.	Ag. Oz/Ton.	Pb. %	Zn. %	Cu. %
M 1	11'	0.02	2.25	-	12.5	2.6%
O'Grady	3.5	Tr.	2.5	Tr.	14.9	3.2%

From the east end of trench 4 the following samples were taken:

M 7	6'	0.005	0.60	-	30.0	1.80
O'Grady	5'	0.01	1.5	-	39.9	1.7

Trench 5 is 10 feet north of the west end of trench 4. One sample from this by O'Grady assayed as follows:

NO.	WIDTH	Au. Oz/Ton.	Ag. Oz/Ton.	Pb. %	Zn. %	Cu. %
		Tr.	1.7	25.8	12.0	-

Trench number 6, twenty feet north of trench 5 gave the following samples:

O'Grady	Selected	Tr.	1.5	3.9	4.5	-
"	6'	Tr.	1.4	-	3.3	1.6
Dolmage	4'	0.03	1.4	1.1	7.3	-

Under these trenches three holes were drilled by Britannia Mining and Smelting Co. The positions and directions of the holes are shown both on the 100 scale and the 10 scale maps. The results

of this drilling are not available for publication or study.

These surface showings judged from their size, metallic content and geological environment appear to have considerable possibilities and it would seem improbable that three short drill holes, no matter what the results, could eliminate these possibilities.

Grouse Fraction Showings

At a point 70 feet south of the Harding claim and on the Grouse fraction a strong shear highly altered and mineralised is exposed in a trench 10 feet in length. Small amounts chalcopyrite, galena and zincblende are associated with larger amounts of pyrite. The shear has the usual northwest strike and steep dip. This shear is cut by a 2 foot lamprophyre dyke which strikes easterly and dips steeply north.

North west of this and 50 feet north of the southern boundary of the Harding claim is a copper vein about 2 feet wide, striking north 25 degrees west and dipping vertically. A sample from this assayed: Gold, trace; Silver 2.0 oz per ton; copper 7.4%. Further showings similar to the above and on the same strike were observed to the north of these showings.

Harding Showings, South Area (2)

The Harding showings are situated in the central part of the Harding claims near the old diamond drill camp and at elevation 4000. There are three large cuts as shown on the accompanying plan. These differ from most of the other showings in that the sulphide minerals and particularly the chalcopyrite

are confined mainly to a number of small sharply defined fractures as shown in the drawing. The showings are quite impressive and the sampling shows good values over large widths as follows:

NO.	WIDTH	Au.	Ag.	Pb.	Zn.	Cu.
M 16	10'	Tr.	0.50	-	0.70	1.15
M 15	12'	Tr.	0.60	-	-	3.15
M 14	-	Tr.	0.60	-	-	3.00

This area was tested by geophysical methods and then drilled by the Britannia company. The results of these tests are not available.

About 400 feet north of these showings a small vein carrying good copper values has been opened up and two samples taken as follows:

NO.	WIDTH	Au.	Ag.	Zn.	Cu.
M 5	2	0.16	0.80	4.4	3.15
M 6	2	0.005	1.85	2.3	3.50

This small comparatively high grade vein resembles in size, strike and content the small north-south vein on the Lily-Rose showings. It is thought that such veins are extensions from the larger lower grade adjacent shears.

Harding North, Area 4

On the northern boundary of the Harding claim where it is crossed by the deep canyon of the south fork of McVicar creek, a large showing of heavy sulphide ore was found during the season of 1935. On the east side of the canyon an old and partly caved cut extends up the face of the canyon wall for about 20 feet. The first 10 feet of this consists of nearly solid pyrite

with a little quartz and a few small grains and streaks of chalcopyrite. East of this there is 10 feet of ground less heavily mineralized, east of which is a foot of nearly solid pyrite. A sample across 9 feet of pyrite and quartz taken by O'Grady assayed: Gold, trace; silver, 0.60 ounces per ton and copper 1.6%.

North of this cut 20 feet another one exposes about 8 feet of disseminated pyrite in quartz and 1 foot of solid pyrite with a little chalcopyrite. South of the first mentioned cut 50 feet, a third cut exposes the same 10 feet or more of heavy sulphides and quartz. A two foot lamprophyric dyke lies just west of these three showings striking due north parallel to the shearing and sulphide banding.

In 1925 the Britannia company drilled a hole under this showing pointing it due east as shown on the plan of Area 4. This hole starts in the ore zone and in a distance of 22 or 23 feet it would have passed through it at a depth of only a few feet below the outcrop. It could not therefore give much new information concerning this showing.

