

823270

82 E

JAMES A. RICHARDSON GEORGE T. RICHARDSON

*attach to Paul 1966
update*

RICHARDSON SECURITIES OF CANADA

FEB 22 1967

RICHMOND-ADELAIDE CENTRE
120 ADELAIDE STREET, TORONTO 1, ONTARIO
TELEPHONE 362-3941 • AREA CODE 416
RESEARCH DEPARTMENT

February 21, 1967.

W.S.R.	
J.C.G.	
J.H.S.	✓
E.J.	
R.D.	
D.C.	
P.M.	✓
G.W.	
R.O.	
C.F.	
J.H.	
G.J.	
K.F.	
J.J.	
Ecj	

Dr. Paul Kavanagh,
Kerr Addison Mines,
Suite 1600,
44 King Street West,
Toronto, Ontario.

Dear Dr. Kavanagh,

I am enclosing for your information, our latest projection on Brenda Mines.

With best regards,

Yours sincerely,

H. Reimer.

HR:mns

Encl.

February 9th, 1967.

BRENDA MINES LIMITED

Recent Developments

On January 3rd 1967, the company issued a report which provided more detail on tonnage and grade on the Brenda ore reserves. In a previous report dated November 29th, 1966, we had calculated a P.V. of \$11.40 per share with an average annual net cash flow of \$1.72 per share. These estimates were based on 20 years output of reserves grading 0.230% copper and 0.106% Mo S₂. However the recent report shows the 20 years of reserves broken down into three main categories.

1. - initial 3 year period of relative higher grade material.
2. - a further 10 year period of average grade material.
3. - a final 7 years of lower grade material.

The recent ore reserve figures show 136,845,000 tons, of which 118,450,000 are drill indicated and 18,395,000 tons are inferred. Of the pit ore, 86,757,000 tons grade 0.22% Copper and 0.108% Mo S₂ and 50,088,000 tons grade 0.146% copper and 0.055% Mo S₂. During the initial 3 year period the Company plans to mill about 21,000,000 tons grading 0.245% copper and 0.128% Mo S₂.

Below is a calculation of operating profit and cash flow for each of the three stages, along with corresponding totals for the life of the property.

It should be noted that recoveries of 85% for both copper and molybdenite are used in the projection. In actual fact recoveries of 95% copper and 93% molybdenite have been achieved in the metallurgical test work and acceptable concentrates are being produced.

.....Cont'd.

STAGE I - Higher grade material - 0.245% copper
 (estimated 3 year duration) - 0.128% Mo S₂

Net Smelter Return per ton $0.245 \times 85\% \times 20 \times (34\text{¢} - 7\text{¢}) = \1.12
 $0.128 \times 85\% \times 20 \times (\$1.74 - \$0.05) \times .6 = \underline{2.21}$

Total 3.33

Less estimated operating costs per ton 1.50

Estimated operating profit per ton 1.83

Total Annual Operating Profit = $20,000 \times 360 \times 1.83$
 = \$13,150,000

STAGE II - Average Grade Material - 0.210% copper
 (estimated 10 year duration) - 0.100% Mo S₂

Net Smelter Return per ton $0.210 \times 85\% \times 20 \times (34\text{¢} - 7\text{¢}) = \0.96
 $0.100 \times 85\% \times 20 \times (\$1.74 - \$0.05) \times .6 = \underline{1.72}$

Total \$2.68

Less estimated operating cost per ton 1.50

Estimated operating profit per ton 1.18

Total Annual Operating Profit = $20,000 \times 360 \times 1.18$
 = \$8,460,000

STAGE III - Low Grade Material (already mined
 and stockpiled). - 0.146% copper
 (estimated 7 year duration) - 0.055% Mo S₂

Net Smelter Return per ton $0.146 \times 85\% \times 20 \times (34\text{¢} - 7\text{¢}) = \0.67
 $0.055 \times 85\% \times 20 \times (\$1.74 - \$0.05) \times .6 = \underline{.95}$

Total \$1.62

Less estimated operating cost per ton 1.00
 (this figure includes Milling and overhead only)

Estimated operating profit per ton 0.62

Total Annual Operating Profit = $20,000 \times 360 \times 0.62$
 = \$4,450,000

Conclusion: From the attached sheet the Present Value of net cash flow is calculated to be \$11.25 per share with an average annual net cash flow of \$1.37 per share. In the November 29/67 projection, assuming 0.23% copper and 0.106% Mo S₂ over a full 20 year period the corresponding Present Value was \$11.40 per share and cash flow was 1.72 per share. Thus Cash Flow did diminish using the revised estimates but because of an accelerated cash flow in the first three years the Present Value remained comparable.

It is interesting to note that with the latest ore reserve estimates, the Present Value of net cash flow in the first 13 years is equal to \$10.20 per share while it increases to only \$11.25 per share for 20 years. The low grade segment in the final 7 years therefore contributes little to the overall present value.

It is still possible to see an objective for the stock in the \$12 - \$15 range by early 1968 if the property is put into production. In view of the strong Japanese interest in the situation there still appears to be a good chance that Noranda will go ahead with production.

Respectfully submitted,

Brian E. Backler

Brian E. Backler,
Toronto Research Division.

JAN 31 1967

KERR-ADDISON GOLD MINES LIMITED

82 E

(FOR INTER-OFFICE USE ONLY)

attach to previous

- W.S.R.
- K.G.G.
- J.H.S. ✓
- E.F. ✓
- R.D.S.
- B.C.B. ✓
- P.M.K. ✓
- G.W.M.
- R.O.M.
- G.K.W.
- J.B.S.
- G.P.R.
- K.F.L.
- J.H.
- E.C.J.

To..... Mr. P. M. Kavanagh..... From..... W. M. Sirola.....

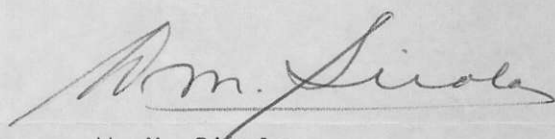
Subject..... Brenda Mines, Peachland, B.C. Date..... January 30, 1967.....

seems high
M.K.

George Cross Jr. telephoned on Friday to say that he had been advised by Merv Davis of Brenda Mines that in a report written by Wright Engineering and Chapman, Wood and Griswold, the final recoveries in the pilot plant were Copper - 93%, Molybdenum - 91%. Impurities in the Molybdenum concentrate, 0.19%. In order to achieve this degree of purity in the Molybdenum concentrate it was necessary to use cyanide and acid leaching.

George intimated with tongue in cheek that the financing for Brenda would be in the form of debentures guaranteed by Noranda. In return for the guarantee, Noranda would expect a share bonus.

All of this may not be news to you but I very much appreciated George's conveying the information to me and I pass it along for what it is worth.



