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THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

GEOLOGICAL REPORT ON SOME OF THE CANAM COPPER CLAIMS
NEW WESTMINSTER M.D.

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S.E. Quadrant Long. 121° W, Lat. 49° N

CANAM COPPER CLAIMS

Invermay 2 M.C.	Vernon 2 M.C.
Invermay 4 M.C.	Vernon 3 M.C.
May M.C.	Vernon 4 M.C.
May 1 M.C.	Vernon 5 M.C.
May 2 M.C.	Vernon 6 M.C.
May 3 M.C.	Vernon 7 M.C.
May 4 M.C.	Vernon 8 M.C.
May 5 M.C.	Hank 1 M.C.
May 6 M.C.	Hank 2 M.C.
May 7 M.C.	Hank 3 M.C.
May 8 M.C.	Hank 4 M.C.
May 9 M.C.	Hank 5 M.C.
May 10 M.C.	Hank 6 M.C.
May 11 M.C.	Hank 7 M.C.
May 16 M.C.	Hank 8 M.C.
Misty M.C.	Brown 1 M.C.
Misty 1 M.C.	Brown 2 M.C.
Misty 2 M.C.	Brown 3 M.C.
Misty 3 M.C.	Brown 4 M.C.

by

J. RICHARDSON

PROFESSIONAL ENGINEER

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

GEOLOGICAL REPORT ON SOME OF THE CANAM COPPER CLAIMS

INTRODUCTION

General

A program of geological mapping was undertaken on 38 claims of the Canam Copper property. The purpose of this study of the north projection of the Dewdney Sediments was to search for other mineralized breccia zones similar to those found on the A.M. Group. This work required 45 days from the 22nd of September, 1958 to the 5th day of November, 1958. The work was done by J.K. Webb M.A. who was assisted by R. Gifford B.A.Sc., B. Spencer B.A. Sc. and E. Gobat. R. McEachern B.A. Sc., P. Eng. and J. Richardson B.A., P. Eng. acted as consultants and each man spent more than a week on the property.

Location and Access

The Canam Copper Co. consists of 51 claims, only eight of which are Crown granted. Three additional claims have been applied for in the park area. This large group contains the two original holdings, the A.M. (at the south end) and the Invermay Annex (in the valley of Silver Daisy Creek).

The property is situated in the New Westminster Mining Division about 30 miles southeast of Hope. Access is by way of a mine road which leads southerly off the Hope-Princeton Highway near Mileage 28. It is about six miles by the mine road to the upper workings (5500 elevation) on the A.M. Group. The upper two miles of this road is passable only by four-wheel drive vehicles. The road continues northwesterly over the pass and down Silver Daisy Creek to the old Invermay camp about two miles beyond the upper A.M. camp.

History

Cominco acquired the A.M. Group by staking in 1930. From 1930 to 1938 about 2,500 feet of underground development was completed in six levels. In 1946 the A.M. Group was optioned by Canam Amalgamated Mines (Canam Copper Co., 1951). This company continued with underground development and began diamond drilling from the surface and underground. In 1954 American Metals did a minor amount of drifting on 10 level together with some underground drilling. In 1955, Mogul Mines began the 15 level tunnel which was driven 5,454' by February 1957 when all work ceased.

The Invermay property was first staked in 1953 as the Norwegian Group. Subsequently more claims were acquired and the group became known as the Invermay Annex Mining Co. This company built a two-mile areal tram line plus a campsite in 1935 and by 1938 had driven four levels plus two prospect adits.

From 1938-43 the property was under the management of the Skagit River Development Co.

These early companies actually shipped a few tons of ore to the Trail Smelter as follows:

Date	Tons	Gold Oz/T	Silver Oz/T	Lead %	Zinc %
1936	21.28	0.01	175.3	13.6	19.8
1941	42.25		74.5	9.4	9.6
1941	33.91		94.1	11.3	9.7
Totals	97.44	-	103.3	11.0	11.9

Canam Amalgamated Mines obtained the property in 1943 and by the end of 1947 seven adits had been driven with combined lengths exceeding 2,000 feet. No. 1 adit at 5971 elevation is the top adit and at the base of the slope in No. 6 adit at 5030 elevation. About 6,700 feet of drilling was completed by the end of 1947. Since the end of 1947 very minor work has been done.

In August 1958 Cominco made an agreement with Canam for the property and geological mapping began September 22nd. Pace and compass mapping off chained base lines was completed on a scale of 300' = 1" on 38 of the claims held by assessment work. Geological work continued to November 5th when excessive snow stopped all work.

Topography and Drainage

The Canam property lies near the northern edge of the Cascade mountains. From a ridge top at the Canam the broad wooded rolling ridges of the interior plateau can be seen off to the north and northeast. This view is in contrast to the serrated rugged peaks that mark the horizon in all other quadrants. The Canam property is in the Hozameen Range near its western boundary which is outlined by the Skagit River. The highest peaks of the Hozameen exceed 8,000 feet with the average ridges at about 6,000 feet. The base level at the Skagit River is at 2,100 feet. Slopes are generally gradedwith only occasional steep rocky horns and shear walled canyons transposed on an otherwise mature topography.

