

PRODUCTIONPIONEER

		<u>Au</u>	<u>Ag</u>
1908-53	1,876,251 T.	1,011,959 oz.	178,413 oz.
1954-62	<u>600,442 T.</u>	<u>321,124 oz.</u>	<u>66,235 oz.</u>
	<u>2,476,693 T.</u>	<u>1,333,083 oz.</u>	<u>244,648 oz.</u>

$$\text{Therefore, grade} = \frac{1,333,083}{2,476,693} = \underline{0.538 \text{ oz./T.}}$$

BRALORNE

1900-53	3,175,497 T.	1,550,119 oz.	448,457 oz.
1954-64	1,671,710	965,854	201,872
-65	115,731	54,589	10,666
-66	105,813	43,222	8,269
-67	97,332	48,711	8,652
-68	100,660	52,324	9,352
-69	94,396	46,896	8,275
-70	76,817	39,300	6,813
-71	<u>36,282</u>	<u>20,021</u>	<u>3,506</u>
	<u>5,474,238 T.</u>	<u>2,821,036 oz.</u>	<u>705,862 oz.</u>

$$\text{Therefore, grade} = \frac{2,821,036}{5,474,238} = 0.515 \text{ oz./T.}$$

Combined:

- Tons - 7,950,931
 Au oz - 4,154,119
 Grade - 0.5225 oz/ton
 Ag oz. - 950,510
 Grade - 0.1195 oz/ton

C.R.L.

77/53
51/55

RECOMMENDED PRELIMINARY
EXPLORATION PROGRAM

There were 4 veins that contributed 4 million tons of Bralorne's 5,500,000 tons production:

77	-	2,100,000 T.
51	-	1,075,000 T.
53 (faulted segment of '77'?)	-	520,000 T.
55 " " " '51'?	-	330,000 T.

*Paul: develop
mining on 51 vein
+ term in when 77
was discovered*

*not shown in
100 sc. 2 v. 10,*

The 55 vein was weak on 20 level, similarly on 24 level. The 53 vein contained short shoots of ore on the 20 level, was split on the 24 level. Neither of these veins is considered to have prime potential below the 24 level.

*lower priority
to explain of
53 + 55 veins*

*Current
priority is
77 + 51*

The exploration program recommended herein is directed largely to finding more ore in the '77' and '51' vein structures, and to a lesser extent in a search for new veins. Exploration between Bralorne and the King has been reviewed and is not considered favourably.

The program outlined below is largely a drilling program and, in addition, provision is allowed for at least 1000 feet of drifting in the upper mine where interesting drill intersections are obtained.

LOWER MINE

The objective is to develop tonnage on the 77 vein and, to a lesser extent, to explore the hangingwall and footwall of the 77 for other veins.

Drill from the 43 level - 79 station — *check on Jack re loc'n 79 Sta*

1300 feet plan

1. Drill a 5-hole fan of -60° holes to intersect the 77 vein at a depth of 400 feet below the 4577 decline. Allow additional 2500 ft. for wedging these holes to provide further vein intersections.

Should this drilling outline an ore shoot in depth similar to that on the 4577 decline ($6.8^{\circ} \times 530^{\circ}$), the new probable ore outlined would be 120,000 tons, with a further possible 30,000 tons, making a total of 150,000 tons in both categories - to a depth of 500 feet below the 4577 decline.

Footage - 8000 feet.

2. (1) Test E end of 77 vein with a 500 ft. flat hole to a point 100 feet E (beyond) the drift face.
- (2) If (1) is successful, drill 600 ft. up-hole above (1) - $+25^{\circ}$.
- (3) If (1) is successful, drill 600 ft. down-hole below (1) - -25° .

Footage - 1700 feet.

3. Drill 2 flat holes from 79 station south to investigate stringers cut in shaft XC - 103?

Footage - 400 feet.

4. Drill long flat hole S from shaft area towards the serpentine, looking for vein(s) in the footwall of 77-79 system.

Footage - 2000 ft.

5. Drill long (?) flat hole N from 77 vein drift, looking for vein(s) in the hangingwall of the 77.

Footage - 1000 feet.

Total footage, Lower Mine - 13,100 feet.

UPPER MINE

Note 2051 E Dr. & 7077 E Dr

1. Concentrate on the 51 vein, the most productive (westerly) of its ore shoots, on the levels between 20 and 26.

provide most easterly penetration of potential drill (LVD) section

Do this by diamond drilling flat holes from existing

workings, and by drifting on best indications.

20' currently reaches SE (or near 14' E per 100' scale) currently reaches 2W.

go thru in Jack re. approx gen. skets

21 level	-	9 holes	(100' spacing)	-	2500 ft.
22 "	"	8 "	200' "	"	1970 "
23 "	"	13 "	100' "	"	2970 "
24 "	"	10 "	200' "	"	2670 "
25 "	"	9 "	100' "	"	1750

Total 11,860 ft.