About 300 feet east of this showing and 150 feet higher but not shown on the plan, are several other promising cuts in a wide shear striking north and south. Samples 38, 40 and 41 were taken from one big silicified shear between 50 and 100 feet wide. Sample 42 represents a narrow sulphide vein about 100 feet west of sample 41. This vein may be an extension or branch from the large shear. These samples assayed as follows:

NO.	WIDTH	Au. Oz/Ton.	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 33	3.0'	0.04	0.10	-	-	1.80
M 40	5.5	0.005	Tr.	0.1	-	0.25
M 41	8.0	Tr.	0.25	-	-	0.03
M 46	4.5	Tr.	0.48	0.15	-	1.05

The above samples, although lower than average grade, represent a very wide and strong shear which might, in other places, carry better values.

It is not known whether the above mentioned hole was drilled far enough to reach this big shear.

Rainstorm Showings, Area 5

There are two groups of showings on the Rainstorm claim, one of which is the most promising on the property and is usually referred to as the "copper showing". It is the more southerly of the two groups and is situated in the southwestern part of the claim. It consists of a wide shear zone in greenstone which has been largely replaced by quartz and sericite. The copper occurs as blebs and irregular masses of nearly pure chalcopyrite.

It has been traced by open cutting for 300 feet and at both ends it extends under overburden too deep to remove by hand methods. However in the most northerly exposures there was a noticeable narrowing in width and decrease in mineralization. Samples taken from the various cuts showed the following widths and values:

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 2	6.0'	0.005	1.50	-	1.0	7.90
M 3	4.5	0.005	1.85	-	Tr.	9.85
M 4	10.0	Tr.	1.50	-	0.30	9.10
M 48	6.0	Tr.	2.0	-	-	2.45
M 49	6.0	0.01	2.0	1.4	-	2.90
M 50	3.0	Tr.	1.4	0.1	-	3.10
M 51	7.0	0.01	0.75	0.05	-	3.30

The above samples were taken along the strike of one definite and continuous structure. However, 80 feet southwest of sample M4 another mineral fracture was found striking northeast, dipping vertically and carrying a considerable amount of chalcopyrite and a little galena. Its strike would cause it to join the main copper vein a short distance north of the cut at sample M 4. Two samples from this vein assayed as follows:

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 43	4'	Tr.	0.32	1.4	2.4	0.85
D 1	4	0.03	1.40	1.1	7.3	-

Two holes were drilled under these showings, the positions of which are shown on the accompanying plans.

On the Rainstorm claim 600 feet north of the above showings is a wide shear intensely silicified and impregnated with pyrite and chalcopyrite. In this locality four samples were taken as follows:

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 19	1.25	Tr.	0.10	-	-	0.10
M 20	4.0	0.005	0.13	-	-	0.10
M 21	3.0	Tr.	0.20	-	-	0.40
M 22	4.0	Tr.	0.50	-	-	0.35

At sample M 20 there is 6 feet of completely silicified country rock. At sample M 21 there is a similarly silicified shear at least 16 and probably more feet wide and at sample M 22 there is an equal width of shear but less silicification. Altogether this shear is 40 feet wide. Sample 19 is taken from a smaller structure not on strike with the large shear.

Violet Showings

Situated 500 feet southwest of the more southerly Rainstorm showings there are several exposures of copper ore on the face of a steep rocky cliff. These are in the southeasterly part of the Violet claim. Very little work has been done but there are several good showings. Two samples one from each of two small cuts assayed as follows:

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 55	2.5'	Tr.	1.60	Tr.	Tr.	6.30
M 56	3.0'	Tr.	0.40	Tr.	Tr.	1.20

These showings are in strongly sheared and silicified greenstone striking northwest and dipping westerly. Besides the two showings sampled there are other natural exposures of sheared greenstone carrying chalcopyrite.

These showings are nearly as far west and as near the contact of the quartz diorite of the Coast Range batholith as are the Cabin showings described below.

Cabin Fraction or McVicar Creek Showings, Area (7)

On the Cabin fraction about 1000 feet west of and 800 feet higher than the old McVicar cabin a new large showing was discovered and partly prospected this summer. It is the largest and strongest ore structure yet found on the property but as yet no mineralization of commercial grade has been discovered.

It consists of a very pronounced shear striking northwest parallel to the hillside and dipping westerly or into the hill about 45°. The slope of the hill is therefore nearly at right angles to the dip of the shear and so exposes its true width. Where discovered and opened up by trenching it is 200 feet wide. Little attempt has been made to trace it lengthwise but similar shearing is exposed at places in McVicar creek 600 feet to the south, and on strike with the above showings. In this latter showing there appeared to be better copper values.