W. M. Sirola.

WMS/1k

NOV 11 1966

KERR ADDISON MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

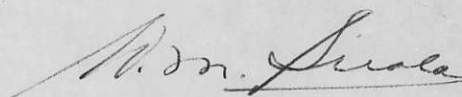
82 E
attach to
Jan 1966
update

To Mr. P. M. Kavanagh From W. M. Sirola

Subject Brenda Mines, B.C. Date November 9, 1966

W.S.R.
K.C.G.
J.H.S.
E.F.
R.D.S.
B.C.B.
P.M.K. ✓
G.W.M.
R.O.M.
C.K.W.
J.B.S.
G.P.R.
K.F.L.
J.P.
(E.C.)

The only additional information I have on Brenda is that in attempts to separate the molybdenum from the chalcopryrite, a molybdenum concentrate was produced containing 1% copper. The aim is to produce a molybdenum concentrate containing 0.2% Cu.



W. M. Sirola.

WMS/lk

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

82 E

FEB 11 1966

attach to
Previous
correspondence.

To..... P.M. KAVANAGH..... From..... W.M. SIROLA.....

Subject..... BRENDA MINES LIMITED..... Date..... February 10th, 1966.....

- W.S.R.
- K.C.B.
- J.H.S. ✓
- E.F.
- R.D.S.
- B.C.B.
- P.M.K. ✓
- G.W.M.
- R.O.M.
- C.K.W.
- J.B.S.
- G.P.R.
- K.F.L.
- E.C.J.

I discussed this situation with Tom Walker this morning.

He maintains that the current increase in price of Brenda shares results from the fact that Brenda Mines are now drilling a large I.P. anomaly which trends northwestward, in contrast to the fracturing which is northeasterly. Two of the NX drill holes encountered grades which were 1.5 times the average of previous drilling, and, since the holes are 400-ft. stepouts, each hole provides 4-6^{million} additional tons.

The most interesting revelation by Tom was that the current wireline holes drilled in the vicinity of the previous drilling did not upgrade the mineralization.

Apparently when Kennco had this property they had McPhar do I.P. work on lines 2,000 ft. apart. This work did indicate a northwesterly trending I.P. anomaly, but apparently because this was in disagreement with the fracture trends which seemed to be the mineralization control, no effort was made to drill this anomaly.

Wm Sirola
William M. Sirola.

WMS:iw

82E
JAN 21 1966

attach to Previous correspondence of March 65

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

To P.M. KAVANAGH.

From W.M. SIROLA.

Subject BRENDA MINES.

Date January 19th, 1966.

W.S.R.	
K.G.	
H.S.	✓
L.F.	✓
R.S.	
B.	
P.K.	✓
G.M.	
R.M.	
C.W.	
J.S.	
G.R.	
K.L.	
L.B.	
E.C.	○

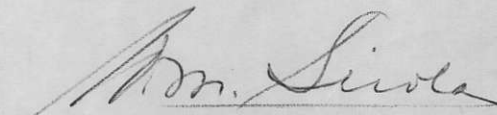
In reply to your inquiry over the telephone yesterday I have garnered the following information, largely from George Cross, Jr.:

Last summer, some fifteen H-size drill holes were put down adjacent to EX and AX holes drilled in previous programmes. H core is 3" in diameter, and apparently there was much less loss of MoS₂ in the large diameter holes than there had been in the smaller holes. This presumably accounts for the higher grade obtained in the drilling. Cross mentioned that metallurgical testing had been done by John Britton, Mitsui, and Noranda. From these tests it would appear that an 85% recovery of both copper and MoS₂ is realistic. If this is indeed the case, then the .07% Mo would have a value of \$1.46, and the .25% Cu would have a value of \$1.48. The total value then would be \$2.94 per ton.

*- before last summer
Mo content was
considered to be <.07%*

If operating costs, including overhead, could be kept at the \$1.50 level (and I base this on a 1 - 1 stripping ratio), then the deposit would appear to have definite economic possibilities if 70 million tons, or more, of this material can be found.

I attempted to contact Morris Menzies by telephone, but he did not return my call. Unless I can verify upgrading by last summer's drilling, I am unable to make any definite recommendations. If the upgrading did take place, then the deposit patently becomes something of economic interest. If the upgrading did not take place, the deposit is of no economic value.



William M. Sirola.

Brenda

April 12/65.

- following notes were taken by PMK during a talk to Brynelsen in Bell's office on Apr. 12/65.
- 1 day individuals in a syn - trustee Alex Fisher
- form a 3 million sh. Co
under syn gets 450,000 shares
+ \$50,000 over 3 or 4 yrs.
- \$120,000 to be put into Co in 6 units.
- \$60,000 required as a minimum programme to get
good bulk sampling done.
- Nippon & Mits. bushi both interested.
- \$120,000 would earn the remaining 300,000 sh under
stock.

April 19th

- ~~while~~ while talking this ~~over~~ over with Mr. Row last week I recommended we do not participate because

- 1) Noranda would not let us in on its holdings tied on to the north.
- 2) we have no other projects in the area,
- 3) our Spanan Ck zone looks to have better mineralization
- 4) the new Co. fm arrangement suggested by Brynelsen looks messy & promotional.

Mr. Row approved my negative recommendation. PMK Apr. 19/65

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

To..... P.M. KAVANAGH. From..... W.M. SIROLA.

Subject..... BRENDA COPPER - MOLYBDENUM PROSPECT, Date..... April 5th, 1965.
OSOYOOS MINING DIVISION, B.C.

W.S.R.
K.C.G.
J.H.S.
E.E.
R.D.S.
E.C.B.
P.N.A. ✓
E.W.M.
R.O.M.
C.K.W.
J.B.S.
G.P.R.
K.F.L.
(E.C.B.)
(E.C.J.)

I had lunch with messrs. Brynelson and Menzies, and we had a long talk about this prospect. They equipped me with most of the maps that they have, and the logs of the drill holes, including the 1962 drill hole numbered Mutch No. 1.

Mutch No. 1 was drilled by a Vancouver drilling contractor by the name of Mutch, who, apparently, drilled this hole for his own account in 1962. He may have had associates, and it is rumoured that Neil MacDiarmid was one of them. However, we have no confirmation on that score. According to Menzies, Mutch was, at that time, a member of the vendor syndicate, and he drilled the hole to increase his position in the syndicate.

The proposed depth of the hole was 1,500 ft., but it was stopped at 585 ft. Average grade is given as 0.193% copper. Some composites were assayed for Mo. These were from 220 - 419 ft., and from 419 - 585 ft. The average of these two sections was .035% Mo.

Both Brynelson and Menzies feel that it should be possible, by crushing the rock from this property to about 1" size and putting it over a series of screens, to up-grade the material significantly. I believe Morris mentioned recovering 50% of the mineralization in something like 20% of the volume. In other words, they feel that if the volume of material to be put through a mill could be greatly reduced by crushing and screening, a relatively high-grade mill feed would result. They feel that a pilot plant should be established on the property for this purpose.