Glaciation has affected the topography locally where steep-walled cirques form north slopes while the south slopes are usually grass covered and gentle.

All creeks flow to the Skagit River which nearly surrounds the Canam property by virtue of two right-angled changes of direction. The headwaters flow northwest to the Snass where it swings sharply southwesterly and west of Shuwatum Mt. where it swings southeasterly to cross the border. The final southeasterly leg is believed to lie along what Daly describes as a master fault valley - in fact the Skagit appears to be following regional fault directions on all courses.

GENERAL GEOLOGY

Rock Types

Underlying the Canam claims are a thick band of sediments known as the Dewdney Creek Group of Upper Jurassic or Lower Cretaceous Age. This group has a northwest trend and is about eight miles wide with the west boundary of the group nearly coinciding with the west edge of the Canam claims.

The Dewdney Group consists of well banded dense dark gray to light gray siltstones and tuffs. This group displays a remarkable sameness at Canam where no markers have been recognized.

Typically they are hard and brittle with a cherty appearance. Frequently they contain fine pyrite or pyrrhotite which results in a rusty weathered surface. The weathered surface is often whitened due to the development of kaolinite. On the average these thin-bedded sediments strike northwesterly with steep westerly dips.

A great variety of dykes and sills intrude the Dewdney Creek Group. The most common dyke or sill is a very fine grained rock with recognizable feldspar laths. Frequently they contain fine pyrite or pyrrhotite in a dark gray to purplish gray groundmass. On the surface these dykes appear massive and blocky and are often more rusty than the adjacent sediments. This rock more often occurs in narrow sills but irregular-shaped masses 20-30' wide may be seen crosscutting the sediments. Many of the sills have not been indicated in the mapping partly because they are often difficult to recognize and partly because the time necessary to outline their irregular shape was not available. These rocks were tentatively classed as of intermediate composition.

A somewhat similar dark fine grained rock, more rarely seen, with a definite siliceous appearance was classed an acid dyke.

A dark green medium to coarse grained dyke composed largely of hornblende with a fine feldspar groundmass has been mapped as an ultra-basic. Daly has described this rock as being similar to the peculiar gabbro sills of the Moyie and other sills of the Purcell Range. He called it a hornblende porphyrite. This rock was noted in the drill core and in the underground mapping but in only one area on surface. This rock apparently weathers quite rapidly.

Another type of dyke seen near the Invermay Pass and in some of the core seems closely related to the quartz-diorite intrusive of the Invermay area. The surface dykes are medium to coarse grained and frequently porphyritic. Feldspar phenocrysts, or less frequently quartz phenocrysts, occur in a medium grained groundmass made up chiefly of feldspar and quartz. In the drill core there is a fine grained buff-gray rock with visible quartz and feldspar and little or no mafic constituents. This rock occurs east of the mine breccia and may be similar to some of the granitic rocks intersected in the lower level tunnels (below No. 6 tunnel A.M. Group).

An irregular-shaped quartz-diorite body extends in a northerly direction across Silver Daisy Creek valley. In the low part of the valley it is nearly a mile wide but it narrows rapidly to about 1,000 feet a short distance north and south of here. On the average this is a medium grained equigranular light gray rock made up largely of pale gray feldspar and quartz with minor amounts of hornblende or biotite and less commonly tourmaline. The mafics comprise no more than 10% and often much less, while quartz may range up to 25% of the total composition of the rock.

Alteration

The siltstones show colour variation from white to dark gray. Often a single specimen will show the dark and light variation with a spotted blotchy boundary strongly suggesting the light colour is a secondary feature. This is possibly due to the initial development of white mica through the breakdown of feldspar.

A brownish weathering sugary textured rock has been mapped along parts of the quartz-diorite contact. This rock consists of fine quartz grains and appears to be an alteration of the siltstone as this granular quartz rock changes gradually to the typical siltstone. The very wide zone of alteration near the north end of the mapping would imply that the quartz-diorite has a shallow dip to the north in this area. South of the Invermay Pass the siltstone is so altered that it is indistinguishable from the finer phases of

the quartz-diorite. In these instances the siltstone appears to have been granitized.

Near the mouth of Silver Daisy Creek a peculiar greenish gray cherty rock was mapped as a chloritized siltstone. The texture of this rock and its general appearance is that of the typical siltstone except for the chloritic green alteration. This chloritic siltstone occurs as a nearly continuous band striking parallel to the Hozameen Fault.

Brecciation

Three large breccia zones have been outlined in our mapping. A brecciated area along the Hozameen fault will be described separately.

Of the three breccia zones, the Invermay Breccia occurs in the quartz-diorite, the other two are siltstone breccias.