Over its entire width it consists of quartz and sericite with an abundance of pyrite and smaller amounts of chalcopyrite and zincblende. The latter minerals, though sparce are widely and fairly uniformly disseminated. Altogether it is an impressive showing. Two samples from open cuts in the central part of the shear gave the following assay.

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 31	9'	Tr.	0.4	-	-	0.1
M 32	7	0.005	0.4	-	-	0.35

This showing is about 1500 feet east of the main contact of the quartz diorite of the Coast Range batholith and

dips towards it. It is the nearest showing on the property to this contact which fact may possibly account for its greater size and more intense mineralization. This area should receive much further investigation at depth and towards the contact.

During the season of 1947 a limited amount of prospecting was done in the area north of McVicar's old cabin. This section is somewhat lower and more easily accessible. It is a remarkable fact that in every section examined, interesting showings were found. Time and a shortage of labor did not permit of much development on these showings and although they have not been mapped in detail, they are worthy of brief mention.

Rock Creek

On Rock Creek which enters McVicar creek 1000 feet below the old McVicar cabin, some interesting showings were found. Twelve hundred feet up from this junction a strong well mineralized shear crosses Rock creek in a north-south direction. It has been opened up by six cuts for a distance of 200 feet. It is strongly silicified and pyritized and carries some chalcopyrite.

This showing is in greenstone just below a contact between this rock and a large bed or lens of coarse agglomerate. It was thought probable that this contact between two rocks of widely different strength might form a zone of weakness in which shearing would be concentrated and intensified. Further work along the contact was recommended but the necessary labor was not available to carry this out. A sample taken from this showing by the writer across 4 feet assayed: Gold, Tr. Silver Tr., Copper 0.7%.

Six hundred feet farther up and on the north fork of Rock creek two interesting showings carrying lead and zinc were found just at the end of the season. Samples from each of these assayed as follows:

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 46	Grab	0.04	1.4	0.2	4.5	0.45
M 47	3.0'	0.01	2.0	2.2	11.6	0.8

In this locality the overburden is exceedingly heavy and only small sections of these showings could be uncovered in the time and with the facilities available. Further work should be done. The precious metals alone in these samples have a combined value of between $1.75 and $2.00.

Mamquam Claim (B)

On the Mamquam claim and on a small tributary of McVicar creek, entering from the southeast a few feet below Rock Creek some good copper ore was found and opened up by two large cuts. The main cut exposes a mineralized shear 12 to 15 feet wide. Three samples taken across the shear from northeast to southwest assayed as follows:

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
D 4	5'	Tr.	Tr.	-	-	0.4%
D 2	6	0.005	Tr.	-	-	2.5%
D 3	5.5'	0.01	Tr.	-	-	0.9%

This shear strikes northwest and dips steeply to the southwest. It is the farthest east showing on the property, but may be in the same zone of shearing as that on Camp creek described below.

Camp Creek

On the Giant No. 1 claim and about 500 feet up Camp creek from the new camp a small tunnel was driven into the south side of the valley following a pronounced shear in the greenstone. Several streaks of sulphide extend the full length of the tunnel. Pyrite and chalcopyrite are abundant and galena and zinc blende present in small amounts. Three samples taken from this locality indicate the tenor of the ore.

NO.	WIDTH	Au. Oz/Ton	Ag. Oz/Ton	Pb. %	Zn. %	Cu. %
M 37	3'	Tr.	0.10	-	-	1.35
M 38	4'	0.01	0.32	-	-	1.30
M 39	Dump	0.02	0.48	-	-	1.60
D 6		Tr.	Tr.	-	-	0.60

After the above samples were taken a small amount of further drifting was done but lower grade material was encountered.

Giant No. 5 Claim

On the west side of the Giant No. 5 claim about 3000 feet north south of the new camp and 1200 feet up Slide creek from the trail crossing, an interesting showing was found late in the season. The ore here occurs in two intersecting faults and near the contacts of a lamprophyre dyke which has been displaced a few feet on both faults. The country rock is greenstone which, within a distance of 20 feet of the veins, is altered to sericite and impregnated with pyrite. Unlike the other showings on this property the greenstone is not noticeably sheared. The veins though narrow contain considerable chalcopyrite. Sample M 36

was taken from the best section of the vein across a width of 3', it assayed: Gold, trace, silver 0.10 ounces per ton and copper 1.2%.