Without seeing samples of the jointing and mineralization, I do not know whether this premise of up-grading is a valid one. I am rather skeptical of its merit, but would suggest that if sufficient interest is generated within the Kerr organization for this prospect, then the simple solution might be to obtain several hundred pounds of the rock and have some organization, like Britton Laboratories, do a crushing and screening test. If the procedure works, then it would be feasible to do some very careful drilling (rotary or percussion) to see if the mineralization is higher grade at depth as suggested by E.P. Chapman.

I would recommend our involvement in this situation to the extent just mentioned, i.e., that we pay for some proportion of

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

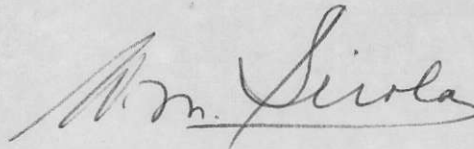
To.....From.....

Subject.....Date.....

contd/..

- 2 -

preliminary testing. Perhaps a condition of our involvement in this prospect would be that we also be given the right to participate in the area to the north, if it becomes evident in due course that such an involvement is desirable.



William M. Sirola.

WMS/iw.

KERR ADDISON MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

W.S.R.
K.C.G.
E.F.
R.D.S.
B.C.B.
P.M.K. ✓
S.W.M.
H.A.P.
C.K.W.
J.B.S.
G.P.R.
K.F.L.
J.B.
E.C.J.

To..... W. M. Sirola..... From..... P. M. Kavanagh.....
Subject..... Brenda Copper - Molybdenum Prospect,..... Date..... March 29th, 1965.....
Osoyoos Mining Division, B.C.

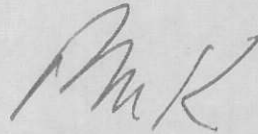
The attached data were given to me last week by Mr. J. H. Stovel who at the same time offered Kerr an opportunity to participate in more exploration work on the property.

I am not overly impressed with the situation but wish that you would give me your comments.

You will note that on page three of his report Chapman lists as Item No. 4 a log of a 1962 drill hole called Mutch No. 1. I think it is the only place in his report that he refers to any work after 1957, and he doesn't comment further on that drill hole. I am curious as to who drilled that hole, and what it was like, and also as to how much work may have been carried out on the property since 1957, and by whom, and with what results. Perhaps you will be able to find answers to these questions from Menzies, Gower, or Chapman.

Mr. Stovel thinks that Noranda has a similar property in its own account in the same region, having possibly a better indicated grade.

I think the amount of participation we are being offered is quite open.



Paul M. Kavanagh
Chief Geologist - Exploration.

PMK:sw

Enc.

Brenda

3,000,000 share

Vendors 450,000 shares + 50,000 over several years
2,000 down - 6 months - \$5000 ±

300,000 shares @ 40 = 120,000
20 6 pieces @ \$20,000 = 120,000
1/2 firm

[Nippon - Mitsubishi] - Places - 2 u
- say split unit

Friends of B.O.B. - 1 unit Ken - 1 unit

Public - 1 unit

Several others want a piece too.

.35 Cu .07

7 lbs @ 2.24 1.80 - 3.50

.6

PLEASE REPLY DIRECT PLEASE HANDLE
 FROM R.V.P. says A.K.
 DATE
 PLEASE SEE ME YOUR COMMENTS
 FOR YOUR INFORMATION FOR APPROVAL
 PLEASE RETURN PLEASE RETURN
 this Brenda proposition

He is not prepared to
 have Noranda take any
 until Archie is back.

C.R.

THE BRENDA COPPER-MOLYBDENUM
PROSPECT

OSOYOOS MINING DIVISION, B.C.

CHAPMAN, WOOD & GRISWOLD LTD.

November 20, 1964

E. P. Chapman Jr.
E. P. Chapman Jr.



TABLE OF CONTENTS

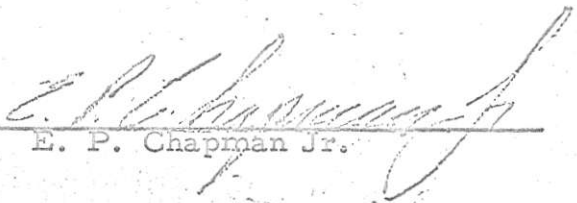
	Page
SUMMARY CONCLUSIONS AND RECOMMENDATIONS	A
INTRODUCTION	1
LOCATION	1
ACCESS	2
HISTORY - PREVIOUS REPORTS AND DATA	2
TITLE	4
GEOLOGY	4
EVALUATION OF EARLIER WORK	5
MINIMUM TARGET	7
CONCLUSIONS	8
RECOMMENDATIONS	10

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

1. The Brenda Prospect, in the Osoyoos Mining Division, B.C., has been shown to contain a mineralized body having a tonnage potential ranging from several hundred million to over a billion tons.
2. Copper and molybdenum in the form of chalcopyrite and molybdenite occur principally as fracture filling in granodiorite host which has been intensely fractured.
3. Preliminary grade estimates based on a limited amount of diamond drilling suggest an average metal content too low to sustain a profitable operation on any scale.
4. We believe that results to date are inconclusive and that there is sufficient chance that substantial portions of the deposit may be sufficiently high in copper and molybdenite content to meet minimum target requirements for large scale operation to justify a programme of further evaluation.
5. We recommend a programme of extended geochemical coverage, percussion drilling, shaft sinking and bulk sampling designed to check past drill results against different drilling techniques and against the actual grade of mineralized material in place. We estimate that the cost of carrying out this programme will be approximately \$30,000.
6. Following completion of the programme, results should be carefully studied and a new evaluation of the Brenda Prospect should be made.

Respectfully submitted,

CHAPMAN, WOOD & GRISWOLD LTD.


E. P. Chapman Jr.

November 20, 1964

THE BRENDA COPPER-MOLYBDENUM PROSPECT

Osoyoos Mining Division, B. C.

INTRODUCTION

At the request of Mr. B. Brynelsen, Mining Engineer, the Brenda Copper-Molybdenum Prospect was visited on October 18, 1964. Several hours were spent at the property during which time outcrops near the camp were examined and a small quantity of diamond drill core was studied.

While in the short time available, the on-site examination was necessarily superficial, sufficient time was spent to permit confirmation of environmental and structural information appearing in reports on the property made available to C. W. & G. Ltd. by Mr. Brynelsen.

Comprehensive field programmes had been carried on the Brenda Prospect in 1956 by Noranda Exploration Co. Ltd. and in 1957 by Northwestern Explorations Ltd. Work done included geologic mapping, geochemical surveys, self potential and induced polarization surveys, fracture pattern analysis, and a limited amount of diamond drilling.