Drifting 1,000 ft.

2. 51 vein, 16 level. At the far east end of the level there is an

ore shoot, 4.5' x 450' - 0.68 oz. Au/T. It has been mined above

the level but not below. It could be mined without drifting, i.e.,

ramp down on it - or could be drilled first from a XC driven 150 feet into the hangingwall.

check in Jack C. Ventilation Access

600'

13201

banded
caprock too deep like 77Vn

This is good
vein according to that
strong & texturally
similar to 77Vn
others not banded,
92, in contact with
note banded Vn make
most reliable drill
targets.

3. 52 vein, shoots located at the east end of 20 level and 26 level.

On 20 level - 5.8' x 240' - 0.55 oz. Au/T. Already

mined to the 19 level and then raised upon to the 18.

On 26 level - 4.2' x 100' - 0.51 oz. Au/T. Only the

sill was taken down.

The 52 vein could be ramped down from the 20 level and possibly drilling could be undertaken between the 26 and 20 levels, from the 26. This would entail some crosscutting south from 2652 Dr. E to get in position for drilling - say about 300 feet of crosscutting.

RECOMMENDATIONS

	<u>Drifting</u>	<u>X-Cutting</u>	<u>Diamond Drilling</u>
Lower mine			13,100 ft.
Upper mine	1000 ft.	450 ft.	<u>11,860</u> ft.
			24,960 ft.

CFL

June 29th, 1973.

Mr. F.W. Fitzpatrick, President,
Bralorne Resources Limited,
1005 - 555 Burrard St.,
Vancouver, 1, B.C.

Dear Mr. Fitzpatrick:

Herewith please find attached a memorandum concerning my conversations with Dr. F.R. Joubin on June 26th and 27th, 1973.

Yours very truly,

BACON & CROWHURST LTD.

J.J. Crowhurst

JJC/ic
Encl.

cc: W.R. Bacon
J. Thomson

June 27th, 1973.

INTERVIEW WITH DR. FRANC. R. JOUBIN
re BRALORNE MINE, BRIDGE RIVER, B.C.

On June 26th from 11:00 a.m. to 12:00 noon and on June 27th from 9:00 to 11:00 a.m. I discussed the exploration possibilities at Bralorne with Dr. Joubin in the Bralorne office.

Dr. Joubin reviewed the two Dr. D.D. Campbell reports and made the following comments:

(1) Dr. Joubin agreed that the Cadwallader Fault structure was probably one of the best known in Canada at the present time for the discovery of economic gold of quartz vein occurrence. This observation was based on past performance and general geological conditions. Dr. Joubin pointed out that the general favourable environment could very likely extend some miles to the southwest ^{east} and that the same association of rocks present at Bralorne-Pioneer occurred again at McGillivray some 20 miles away to the southwest ^{east}. He suggested, as a sideline, that Bralorne should probably think in terms of reviewing all existing data about other mines in the district situated in this general direction.

(2) Dr. Joubin agreed that Dr. Campbell's recommendation concerning exploration above the 8 level at Bralorne was probably okay as a first approach, since it was relatively inexpensive, but that the main target should be below 8 level and, more particularly, at extreme depths in the various mines. *if not blanked out by soda granite*

He outlined his views as to the general rock structure consisting of the Fergusson over-thrust sediments dipping to the northeast

note

and the Cadwallader serpentine fault zone dipping to the southwest. He felt that these met and formed a peak at the Pacific Eastern property situated in the southeast part of the camp and that the "roof" was quite broad at Bralorne, i.e. ^{'peak'} much higher than the present surface, and was situated at intermediate elevations at Pioneer. He stated that while he was in the Bridge River camp, he had not actually determined the ridge at which these two structures met in terms of topography and relative elevation, but that he felt this was an important consideration in any overall geological evaluation.

(3) Dr. Joubin noted that there was an absence of appreciation in Dr. Campbell's reports of the 27 vein in the Pioneer mine and also the fact that, in his opinion, the transverse faults were important. Likewise, Dr. Joubin emphasized the ribboning structure in the quartz vein as being always associated with economic gold values. He compared it to similar conditions at Grass Valley in California and Cripple Creek in Colorado as representing continuous movement during or before mineralization.

(4) Dr. Joubin also noted that in Dr. Campbell's report there was no mention of albitite dykes which constituted the end faces of the soda-rich granites and, in his opinion, had a very close relationship to gold mineralization.

Dr. Joubin doesn't believe that the soda granites are completely unproductive. He again sited the 27 vein as an example. He also noted that there was a definite improvement in the gold content of the veins as they approached the soda granite and that the re-sealing of fractures by the albitite faces is important.

implies both granites + all faces unformable


(5) Dr. Joubin stated that core drilling of 'A' size gave extremely good results and that there was no reason to use any larger size core. Diplomatic questioning regarding poor core recovery at Bralorne did not alter this opinion.