SUMMARY & CONCLUSIONS

From the above descriptions and more particularly from the various drawings it is evident that this large property contains a large number of medium to low grade copper-zinc-silver deposits. The nature and grade of the ore are such that the deposits cannot be exploited successfully on any but a fairly large scale. Any less than 500 or 1000 tons per day would not be profitable enough to warrant the considerable capital expenditures involved. An operation of 1000 tons per day would consume 300,000 tons per year and the cost of developing and equipping the mine and the mill would be so great that not less than three or four years ore supply or say 1,000,000 tons would have to be assured before the undertaking would attract sound mining capital. The problem at the present stage of the investigation is to try and appraise the possibilities of finding a million or more tons of ore on the property.

Such an appraisal must be based on the facts revealed by the limited amount of surface stripping and diamond drilling which have been done, on certain geological considerations and on comparisons between these deposits and the similar deposits of the Britannia mines situated only a few miles to the southwest.

The work to date emphasizes the large number of important showings there are on the property. The number of

showings in relation to the amount of work done is remarkably large and no less remarkable is the fact that in every part of the property which was prospected during the past season new deposits were found. From this it may be concluded that mineralizing solutions were active over a large part of the property and on a large scale.

The showings besides being numerous are, considering the small amount of work done on them, large. The mineralization is intensely and widely distributed and the metal contents are such that if they could be extracted on a reasonably large scale would yield attractive profits.

The deposits are of a type which might be expected to persist to depths of several thousand feet. Deposits of this type have been mined to such depths in many parts of the world, and at Britannia, deposits of this type persist from 4300 feet above sea level to a considerable depth below sea level where mining is now in progress. There is a slight change with depth in the relative amounts of the metals present but little or no change in the value of the ore. Gold and zinc seem to increase in amount with depth.

The structures in which the deposits occur are large wide shears and these also might reasonably be expected at depths of several thousand feet.

The greenstone formation in which the deposits occur is part of a large inclusion in the granitic rocks of the Coast Range batholith and will at some unknown depth terminate in these

granitic rocks. Judging by the surface extent of the inclusion and by the fact that in the Britannia area the same inclusion persists at least 1000 feet and probably much more below sea level it is safe to expect that on the McVicar property it will extend down to similar depths.

Therefore, there is no geological reason why the deposits in question should not persist to several thousand feet of depth.

However, in their present limited stage of development the deposits appear to have at least two defects, irregularity and discontinuity. Irregularity, however, is not in itself a serious defect and there is a likelyhood of irregularity being misteken for discontinuity. Furthermore the irregularity may be more apparent than real, due to insufficient exposures and a lack of knowledge concerning the general pattern of the ore bodies. For example certain small high-grade copper veins found near several of the larger disseminated ore bodies may, on further investigation, prove to be parts or appendages of them and also to be more numerous than at present supposed; thus adding appreciably to the size and value of the deposits.

Discontinuity is, at the present stage of development, the most disturbing defect. All attempts so far made to extend the known dimensions of the various ore bodies have been unsuccessfull. Attempts made by the Britannia Company to trace the ore bodies downward by drilling were apparently partly unsuccessful, although some ore was found in most of the holes drilled. However

only two or three holes were drilled under each of three or four surface showings. The unsatisfactory results may have been due to causes other than discontinuity. It may have been that, owing to the irregularity of the ore bodies, the holes passed through lean areas in them, or through reentrant bays in their margins, or the ore bodies might have an exceptionally flat rake causing the drills to pass under them but without proving discontinuity.

Attempts made to extend the lengths of the ore bodies on the surface by stripping the overburden have as yet been unsuccessful. This again may be due to a lack of knowledge concerning the pattern of the ore bodies or due to their irregularity. In some instances, it is certainly due to too great depths of overburden.

If an ore deposit having a million or more tons is to be found on the property, this will be done by expanding one or more of the present ore bodies into such dimensions as will contain this amount of ore, or by establishing connections between two or more of the presently known ore bodies, or by finding ore of commercial grade in the Cabin Creek ore body, whose presently known dimensions are great enough to embrace the required tonnage, or by finding a new ore body of the required size and grade.

These possibilities are numerous and promising enough to warrant a very considerable amount of testing directed along the following lines and in the following localities.

The whole area lying south of Camp creek and between

Raffuse creek and the contact of the inclusion with the batholith should be geologically mapped on a scale of 100 feet to the inch.

Areas 1, 2, 3, 5 and 6 should be geologically mapped on scales of 20 or 30 feet to the inch. In doing this mapping the geologists should have at their disposal a crew of pick and shovel men to strip critical areas and to test out the various theories and possibilities which will arise out of this work as it progresses.