The purpose of our examination and study was to determine whether, considering the results of previous work and current and projected metal prices, additional work on the property would be justified.

LOCATION

The centre of the Brenda holdings is situated at approximately N. Latitude $49^{\circ}52'30''$ and West Longitude $120^{\circ}00'30''$ near the boundary between the Similkameen and Osoyoos Mining Divisions. Peachland, B. C. lies 14 miles to the southeast. Elevations in the claim area range from 4700 feet to 6100 feet above mean sea level.

ACCESS

The property is reached by about 20 miles of good to fair dirt and gravel road from Peachland. With some grading and maintenance the present road is adequate for the transportation of drilling and exploration equipment. A good, all weather year around road would require a certain amount of realignment and rock work, but on cursory observation does not appear to be a major project.

The Canadian Pacific Railway line between Princeton and Penticton passes about 12 miles airline south of the property. Logging roads, said to be suitable for hauling, connect the Brenda area and the railway, traversing a distance of about 15 miles.

HISTORY - PREVIOUS REPORTS AND DATA

The presence of copper-molybdenum mineralization in the area now called the Brenda Prospect has been known for many years. In Memoir 243 of the Mines and Geology Branch of the Canada Department of Mines and Resources titled GEOLOGY AND MINERAL DEPOSITS OF THE PRINCETON MAP AREA, BRITISH COLUMBIA (1947), H. M. A. Rice describes mineralization on the property then known as the Copper King Group and suggests "the possibility of a very considerable tonnage of low grade ore..." deserving further investigation.

Work by Noranda Mines Ltd. in 1955 and 1956 and that by Northwest Explorations in 1957 was carried out in the hope of delineating a substantial body of commercial tenor. Results indicated very widespread mineralization, but grades considerably below the generally accepted threshold of profitability.

Data reviewed in preparation of this report, included the following:

1. Report on Brenda Prospect, Osoyoos Mining Division, British Columbia
 by - Charles S. Ney
 for - Northwestern Explorations Limited
 January 15, 1958
2. Drill Logs -Holes B1, B2 and B3 - Noranda Exploration Co. Ltd. - 1956
 Logs of relogging and resampling of these same holes by Kennco
 Explorations (Canada) Limited - 1957.
3. Logs of Northwestern Explorations Limited 1957 drilling - Holes PS-1
 through PS-5 and 1A+B through 35A+B.
4. Log Mutch No. 1 Drillhole - October 1962.
5. Various Maps and Plans
 - A. Noranda Explorations Co. Ltd.
 - a) Geochemical Survey 1" - 1000'
 - b) Brenda Property 1" - 1000'
 - c) Regional Geology 1" - 2640'
 - B. Northwestern Explorations Ltd.
 - a) Outcrop Distribution 1" - 400' Sept. 20, 1957
 - b) General Plan 1" - 100' Sept. 20, 1957
 - c) Self Potential Data 1" - 100' Sept. 18, 1957
 - d) Self Potential Data 1" - 400' Sept. 24, 1957
 - e) Magnetic Profiles 1" - 100' Oct. 15, 1957
 - f) Magnetic Map-Detail Area 1" - 100' Aug. 17, 1957
 - g) Magnetic Map 1" - 400' Aug. 7, 1957
 - h) Fracture Overlay 1" - 100' Jan. 4, 1958
 - i) Hornblende-Biotite Ratio 1" - 100' Jan. 4, 1958
6. B. C. Provincial 1" - 2640' Air Photographs
 BC1249:79 - 1249:94
7. G. S. C. Memoir No. 243 - 1947.

The 1956-57 field programme results indicated a large area of copper-molybdenum mineralization. These metals are present for the most part as chalcopyrite and molybdenite occurring principally in association with quartz and potassium feldspar as fracture filling. Since very little mineralization has invaded or been disseminated in the host rock, grade is largely a function of fracture density.

Tonnage and grade estimates made by Northwestern Exploration Ltd. were based on assays from three Noranda drillholes totalling 1006 feet; shallow Northwestern drillhole pairs 1, 2, 3, 7, 8, 12, 19, 20, 25, 27 and 30 totalling 561 feet; and Northwestern holes PS4 and PS5 totalling 170 feet. Figures reported by Ney for "Mineralized Area B" shown on the 1" - 100' General Plan are 175,000 tons per vertical foot grading 0.21% Cu and 0.03% Mo. Ney concluded that the grade was too low for economic consideration.

TITLE

No examination of ownership or expiry dates of claims or validity of title was made during our evaluation of the Brenda Prospect.

GEOLOGY

The regional geology of the Brenda Lake area and a detailed geological study of the Brenda Property are described in the Ney report. Our inspection of the prospect was entirely within the boundaries of "Mineralized Area B" where geologic conditions were exactly as described in this report. Among the important factors confirmed by visual inspection were:

1. The rock in the area examined is granitic in texture and probably granodiorite in composition. The rock is remarkably fresh and unaltered and appears to contain a higher percentage of mafics, principally in hornblende and biotite, than is common in the coast intrusions of southern British Columbia.

2. Mineralization in the form of chalcopyrite and molybdenite occurs almost entirely as fracture filling associated with quartz and potassium feldspar. No sulphide grains were observed more than a few millimeters from fracture walls.

3. The fractures are generally narrow, steep dipping and apparently quite persistent in both horizontal and vertical directions.

4. Fracturing in the area observed had been moderate to intense with frequency ranging from about five to more than twenty per yard.

Three principal strike directions were noted:

1. N55° - 75°E
2. N0° - 10°E
3. N45° - 60°W

The first set appears to be the most persistent and the most intimately associated with mineralization. There is little evidence of horizontal movement and little to no offset of fracture intersections.

5. Oxidation is apparently very shallow. Some brown to maroon staining along fractures, minor development of malachite and a few spots of molybdenite were observed, but there is no evidence of extensive alteration, weathering or breakdown of sulphide minerals.

EVALUATION OF EARLIER WORK

There seems no reason to doubt that work done at the Brenda Prospect during 1956 and 1957 was of excellent quality performed by highly competent engineers and geologists. However, it is proper to examine the results critically to determine whether or not they provide sufficient information to permit valid projections of grade potential for a mineralized body of this size.

In the drilling of deposits in which values are largely, if not entirely, on thin fracture planes; core assays are frequently 10 to 20% lower than the grade of the material drilled even when core recovery is good to excellent. The core tends to break along fractures and a portion of the values are washed out. Therefore, the Brenda drilling results may be low by an unknown amount.