Subsequently, Dr. Joubin touched briefly on the Bacon & Crowhurst report. He made the following comments:

(1) In principle, Dr. Joubin agreed quite strongly with the approach that the 51 vein be explored in detail on the way down through the mine and that, should sufficient ore be found, the mine could be placed in production on these discoveries. He also gave the impression that it was obvious that the 77 vein should be pursued below the present workings.

(2) Dr. Joubin again noted that there was a basic indifference to the Pioneer mine possibilities, but said that the Pioneer vein structures had, in his opinion, fallen off drastically in gold content and were undoubtedly uneconomic at the present time.

He pointed out, however, that there should be excellent exploration chances in the areas between the Pioneer and the Bralorne workings. He produced a long section, which is now in Bralorne's possession, showing the downward continuation of the 27 vein beyond the stoped areas. This was outlined by one or two diamond drill holes from the long crosscut driven out at the Bralorne 26 level elevation. He stated that the vein had been intersected and, although low values were outlined, he felt that there were good possibilities for the discovery

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of further orebodies. He marked on the map the approximate position of these drill holes and suggested that the records be searched for this information.

(3) Dr. Joubin stated that he was in no position at this time to make any comment as to the estimated costs but felt that the projected Bacon & Crowhurst costs were reasonable and probably adequate.

(4) Dr. Joubin said that, in his opinion, the ore predictions were also reasonable, based on conservatism.

(5) Dr. Joubin felt that the area between 16 level and 20 level and 51 vein should also receive attention, although he said he realized that this area was situated a long way from the Crown shaft and would probably be explored later.

currently being rehabilitated

Dr. Joubin made the following general observations:

(1) During Dr. Joubin's time at Pioneer, he had compiled general geological sections and projections over the whole camp. He suggested that these be re-examined in light of the current price of gold. He made particular reference to the possibilities toward the Pacific Eastern mine and said that, in his opinion, this area deserved further exploration. He stated that difficulties regarding unsuccessful negotiations with Noranda, who held the ground at the time that he drove the 24 Pioneer level out in this direction, curtailed to a large extent serious work.

(2) Dr. Joubin discussed the fact that the 27 vein narrowed down in the bottom of the Pioneer mine and by the time that the 24 level

elevation had been reached, the ribbon structure had disappeared and little or no gold was present. The quartz vein continued and drilling below the workings disclosed strong structural conditions probably representing thrust movement along curved surfaces producing quartz lenses.

(3) Dr. Joubin discussed exploration of the Taylor vein which was carried on very close to the surface. He personally carried out the initial work and is curious as to whether the 451 Bralorne level fully explored and delimited the ore possibilities at a later date. He said that there was some shallow high-grade erratic ore stoped during his time at Pioneer.

(4) Dr. Joubin reiterated that he felt very strongly about the genetic relation between the albitite dykes and the gold mineralization. He quoted similar conditions in Yukon-Alaska gold placer deposits. He said that the discovery of fine-grained disseminated arsenopyrite in albite dykes had always been an excellent indication of gold values close by and was always worthy of further attention.

(5) Dr. Joubin mentioned that he had written a paper for the World Geological Congress and that he had also written a paper for the Western Miner about 1942, both of which he felt contain a lot of useful information.

(6) Dr. Joubin thought that the possibility of using geo-chemistry on the surface between Pioneer and Bralorne should be considered. He said that Dr. Warren from U.B.C. had found anomalous situations there some years ago but that these had never been properly explained. A little underground work had been done in this area and Dr. Joubin himself

As red-dia
Geochem X



had drilled some holes from the surface. A tangle of parallel veins with erratic values had been discovered but he admitted that most of these values were contained in sludge samples. Some surface trenching had been done but Dr. Joubin thinks that the work has not been finished.

(7) Dr. Joubin reviewed briefly the King mine. He said that the possibilities, in his opinion, were not good in this area.

(8) Dr. Joubin noted the fact that mariposite and scheelite usually appeared at the extremities of the vein systems, and this was usually considered a bad sign for economic gold mineralization. He also pointed out the presence of sphalerite was always considered to be a good association and was invariably accompanied by the better gold values.

(9) Dr. Joubin discussed the interpretation of diamond drill results. He said that core intersections should most definitely not be relied upon for grade determinations. This corresponds exactly, of course, with the observations made by the Bralorne staff who consider that diamond drilling should be conducted for structure, chiefly the presence of quartz veins, and that the proper calculation of gold content can only be made after drifting along the veins has been completed.

In about two months time, after Dr. Bacon and Paul Weishaupt have had an opportunity to firm up a lot of exploration ideas, he would be willing to discuss the general program and perhaps offer helpful advice. It is recommended that this procedure be followed because obviously Dr. Joubin possesses a lot of experience in the area.