Contemporaneously with this programme, one or two deep holes should be drilled in the large silicified shear in area 7 in search of higher grade material at depth and nearer the batholith contact.

On the completion of the general mapping and the detailed mapping of two or three of the smaller areas, and as a second stage in the programme, further diamond drilling, as well as surface stripping may then be more effectively planned and if the season permits, carried to its conclusion.

As a further and final stage of the general plan, tunneling on one or more of the most promising ore bodies may be commenced. To enable this work to be carried out further trail work would be required so that a portable compressor and its required fuel could be hauled in to the tunnel sites selected. Very little further camp facilities would be required to carry out the entire programme and the tunneling could be carried on at any season of the year.

Stage one would cost in the neighborhood of $20,000.

Stage two would cost a further $20,000 or $30,000. The cost of Stage three would depend largely on the amount of tunneling planned and partly on the results obtained as the work progressed. Owing to the present high costs of labor, equipment and supplies, and to the necessity of doing a considerable amount of preliminary trail work at least $60,000 should be provided for this work. Altogether and allowing for unforseen contingencies, $150,000 dollars should be provided to carry the project to a final conclusion.

This whole amount, however, will not be risked unless encouraging results are obtained from the first stages of the programme, but it would be wise to provide the entire amount before launching the programme.

Respectfully submitted,

I. The program of exploration and development to be carried out by the McVicar Mining Company will include the following:

(1) The aerial mapping and photographing of the whole area.

(2) The geological mapping on a scale of 100 feet to the inch of the area south of Camp creek, west of Raffuse creek and east of the granite contact.

(3) The geological mapping on a scale of 50 feet to the inch of several of the most favourable areas.

(4) The deep drilling of the large silicified zone on Cabin fractional claim.

(5) At the conclusions of the geological studies, the most promising sections will be further tested by drilling.

(6) Finally, one or more of the most favourable showings will be explored during the winter months by tunnelling. Before this can be done it will be necessary to do considerable road and trail work to enable the hauling in of a compressor and other equipment.

Besides the above work, the advisability of using geophysical methods on parts of the area will receive careful consideration and if conditions are found to be favourable to these methods of exploration, they will be employed.

II. c. The area under option by the McVicar Mining Company is situated in an undeveloped area in which no roads exist at present. However, it is only 6 miles in a straight line and 9 miles by road and trail from the seaport of Squamish. The first 6 miles of that distance are covered by first class truck logging roads. The remaining 3 miles to the property are as yet spanned only by a pack horse trail. This will require considerable improvement to enable the hauling in of a small portable compressor. If ore is found in amounts to warrant a milling operation, a first class road will be built to the property. The cost of such a road, as well as the above mentioned trail improvements will be defrayed in part by the British Columbia Government.

f. The ore has not yet been subjected to metallurgical tests but it is so similar to the ore which the Britannia Mining & Smelting Co. have been successfully milling for the last 40 years, that no metallurgical difficulties are anticipated. The ore at Britannia is concentrated into a copper-gold concentrate, a zinc concentrate and a pyrite concentrate. The copper-gold concentrate is shipped to the Tacoma Smelter only 165 miles distance; the zinc concentrate to Selby, California and the pyrite is sold wherever a market can be found. The McVicar ore will return values in copper, zinc, silver and gold. A small amount of lead is present in one small section of the property. The McVicar ore should be as easy to treat as the Britannia ores which offer no unusual difficulties.

II. h. The property has not been sufficiently developed to enable the measurement of any proven ore.

IV. If the McVicar ore is milled, a copper concentrate containing the gold and most of the silver, will be made and shipped to the Tacoma Smelter and a zinc concentrate will be shipped to the Selby smelter in California.

(A) B. T. O'Grady was for many years employed as mining engineer by the British Columbia Department of Mines. He is the author of numerous excellent reports of the mineral deposits of British Columbia. He is a member of the Canadian Institute of Mining and Metallurgy.

(B) V. Dolmage was retained as a consultant by the Surf Inlet company during most of 1947. He has never at any time held any shares or other financial interest in either the Surf Inlet company or the McVicar property.

11. While the ore has not been tested and no mining has been done, some idea of the costs of mining and treating this ore can be had from the experiences of the Britannia Mining & Smelting Co. who operate on similar ore deposits situated only a few miles to the west. This company have consistently made profits on ore averaging about 1.4% copper, 0.008 ounces of gold and 0.12 ounces of silver per ton. In recent years a small amount of zinc has been recovered. From 3500 to 6000 tons per day are mined, depending on labor and other conditions.