In only a very small portion of the mineralized area has any testing been done for more than a few feet below the surface. Noranda drillholes B-1 (340'), B-2 (332') and B-3 (334') are considered to indicate the grade potential for "Mineralized Block A", the designation used by Northwestern Explorations to describe a 600 x 1000 foot block including these holes. Four Northwestern shallow drillhole pairs (1A&B, 2A&B, 3A&B and 7A&B) were also put down in this block. The following table shows a comparison between assay averages for the total lengths of the Noranda holes, for the upper portions for these same holes, and for the Northwestern shallow holes.

ASSAY AVERAGE COMPARISON - MINERALIZED AREA A
(all assays used are from Northwestern Exploration Logs)

Drillhole	Interval Feet	Assay Averages	
		Cu%	Mo%
Brenda 1	0 - 340	0.227	0.045
Brenda 2	0 - 332	0.298	0.077
Brenda 3	0 - 334	0.157	0.030
Arithmetic Avg.		0.227	0.051
Brenda 1	0 - 40	0.15	0.01
Brenda 2	0 - 40	0.20	0.03
Brenda 3	3 - 20	0.10	0.04
Arithmetic Avg.		0.15	0.027
1A	5 - 18)	0.32	0.06
1B	5 - 20)		
2A	5 - 20)	0.25	0.02
2B	5 - 20)		
3A	5 - 20)	0.15	0.01
3B	5 - 20)		
7A	5 - 20)	0.14	0.01
7B	5 - 20)		
Arithmetic Avg.		0.215	0.025

The upper portion of the Brenda "deep" holes are 33.9% lower in copper and 47% lower in Mo. than the total Brenda holes. The "shallow" hole pairs are 5.3% lower in copper and 51% lower in Mo. than the total Brenda holes. These figures suggest that the top fifty feet of the mineralized area may be considerably lower in metal content than the deeper portion of the deposit. If this is true, the "shallow" holes on which most grade potential projections have been based are not valid criteria for such projections.

MINIMUM TARGET

To evaluate a deposit such as the Brenda, it is desirable to determine the minimum target which would provide adequate returns on the very large investment required and to then investigate the probability of the presence of such a target in relation to the cost of determining whether or not it does in fact exist.

J. B. Evans of the C. W. & G. Ltd. staff has made a study of the tonnage and grade requirements at various production rates using assumed but realistic metal prices, recovery rates and production costs to provide return of capital and profit at the rate of 10% per annum on outstanding invested funds. His findings appear in Appendix A and are summarized below:

MINIMUM REQUIREMENTS FOR PROFITABLE OPERATION AT VARIOUS PRODUCTION RATES

Metal Prices -

Cu - 32¢/lb.

Mo - \$1.55/lb.

1. At 10,000 tons per day.

- a) Reserves 70,000,000 tons - stripping ratio less than 1 to 1
- b) Recoverable value in excess of \$2.50/ton milled
- c) Geological grades (0.30%Cu + 0.08%Mo.) to
(0.35%Cu + 0.07%Mo.)
- d) Mill recoveries: Cu better than 85%
Mo better than 70%
- e) \$26,500,000 Capital available.

2. At 20,000 tons per day

- a) Reserves 140,000,000 tons - stripping ratio less than 1 to 1
- b) Recoverable value in excess of \$2.10/ton milled
- c) Geological grades (0.26% Cu + 0.07% Mo) to
(0.30% Cu + 0.06% Mo)
- d) Mill recoveries: Cu better than 80%
Mo better than 65%
- e) \$40,000,000 Capital available

3. At 40,000 tons per day

- a) Reserves 280,000,000 tons - stripping ratio less than 1 to 1
- b) Recoverable value in excess of \$1.90/ton milled
- c) Geological grades (0.25% Cu + 0.06% Mo) to
(0.29% Cu + 0.05% Mo)
- d) Mill recoveries: Cu better than 80%
Mo better than 65%
- e) \$65,000,000 Capital available.

CONCLUSIONS

Grades suggested by earlier preliminary and inconclusive work on the Brenda Prospect are considerably lower than the minimums which we estimate would be required for profitable large scale operation. However, as pointed out earlier, indicated results may be lower than actual grades. Additionally discrepancies in assay results lead to some doubt on the validity of grade averages. On the three Noranda holes (Brenda 1, 2 and 3), Noranda evaluation of one half of the split core averaged 0.258% Cu. Northwestern assays on the balance of the core averaged 0.227% Cu, or 12% lower. Noranda did not have enough molybdenum determinations made to permit meaningful comparison of Mo. assays.

For Northwestern Explorations shallow holes assays for 44 out of 73 samples were assayed by two laboratories listed as "Eldridge or Denver" and "Sudbury". The Sudbury results on Mo averaged 7.3 times the Eldridge or Denver assays. Only the latter were used in grade estimation.

Numerous checks on molybdenum assays were conducted by Noranda in which duplicates of pulps analyzed by the Vancouver commercial laboratory which had done the assaying on Noranda's Brenda samples were assayed in

Noranda laboratories in Vancouver and Quebec. On average, Noranda Vancouver was 42% higher and Noranda Quebec was 52.3% higher than the commercial laboratory.

These results do not prove that the grade estimates made on the Brenda prospect are necessarily low. They do indicate to us that the potential grade of the deposit is at present undetermined.

Results of semi-detailed study of air photographs covering the Brenda prospect showed moderate to intense fracturing throughout the area with a concentration in Northwestern "Mineral Area B" and an even more dense fracture pattern to the north traversing a strong fault zone between MacDonald and Long Lakes (see overlay for Noranda 1" - 100' Geochemical Plan). This area is briefly mentioned in the Ney report, is covered by the Northwestern 1" - 400' Outcrop Distribution Plan and is for the most part west of the line shown by Northwestern to be the western limit of mineralization. It is not covered by the geophysical or geochemical surveys reported to us. Since mineralization is a function of fracture density in the zones of known interest, this area merits further attention.

A careful analysis of all of the data available to us leads to the following conclusions:

1. The tonnage potential at the Brenda Prospect is very large, ranging from several hundred million to over a billion tons.
2. The grade in copper and molybdenum is probably quite low, but might be sufficient to permit profitable large scale operation at current prices for metals.
3. Drill results and study of fracture patterns suggest the possible presence of zones of local concentration of sufficient size to substantially enhance the feasibility of a large scale operation.

4. The cost of delineating, developing and determining the grade of sufficient tonnage to justify an operation in the 20 to 40 thousand ton per day range would probably be from 3 to 7 million dollars. Such an expenditure is not warranted on the basis of present information.

5. A preliminary programme designed to check the accuracy of previous drill results, evaluate percussion drilling as a tool for further exploration and development work at the property, provide a better base for estimation of grade potential and to investigate the possibility of mineral concentration in the densely fractured area observed on air photographs could be carried out at comparatively moderate cost. Such a programme is thoroughly justified in our opinion.

6. Target grades presented are absolute minimums at present metal prices which many authorities consider to be high. Metallurgical recoveries assumed may be high for such low grade material. To constitute an attractive economic target, grades should probably be 20% higher than our calculated minimums.