The Pass Breccia and the Tramline Breccia resemble the Mine Breccia as seen on the surface. They are all rusty-brown with hackly broken surfaces which contrast with the relatively smooth surface of the unbrecciated rocks. Fragments are often difficult to distinguish in the uniformly rusty surface and often the best evidence of fragments is the depressions left by recently eroded pieces.

The Invermay Breccia is a brecciated quartz-diorite. Fragments of fresh gray rock are angular, much coarser on the average, than the other breccias. Another difference is that fragments make up most of the rock with the matrix apparently of the same composition as the fragments with the addition of tourmaline and quartz, and possibly some calcite. The Invermay Breccia is not as uniformly rusty as the other breccias although this is not true of the east end. In the eastern area a well-defined set of shears mark the eastern corner. The breccia here is a deep rusty brown and a part of this rock has a peculiar banding which other writers have described as a gneissic phase. This banded rock consists of alternate black and white bands a fraction of an inch wide. The black bands are made up of fine black tourmaline and the white bands are of feldspar and quartz. In the surface mapping large blocks (islands) of unbrecciated quartz-diorite up to 20 feet wide were noted within the breccia outline.

Near the mouth of Silver Daisy Creek a zone of brecciation has been shown which differs from any of the previously mentioned brecciation. Here a zone, parallel to the Hozameen fault shows vague brecciation in siltstone. The siltstone on the average is merely fractured with minor displacement of fragments and a matrix as such is not present. The fragments are small, angular and the surface is smooth. This rock looks more homogeneous than the other breccia zones with their distinctive matrixes.

Mineralization

At the Invermay Breccia two types of mineralisation have been indicated. All the underground development was exploring a strong, relatively tight shear zone that strikes northeast with a nearly vertical dip. Along this shear a narrow zone of mineralisation contained galena, sphalerite and minor chalcopyrite. Silver values assayed over 100 oz/ton. This mineralization along the shear was never more than two feet and often only a few inches wide. Diamond drilling from the drifts revealed a different type of mineralisation in the quartz-diorite breccia zone. This consisted of fine disseminated chalcopyrite that gave wide uniformly low grade values in copper. Drilling was confined to the eastern (down-hill) part of the zone.

Structure

Regionally three major faults have been recognized in the Dewdney Group. The Hozameen fault, near the mouth of Silver Daisy Creek, separates the Dewdney Group from the older Hozameen rocks to the west. The east contact of the Dewdney is also a fault contact known as the Chawanten fault. All three of these faults strike northerly to northwesterly and they are described as west-dipping thrust faults.

At the Invermay a northeasterly shear is the key structure in the lead-zinc mineralization mentioned previously.

The east contacts of the Invermay Breccia are clearly outlined by a north-striking and a northeasterly-striking fault.

In the Dewdney Group in the Canam area, no markers have been recognized so that the structural picture is unsolved. Areal mapping could help solve this.

CONCLUSIONS

The Canam property is underlain by a thick series of banded sediments of the Dewdney Creek Group of Upper Jurassic or Lower Cretaceous Age. These sediments have been intruded by a quartz-diorite stock as well as by numerous dykes and sills ranging from acid to ultra-basic in composition.

The structure has not been solved because of the absence of suitable markers but local evidence of folding is apparent. Regional faults with northwesterly to northeasterly strikes have been mapped by the G.S.C. Faulting is extensive in the vicinity of the breccia zones. However, the origin of the breccias was not solved by the surface mapping.

All economic mineralization has been found in the breccia zones on the A.M. Group. The Invermay Breccia contains some disseminated chalcopyrite of sub-ore grade as well as the shear zone lead-zinc. The other two breccia zones showed very weak surface mineralization.

References

(1) B.C. Minister of Mines Annual Reports 1938, 1948 and 1954.

(2) G.S.C. Memoirs Nos. 38 and 243.

(3) Canam File Reports.

Attachments

(1) Accounting Statement

(2) Invermay Area South Sheet 1" = 300'

(3) Invermay Area North Sheet 1" = 300'

J. Richardson
Professional Engineer

JRN:gae
Exploration Office, Western District
January 22, 1959

Distribution: Legal Division (2)
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Western District Exploration (1)

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1958 GEOLOGICAL MAPPING EXPENDITURES - CANAM COPPER MINERAL CLAIMS - NEW WESTMINSTER M.D.

WAGES

1 Geologist for 1-1/2 months	@$800/month	$ 1,200
1 Geologist for 1-1/2 months	@$550/month	825
1 Geologist for 1-1/2 months	@$550/month	825
1 Geologist Helper for 1-1/2 months	@$350/month	525
		$ 3,375

SUPERVISION

1 Senior Geologist for 1/4 month	@$900/month	$ 225
1 Senior Geologist for 1/4 month	@$1,100/month	275
		$ 500

TRANSPORTATION

1 Jeep 600 miles @17¢/mile	$ 102

BOARD

195 man days board	$ 585
TOTAL	$ 4,462

J. Richardson
Professional Engineer

Endorsed by:

G. Hanson
Branch Accountant

JRW:gms
Exploration Office, Western District
January 23, 1959
Copies (5)