RECOMMENDATIONS

The following programme is recommended to obtain the objectives set forth in paragraph 5 under Conclusions.

1. Field reconnaissance of the highly fractured area noted on air photographs. If observations confirm the dense fracture pattern, the geochemistry grid should be expanded to cover it. The baseline should be extended to a point 2500 feet north of the northernmost cross (E-W) line shown on the Noranda 1" - 1000' geochemical plan and three new crosslines, each approximately 5000 feet in length, run parallel to the old grid at points 500', 1500' and 2500' north of the northernmost line mentioned above.

2. Recent experience with comparatively new combination rotary and percussion drills using large diameter bits and detergent mist to prevent

dust loss and coagulate cuttings samples has indicated that the use of this tool and technique can often produce more representative samples at considerably lower costs than can be obtained by diamond drilling. We recommend that three percussion drill holes be put down at the Brenda Prospect. We suggest that these holes be collared at the collar positions of Noranda Holes 1, 2 and 3, be parallel to these holes in bearing and to be drilled at an inclination of -60° . Samples should be collected at 10 foot intervals. Each hole should go to a depth of 200'.

3. To give a basis for comparison between diamond drill results, percussion drill results and the actual grade of the ground in place, we recommend that a shaft be sunk to a depth of 50 feet along the course of the percussion hole at hole B-2 location. All muck from each round should be crushed and split down to standard sample size for assaying. Rejects should be carefully stored as a source of material for preliminary metallurgical test work.

4. When the above work has been completed, the results should be studied and the potential of the Brenda Prospect re-evaluated.

Estimated costs of the recommended program are tabulated below:

Geochem - 3 lines @ 1000' centres = 15,000 feet + 2000 feet baseline 3.2 miles - 177 samples	\$1,000.00
Percussion drilling 600' @ \$6	3,600.00
Shaft 50' - 4' x 4' @ \$200/Ft. (includes A frame and rental hoist)	10,000.00
Bulk sampling - includes bins, rental crusher, metal sheets, labour, 16 four ton rounds reduced to 50 lbs. samples @ - 3/8"	5,000.00

Assaying 100 Samples Cu & Mo	700.00
Check Assaying	500.00
Supervision	1,500.00
Camp 12 men 45 days	1,500.00
Transportation	1,200.00
Evaluation & Contingency	5,000.00
	<hr/>
TOTAL	\$30,000.00

APPENDIX

OPEN PIT MINING AND SULPHIDE FLOTATION MILLING

SOUTH CENTRAL B.C.

Findings:

1. Minimum requirements for 40,000 T.P.D. operations are
 - a) 280,000,000 tons of ore, stripping ratio less than 1:1.
 - b) Recoverable value in excess of \$1.90/ton milled.
 - c) Geol. Grades: 0.25 - 0.30% Cu
0.05 - 0.06% Mo
 - d) Mill Recoveries: Cu better than 80%
Mo better than 65%
 - e) \$65,000,000 Capital available.

2. Minimum requirements for 10,000 T.P.D. operations are
 - a) 70,000,000 tons of ore; stripping ratio less than 1:1.
 - b) Recoverable value in excess of \$2.50/ton milled.
 - c) Geol. Grades: 0.30 - 0.35% Cu
0.07 - 0.08% Mo
 - d) Mill Recoveries: Cu better than 85%
Mo better than 70%
 - e) \$26,500,000 Capital available.

J. B. Evans

27 October 1964

OPEN PIT MINING AND SULPHIDE FLOTATION MILLING.

SOUTH CENTRAL B. C.

CAPITAL COST ESTIMATES

1. Nominal Milling Rate - 10,000 T. P. D.

- A. Pit Equipment, assuming 1:1 stripping ratio.
10,000 T. P. D. milling rate is equivalent to approximately 30,000 total T. P. D. mining on 5 day per week basis.

	<u>Capital Cost</u>
Shovels - 5 yd. shovel at 6,000 T per shovel shift require 5 shovel shifts per day. On 2 shift operation require 3 shovels 3 shovels at \$250,000	\$ 750,000
Trucks - 5 trucks per shovel (including spares) 35 - 45 T capacity at \$75,000	1,125,000
Drills - assume 3 x 40 R's or equivalent at \$125,000	375,000
Tractors - 4 at \$60,000	240,000
Graders - 2 at \$25,000	50,000
Electrical Distribution around pit - 10 miles at \$10,000	100,000
Ancillary equipment - pickups, service vehicles	60,000
Incidental equipment and contingency	<u>300,000</u>
TOTAL PIT	\$3,000,000

B. Milling

Crushing - Primary 42-48" Gyrotory	\$1,000,000
Conveyors and Stockpile	500,000
Secondary and Tertiary Crushers	1,500,000
Mill - Fine Ore Storage	1,000,000
Grinding	5,000,000
Flotation (2 products)	2,000,000
Filtering and Conc. Storage	<u>1,000,000</u>
TOTAL MILLING	\$12,000,000

Carried Forward \$15,000,000

C. Surface Plant

Administration Office	\$150,000	
Pit Shop	300,000	
Service Shops and Warehouse	400,000	
Electrical Distribution	400,000	
Water Supply	200,000	
Tailing Disposal	250,000	
Access Roads	140,000	
Senior Staff Housing	<u>160,000</u>	

TOTAL SURFACE PLANT 2,000,000

D. Pre Production

Delineation	1 - 2,000,000	
Stripping	2 - 4,000,000	3 - 6,000,000

E. Initial Operating

3 mo. operating at \$2.00/ton	2,000,000
-------------------------------	-----------

F. Possible Additional Expense

Power Supply 12,500 KW at \$200/Kw	2,500,000
Townsite	<u>500,000</u>

TOTAL CAPITAL EXPENDITURE \$25 -28,000,000

2. Nominal Milling Rate - 20,000 T.P.D.

	<u>Range of Cost</u>
A. Pit Equipment	\$ 5 - 6,000,000
B. Milling	18 - 20,000,000
C. Surface Plant	2 - 3,000,000
D. Pre Production	3 - 6,000,000
E. Initial Operating	2 - 3,000,000
F. Possible Additional Expense	<u>4 - 8,000,000</u>

TOTAL CAPITAL EXPENDITURE \$34 - 46,000,000

3. Nominal Milling Rate - 40,000 T.P.D.

	<u>Range of Cost</u>
A. Pit Equipment	\$ 8 - 10,000,000
B. Milling	30 - 35,000,000
C. Surface Plant	3 - 5,000,000
D. Pre Production	4 - 7,000,000
E. Initial Operating	3 - 5,000,000
F. Possible Additional Expense	<u>9 - 11,000,000</u>

TOTAL CAPITAL EXPENDITURE \$57 - 73,000,000

REQUIRED MINIMUM OPERATING PROFIT FOR 20 YEAR LIFE

Basis: Canadian Tax Structure applicable
 Require return of total capital expenditure plus
 10% annual return on outstanding investment
 The above resolves to an average Annual Net
 Cash Flow equal to 1/8 of total capital expenditure

	<u>10,000 TPD</u>	<u>20,000 TPD</u>	<u>40,000 TPD</u>
Minimum Annual Operating Profit Unit = \$1,000,000	2.9 - 3.5	4.25 - 5.75	7.13 - 9.13
Minimum Operating Profit per Ton Milled Unit = \$/ton	0.80 - 1.00	0.60 - 0.80	0.50 - 0.65

ESTIMATED OPERATING COSTS/TON MILLED

	<u>10,000 TPD</u>	<u>20,000 TPD</u>	<u>40,000 TPD</u>
Mining (1:1 Stripping Ratio)	40 - 50¢	35 - 45¢	35 - 45¢
Milling	60 - 75	55 - 65	55 - 60
Overhead	<u>40 - 50</u>	<u>35 - 45</u>	<u>25 - 40</u>
Range of Estimated Operating Costs/ton Milled	\$1.40 - \$1.75	\$1.25 - \$1.55	\$1.15 - \$1.45

TOTAL MINIMUM NET RETURN/TON MILLED

	<u>10,000 TPD</u>	<u>20,000 TPD</u>	<u>40,000 TPD</u>
	\$2.20 - \$2.75	\$1.85 - \$2.35	\$1.65 - \$2.10

EXAMPLES

1. Take 0.25% Cu 0.05% Mo

Mine Dilution 10%

	<u>Cu</u>	<u>Mo</u>
Mill Recoveries	85%	65%
Selling Prices	32¢/lb.	\$1.55/lb.
Values	96¢	87¢

Total Value = \$1.83/ton mill feed

2. Take 0.25% Cu 0.05% Mo

Mine Dilution 15%

	<u>Cu</u>	<u>Mo</u>
Mill Recoveries	80%	50%
Selling Prices	30¢/lb.	\$1.55/lb.
Values	78¢	64¢

Total Value = \$1.42/ton mill feed

3. Take 0.30% Cu 0.07% Mo

Mine Dilution 10%

	<u>Cu</u>	<u>Mo</u>
Mill Recoveries	85%	65%
Selling Prices	32¢/lb.	\$1.55/lb.
Values	\$1.14	\$1.23

Total Value = \$2.37/ton mill feed

4. Take 0.30% Cu 0.07% Mo

Mine Dilution 15%

	<u>Cu</u>	<u>Mo</u>
Mill Recoveries	80%	50%
Selling Prices	30¢/lb.	\$1.55/lb.
Values	94¢	89¢

Total Value = \$1.83/ton mill feed

JUN 27 1962

KER

File 82 E

82 E

Back to
Pete's
copy

A	N
	W.S.R.
	K.C.G.
	P.M.K. ✓
	C.K.W.
	G.H.M.
	R.D.S.
	B.C.B.
	D.W.P.
	G.P.R.
	E.L.D.
	J.B.
	(E.C.)

To..... P. M. KAVANA

Velvet mine Rossland BC

Subject..... VELVET MINE,

26th, 1962.

June 26 1962

Mr. J. C. Urquhart
ROSSLAND, B.C.

VELVET MINE, Rossland Area.

Dear Mr. Urquhart:

I have, this day, advised Mr. J. C. Urquhart that the potential of the Velvet Mine is, in my opinion, too limited to justify our participation. This opinion arises from a perusal of data which I received this morning from the property owners. The synclinal, or bowl-shaped structure on the 7th level may yield more ore, but the tonnage would in all probability be limited. The drilling results below the 7th level must have been negative, or nearly so, because no records seem to have been kept. Even if a substantial tonnage of ore were found from developments both North and South of the synclinal ore body, the grade is too low to yield anything but the slimmest marginal profit even if the mill were operated at it's maximum capacity of 150 tons per day.

It is necessary for an intelligent appraisal of the mine. In particular, I would have to know what drilling had been done and the results were. The copies of the maps that C. H. & S. have made of a geological legend and are not very helpful.

WMS

William M. Sirola.

In reply to your question about whether a 24' sample was representative, I would have to say that it depends in your area on the mining width and on the persistence of that grade. At Cowpound where the veinbody is 150' wide, it was certainly representative. If your mining width turned out to be 24', then it would not be so.

The South end of the ore (?) you have been mining did not have such vertical persistence and I do not know that you could count on such wide persistence on the North end. How far the mineralization would extend Northwest is anybody's guess. The greater thickness of ore (?) encountered on the 7th level appears to be the result of a fold and these thicknesses could not be counted on above or below that structure.

WMS:rl

JUN 27 1962

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

82 E
attach to
predecessor's
corresp

A	N
	W.S.R.
	K.C.G.
	P.M.K. ✓
	C.K.W.
	G.H.M.
	R.D.S.
	B.C.B.
	D.W.P.
	G.P.R.
	E.L.D.
	J.L.B.
	(E.C.)

To..... P. M. KAVANAGH From..... W. M. SIROLA

Subject..... VELVET MINE, ROSSLAND, B.C. Date..... June 26th, 1962.

I have, this day, advised Mr. J. C. Urquhart that the potential of the Velvet Mine is, in my opinion, too limited to justify our participation. This opinion arises from a perusal of data which I received this morning from the property owners. The synclinal, or bowl-shaped structure on the 7th level may yield more ore, but the tonnage would in all probability be limited. The drilling results below the 7th level must have been negative, or nearly so, because no records seem to have been kept. Even if a substantial tonnage of ore were found from developments both North and South of the synclinal ore body, the grade is too low to yield anything but the slimmest marginal profit even if the mill were operated at it's maximum capacity of 150 tons per day.

RL

pp. William M. Sirola.

WMS:rl

82/E

319
xxx

May 22nd, 1962.

A	N
	W.S.R.
	K.C.G.
✓	P.M.K. ✓
	C.K.W.
	G.H.W.
	R.D.S.
	B.C.B.
	D.W.P.
	C.P.X.
	E.L.L.
	A.S.
	<u>E.C.J.</u>

Mr. J. C. Urquhart,
ROSSLAND, B. C.

VELVET MINE, Rossland Area,
B.C.

Dear Mr. Urquhart:

I have not been able to give Kerr-Addison or yourself a final decision because I do not feel I have a sufficiently comprehensive picture of what has happened at The Velvet Mine in the past. I know, for example, that the mining done by Midwest was too low-grade to be economic, but I do not know where all their mining was done; I do not know if they did any surface geological mapping or geophysical work. I do not know whether it would be possible for us to deal with Midwest when your lease expires. Their President, Mr. Shaw, has agreed to send me their data but I am not entirely convinced that he will do so - he did not appear to be very interested. I am sure that there are legible underground maps prepared by Harvey Cohen, and perhaps others, and these are necessary for an intelligent appraisal of the property. In particular, I would have to know what drilling had been done and what the results were. The copies of the maps that C. M. & S. had are devoid of a geological legend and are not very helpful.

In reply to your question about whether a 2% copper ore is economic, I would have to say that it depends in your case on the mining width and on the persistence of that grade. At Craigmont where the orebody is 100' wide, it most certainly is economic. If your average width turned out to be 5', then it would not be so.

The South end of the ore (?) you have been mining did not have much vertical persistence and I do not know that you could count on much more persistence on the North end. How far the mineralization would extend Northward is anybody's guess. The greater thickness of ore (?) encountered on the 7th level appears to be the result of a fold and these thicknesses could not be counted on above or below that structure.

Mr. J. C. Urquhart

- 2 -

May 22nd, 1962.

I will advise you as soon as possible regarding our
decision.

Regards,

Yours truly,

KERR-ADDISON GOLD MINES LIMITED



pf. William M. Sirola.

c.c. Dr. P. M. Kavanagh

WMS:rl

MAY 22 1962

KERR-ADDISON GOLD MINES LIMITED

(FOR INTER-OFFICE USE ONLY)

82/E

A	
W.S.R.	
K.C.G.	
P.M.K.	✓
G.H.M.	
R.D.S.	
D.W.P.	
G.P.P.	
E.L.D.	
J.L.B.	
E.C.J.	

To P. M. KAVANAGH From W. M. SIROLA

Subject THE VELVET MINE, ROSSLAND, B.C., 82-E, TRAIL CREEK MINING DIVISION. Date May 17th, 1962.

If, and when, I can obtain illustrative maps of The Velvet Mine, I will send them on to you. I am afraid I have nothing at the moment that would be of much help.

R.L.

pp. William M. Sirola.

WMS:rl

MAY 22 1962

82/E

KERR-ADDISON GOLD MINES LIMITED

SUITE 1600 - BANK OF NOVA SCOTIA BUILDING
44 KING STREET WEST
TORONTO 1, ONTARIO

319
ROOM 306- U. K. BUILDING
GRANVILLE AND HASTINGS STREETS
VANCOUVER, B.C.

A
M
P
C
R
B
D
G
E
J
K

TO: DR. P. M. KAVANAGH

FROM: WILLIAM M. SIROLA

DATE: MAY 17th, 1962.

SUBJECT: THE VELVET MINE
Rossland, B. C.
82-E
Trail Creek Mining Division

On May 9th and 10th, I examined the property known as The Velvet Mine located approximately 9 miles southwest of Rossland on the Cascade Highway. The examination was prompted by a telephone call from Ed. Lovitt who apparently had been visited by Mr. J. C. Urquhart, who is currently leasing the mine from Midwest Copper and Uranium Mines Ltd. As a result of his discourses with Urquhart, Lovitt appeared to feel that the property had merit and dwelt at some length on the widths of ore on the bottom levels, and on the fact that the property is equipped with a relatively new mill. You will appreciate that this latter feature would loom rather large in Ed's thinking.

Urquhart and his partners are in trouble. They need the sum of \$15,000.00, with which they would carry-out development work on the bottom level and put new liners in the ball mill. If they do not get the money their lease will probably revert to the owners within a period of four months. Theoretically, the lease does not expire until May 15th, 1966.

Urquhart and partners have shipped 13,146 tons to the Tacoma Smelter since June 18th, 1960. The net smelter return from these shipments was \$136,255.87, or an average of \$10.35 per ton. The term "net smelter" is used here as the payment made to the leaser's after deducting haulage, smelter charges and royalties. If we deduct \$3.00 for milling, there remains only \$7.35 per ton to pay for mining, general overhead, depreciation etc. In my opinion, there is no marginal profit under these circumstances. I am sure the leaser's would agree with me on that score. It would appear to me that a very substantial increase in milling rate would be required to make a profit from the sort of grade the leaser's have been handling. Much depends/

May 17th, 1962.

depends, of course, on the average width of the ore. In the upper part of the mine, the Velvet vein was probably 2' - 3' wide, but produced a net smelter return of approximately \$15.00 per ton in terms of today's metal prices. On the seventh level where the current leaser's have been mining, widths have been considerably better (6' - 15'). These widths are, however, caused by a synclinal fold and would not be representative in any prolonged operation. A representative width might be 5' or even less.

The leaser's have opened a 70' length between the sixth and seventh levels which is open on the north end and which, on the basis of drill cuttings, averages 2% copper and perhaps \$3.00 gold. This ore could extend for some distance upward but judging by past experience, probably not downward. Without adequate maps and reports on past operations, about all that can be said of this mineralization is that it has some possibility of developing into a minable ore shoot. If we chose to be optimistic, we could give it dimensions of 300' x 300' x 5'. This would provide 55,000 tons, using a tonnage factor of 8 because of the heavy sulphide content. The 150-ton mill on the property would consume this tonnage in one year.

Since the ore on the bottom levels is quite magnetic, it is possible that surface magnetic work would provide some idea of the extent of the mineralization to the north of the present face. I do not know if such work was ever done and I have not, as yet, been able to obtain the records of Midwest Copper and Uranium to see what work they carried out. Dr. Pentland was in charge and I believe he is in New Zealand. The ore in the upper levels of the mine was non-magnetic and consequently mining there may have been done on a different vein. By the same token, the metal ratios in the vein may have changed between the top and the bottom of the mine.

Published production from the mine to 1943 amounted to 58,000 tons containing 0.294 ozs. of gold and 1.35% copper. Urquhart advises that in the period 1939 - 1943, when the property was under lease, \$500,000 worth of ore were shipped in Tacoma - he claims to have got this figure from the Tacoma Smelter people. In the interval 1955 - 1960 Midwest had the property and made the following shipments: 21,843 tons averaging 0.078 Au and 1.1% Cu. They could not possibly have made any money at those figures except from the Stock Market.

CONCLUSIONS:

Only the mined-out upper part of the mine was sufficiently high-grade to be minable at a profit.

It/

May 17th, 1962.

It would be a comparatively easy matter to continue development northward of the mineralization between the sixth and seventh levels. Were such a move undertaken, it would have to be done in the hope that the mineralization encountered would be higher grade than that which currently exists on the mine. It is not really possible to accurately state the probable potential of this property without access to previous geological data. The higher gold values in the upper workings could easily be related to some geologic feature of which we have no knowledge at present.

No further work is recommended until existing geological reports can be studied. On the basis of past performance, the outlook would not appear to be too bright but it should not be dismissed entirely.

R. J. Sirola

p.p. William M. Sirola.